



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Note: cross cutting issues highlighted in red color in the syllabus

INTEGRATION OF CROSSCUTTING ISSUES TO CURRICULUM

Crosscutting issue	Code	Number
Gender	G	133
Environment and Sustainability	E & S	234
Human Values	HV	153
Professional Ethics	PE	218
Total		738



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No.	Programme	Programme code	Course	Cross Cutting Issue
1.	B. Com. Taxation	BCM5B10	Principles Of Taxation (Specialization)	PE
2.	B. Com. Taxation	BCM5B11	Indirect Taxes Law and Practice (Specialization)	PE
3.	B. Com. Taxation	BCM6B14	Income Tax Assessment (Specialization)	PE
4.	B. Com. Taxation	BCM6B15	Corporate Taxation and Tax Planning (Specialization)	PE
5.	B.Sc. Botany	BOT1C01T	Angiosperm Anatomy and Microtechnique	PE
6.	B.Sc. Botany	BOT2C02T	Cryptogams, Gymnosperms and Plant Pathology	E&S
7.	B.Sc. Botany	BOT3C03T	Morphology, Systematic Botany, Economic Botany, Plant Breeding and Horticulture	E&S
8.	B.Sc. Botany	BOT4C04T	Plant Physiology, Ecology and Genetics	E&S
9.	B.Sc. Botany	BOT2C05	Angiosperm Anatomy, Microtechnique, Cryptogams & Gymnosperms, Plant Pathology, Systematic Botany, Economic Botany, Plant Breeding, Horticulture, Plant Physiology, Plant Ecology, Genetics (Practical)	PE, E&S
10.	B. Com	BCMIB01	Business Management	PE
11.	B. Com	BCM1C01	Managerial Economics (Complimentary)	E&S
12.	B. Com	BCM2B02	Financial Accounting	PE
13.	B. Com	BCM2C02	Marketing Management	E&S
14.	B. Com	BCM3A12	Professional Business Skills	PE
15.	B. Com	BCM3B03	Business Regulations	PE
16.	B. Com	BCM3C03	Human Resources Management	HV



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17.	B. Com	BCM4A13	Entrepreneurship Development	E&S
18.	B. Com	BCM5B07	Accounting for Management	PE, E&S
19.	B. Com	BCM5B08	Business Research Methods	PE
20.	B. Com	BCM6B13	Auditing And Corporate Governance	PE
21.	B. Com	BCM6B14	Fundamentals Of Investments	PE
22.	B. Sc Chemistry	CHE4C04	Physical and Applied Chemistry	E&S
23.	B. Sc Chemistry	CHE6B12	Advanced and Applied Chemistry	E&S
24.	B. Sc Chemistry	CHE6B13(E3)	Medicinal and Environmental Chemistry	E&S
25.	M. Sc Chemistry	CHE2C07	Reaction Mechanism In Organic Chemistry	E&S
26.	M. Sc Chemistry	CHE2L04	Inorganic Chemistry Practicals- I & II	E&S
27.	M. Sc Chemistry	CHE4E06	Natural Products & Polymer Chemistry	E&S
28.	BA English Literature	ENG1B01	Introducing Literature (Core)	G, HV, E&S
29.	BA English Literature	ENG2B02	Appreciating Poetry	G, HV, E&S
30.	BA English Literature	ENG3B03	Appreciating Prose	G, HV, E&S
31.	BA English Literature	ENG3B04	English Grammar and Usage	G, HV, E&S
32.	BA English Literature	ENG4B05	Appreciating Fiction	G, HV, E&S
33.	BA English Literature	ENG4B06	Literary Criticism	G, HV, E&S
34.	BA English Literature	ENG5B07	Appreciating Drama And Theatre	G, HV, E&S
35.	BA English Literature	ENG5B08	Literary Theory	G, HV, E&S
36.	BA English Literature	ENG5B10	Indian Writing In English	G, HV, E&S
37.	BA English Literature	ENG6B11	Voices Of Women	G, HV, E&S
38.	BA English Literature	ENG6B12	Classics of World Literature	G, HV, E&S
39.	BA English Literature	ENG6B13	Film Studies	G, HV, E&S
40.	BA English Literature	ENG6B14	New Literatures In English	G, HV, E&S
41.	BA English Literature	ENG6B17	Writing For the Media	G, HV, E&S
42.	BA English Literature	ENG5D03	Appreciating Literature	G, HV, E&S



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43.	BA English Literature	JOU1(2)C0	Introduction To Communication Journalism	PE
44.	BA English Literature	JOU1(2)C02	Introduction to Electronic Media	PE
45.	BA English Literature	JOU4(3)C02	Introduction To T.V & Cinema	PE
46.	BA English Literature	JOU4(3)C01	Journalistic Practices	PE
47.	MA English Literature	ENG1C01	British Literature from Chaucer to 18th Century	G, HV, E&S
48.	MA English Literature	ENG1C02	British Literature - 19th Century	G, HV, E&S
49.	MA English Literature	ENG1C03	History Of English Language	PE
50.	MA English Literature	ENG1C04	Indian Literature in English	G, HV, E&S
51.	MA English Literature	ENG2C05	Twentieth Century British Literature Up To 1940	G, HV, E&S
52.	MA English Literature	ENG2C06	Literary Criticism and Theory – Part 1(Up to New Criticism)	G, HV, E&S
53.	MA English Literature	ENG2C07	American Literature	G, HV, E&S
54.	MA English Literature	ENG2C08	Postcolonial Writings	G, HV, E&S
55.	MA English Literature	ENG3C09	Twentieth Century British Literature Post 1940	G, HV, E&S
56.	MA English Literature	ENG3C10	Literary Criticism and Theory: Part 2	G, HV, E&S
57.	MA English Literature	ENG3E02	European Fiction in Translation	G, HV, E&S
58.	MA English Literature	ENG3E09	American Ethnic Writing	G, HV, E&S
59.	MA English Literature	ENG4C11	English Literature in the 21st Century	G, HV, E&S
60.	MA English Literature	ENG4E14	Indian English Fiction	G, HV, E&S
61.	MA English Literature	ENG4E18	Malayalam Literature in English Translation	G, HV, E&S
62.	B.Sc. Physics	PHY5D01(3)	Elementary Medical Physics	PE, E&S
63.	B.Sc. Physics	PHY5D01(1)	Non-Conventional Energy Sources	E&S
64.	B.Voc. IT	EC4A13	Entrepreneurship Development	G, PE, E&S
65.	B.Voc. IT	EC4A14	Public Health, Sanitation & Safety	E&S, HV
66.	B.Voc. IT	SDC2ME05	Microsoft Excel with VBA and Business Analytics	PE
67.	B.Voc. IT	SDC3CD10	Circuit Design for IoT with Raspberry Pi	PE



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68.	B.Voc. FPT	EC4A13	Entrepreneurship Development	G, PE, E&S
69.	B.Voc. FPT	EC4A14	Public Health, Sanitation & Safety	E&S, HV
70.	B.Voc. FPT	SDC3FS6	Food Safety, Food Laws & Packaging Technology	PE, E&S HV
71.	B.Voc. FPT	SDC5BU14	Byproduct Utilization and Waste Management	E&S ,PE
72.	BA English & History(Double Main)	ENG1B01	Introducing Literature	G, HV
73.	BA English & History(Double Main)	ENG2B02	Appreciating Poetry	G, HV, E&S
74.	BA English & History(Double Main)	ENG3B03	Appreciating Prose	G
75.	BA English & History(Double Main)	ENG6B11	Voices of Women	G
76.	BA English & History(Double Main)	ENG6B17	Writing For the Media	PE
77.	BA English & History(Double Main)	HIS4 B05	Gender Studies	G
78.	BA English & History(Double Main)	HIS6 B08	Indian History- 4 The Making of Contemporary India	E&S, PE
79.	BA Economics	ECO6B13	Development of Economic Thought	HV
80.	BA Economics	ECO6B14	Economics of Growth and Development	HV, E&S, G
81.	BA Economics	ECO6B18	Urban Economics	HV
82.	BA Economics	ECO6B11	Financial Economics	PE
83.	MA Economics	CC19PECO4E06	Agricultural Economics	E&S ,HV
84.	MA Economics	SCC19PECO1C04	Quantitative Methods for Economic Analysis	PE
85.	MA Economics	CC19PECO2C08	Quantitative Methods for Economic Analysis 11	PE
86.	M. Sc. Botany	BOT1C01	Phycology, Bryology, Pteridology And Gymnosperms	E&S



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87.	M. Sc. Botany	BOT1C02	Mycology, Lichenology, Microbiology and Plant Pathology	E&S, PE
88.	M. Sc. Botany	BOT1C03	Angiosperm Anatomy, Angiosperm Embryology, Palynology & Lab Techniques	PE
89.	M. Sc. Botany	BOT1L01	Practicals of Phycology, Bryology, Pteridology, Gymnosperms, Mycology & Lichenology	E&S
90.	M. Sc. Botany	BOT1L02	Practicals of Microbiology, Plant Pathology, Angiosperm Taxonomy, Angiosperm Embryology, Palynology & Lab Techniques	E&S, PE
91.	M. Sc. Botany	BOT2C04	Cell Biology, Molecular Biology & Biophysics	PE
92.	M. Sc. Botany	BOT2C05	Cytogenetics, Genetics, Biostatistics, Plant Breeding & Evolution	G, PE
93.	M. Sc. Botany	BOT2C06	Plant Ecology, Conservati Biology, Phytogeography & Forest Botany	E&S
94.	M. Sc. Botany	BOT2L03	Practicals of Cell Biology, Molecular Biology, Biophysics, Cytogenetics	PE
95.	M. Sc. Botany	BOT2L04	Genetics, Biostatistics, Plant Breeding, Plant Ecology, Conservation Biology, Phytogeography & Forest Botany	PE
96.	M. Sc. Botany	BOT4E02	Genetic Engineering	PE
97.	M. Sc. Botany	BOT4L07	Practicals of Environmental Biology and Biodiversity Conservation & Genetic Engineering	E&S, PE
98.	M. Sc. Botany	BOT3C09	Biotechnology and Bioinformatics	PE



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99.	M. Sc. Botany	BOT3L05	Practicals of Plant Physiology, Metabolism, Biochemistry, Angiosperm Morphology, And Taxonomy	E&S
100.	M. Sc. Botany	BOT3L06	Practicals of Plant Resources, Biotechnology and Bioinformatics	PE
101.	M. Sc. Botany	BOT4E01	Environmental Biology and Biodiversity Conservation	E&S
102.	M. Sc. Botany	BOT4L07	Practicals of Environmental Biology and Biodiversity Conservation & Genetic Engineering	E&S, PE
103.	B. Lib. i. Sc	BLIS 01	Library, Information and Society	PE , HV, G
104.	B. Lib. i. Sc	BLIS 02	Management of Libraries and Information Centers	PE
105.	B. Lib. i. Sc	BLIS 10	Project Work and Viva	PE
106.	B. Lib. i. Sc	BLIS03	Information Sources, Systems and Services	PE
107.	M.Sc. Computer science	CSS1C02	Advanced Data Structures	PE
108.	M.Sc. Computer science	CSS1C03	Theory of Computation	PE
109.	M.Sc. Computer science	CSS1C04	The Art of Programming Methodology	PE
110.	M.Sc. Computer science	CSS1A01	Introduction to Research (Ability Enhancement Audit Course)	PE
111.	M.Sc. Computer science	CSS2C08	Computer Networks	PE
112.	M.Sc. Computer science	CSS2C09	Computational Intelligence	PE
113.	M.Sc. Computer science	CSS3C11	Advanced Database Management System	PE
114.	M.Sc. Computer science	CSS3C12	Object Oriented Programming Concepts	PE
115.	M.Sc. Computer science	CSS3E01a	Computer Graphics	PE
116.	M.Sc. Computer science	CSS3E01c	Web Technology	PE
117.	M.Sc. Computer science	CSS3E01d	Bioinformatics	HV, PE



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118.	M.Sc. Computer science	CSS2C06	Design and Analysis of Algorithms	PE
119.	M.Sc. Computer science	CSS3E02b	Wireless & Mobile Networks	PE
120.	M.Sc. Computer science	CSS3E02c	Cryptography and Network Security	PE
121.	M.Sc. Computer science	CSS3E02d	Advanced Web Technology	PE
122.	M.Sc. Computer science	CSS3E02e	Virtualization and Cloud Computing	PE
123.	M.Sc. Computer science	CSS4P01	Project Work	PE
124.	M.Sc. Computer science	CSS4E03c	System Security	PE
125.	M.Sc. Computer science	CSS4E03d	Molecular Simulation and Modelling	PE, HV
126.	M.Sc. Computer science	CSS4E03f	Web Engineering	PE
127.	M.Sc. Computer science	CSS4E04f	Advanced Java Programming	PE E&S
128.	BCA	BCA1B01	Computer Fundamentals and HTML	E&S, PE
129.	BCA	BCA2B02	Problem Solving Using C	PE
130.	BCA	BCA2C03	Financial and Management Accounting	PE
131.	BCA	XXXXA11	Python Programming	PE
132.	BCA	A12	Data Communication and Optical Fibers	E&S, PE
133.	BCA	BCA3B04	Data Structures Using C	PE
134.	BCA	BCA3C06	Theory of Computation	PE
135.	BCA	A13	Microprocessors Architecture and Programming	E&S, PE
136.	BCA	A12	Sensors and Transducers	E&S, PE
137.	BCA	BCA4B05	Database Management System and RDBMS	PE
138.	BCA	BCA5B07	Computer Organization and Architecture	E&S, PE
139.	BCA	BCA5B08	Java Programming	PE
140.	BCA	BCA5B09	Web Programming using PHP	PE
141.	BCA	BCA5B10	Principles of Software Engineering	PE
142.	BCA	BCA5D01	Introduction to Computers and Office Automation	PE



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143.	BCA	BCA5D02	Web Designing	PE
144.	BCA	BCA5D03	Introduction to Problem Solving and C Programming	PE
145.	BCA	BCA5D04	Introduction to Data Analysis using Spread sheet	PE
146.	BCA	BCA6B11	Android Programming	PE
147.	BCA	BCA6B13	Computer Networks	PE
148.	BCA	BCA6B17	Industrial Visit and Project Work	PE
149.	BCA	BCA6B16B	Machine Learning	PE
150.	BCA	BCA6B16C	Software testing & Quality Assurance	PE
151.	BCA	BCA6B16D	Technical Writing	PE, HV
152.	BCA	BCA6B16E	Fundamentals of Life Skill Education	HV
153.	BCA	BCA6B12	Operating Systems	PE
154.	BCA	BCA4B05	Database Management System and RDBMS	PE
155.	B.Sc. Computer science	BCS1B01	Computer Fundamentals and HTML	E&S , PE
156.	B.Sc. Computer science	BCS2B02	Problem Solving Using C	PE
157.	B.Sc. Computer science	XXXXA11	Python Programming	PE
158.	B.Sc. Computer science	XXXXA12	Data Communication and Optical Fibers	E&S ,PE
159.	B.Sc. Computer science	BCS3B04	Data Structures Using C	PE
160.	B.Sc. Computer science	BCS4BA13	Microprocessors Architecture and Programming	E&S ,PE
161.	B.Sc. Computer science	BCS3BA13	Sensors and Transducers	E&S ,PE
162.	B.Sc. Computer science	CS4B05	Database Management System and RDBMS	PE
163.	B.Sc. Computer science	BCS5B07	Computer Organization and Architecture	E&S ,PE
164.	B.Sc. Computer science	BCS5B08	Java Programming	PE
165.	B.Sc. Computer science	BCS5B09	Web Programming using PHP	PE
166.	B.Sc. Computer science	BCS5B10	Principles of Software Engineering	PE
167.	B.Sc. Computer science	BCS5D01	Introduction to Computers and Office Automation	PE



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168.	B.Sc. Computer science	BCS5D02	Web Designing	PE
169.	B.Sc. Computer science	BCS5D03	Introduction to Problem Solving and C Programming	PE
170.	B.Sc. Computer science	BCS5D04	Introduction to Data Analysis using Spread sheet	PE
171.	B.Sc. Computer science	BCS6B11	Android Programming	PE
172.	B.Sc. Computer science	BCS6B12	Operating Systems	PE
173.	B.Sc. Computer science	BCS6B13	Computer Networks	PE
174.	B.Sc. Computer science	BCS6B17	Industrial Visit and Project Work	PE, HV
175.	B.Sc. Computer science	BCS6B16b	Machine Learning	PE
176.	B.Sc. Computer science	BCS6B16d	Computer Graphics	E&S ,PE
177.	B.Sc. Computer science	BCS6B16e	Technical Writing	PE
178.	B.Sc. Computer science	BCS6B16f	Fundamentals of Life Skill Education	HV
179.	B.Sc. Computer science	CSC1C01	Computer Fundamentals	E&S
180.	B.Sc. Computer science	CSC2C02	Fundamentals of System Software, Networks and DBMS	PE
181.	B.Sc. Computer science	CSC3C03	Problem Solving Using C	PE
182.	B.Sc. Computer science	CSC4C04	Data Structure Using C	PE
183.	M. COM	MCM2C09	International Busine	E&S
184.	M. COM	MCM4EF03	International Finance	PE
185.	M. COM	MCM4EF04	Advanced Strategic Financial Management	E&S
186.	M. COM	MCM3EF02	Financial Markets and Institutions	E&S
187.	M. COM	MCM3C13	Research Methodology	PE
188.	M. COM	MCM1C01	Business Environment and Policy	PE, E&S
189.	M. COM	MCM1C04	Management Theory and Organizational Behavior	HV
190.	M. COM	MCM1C02	Corporate Governance and Business Ethics	PE
191.	M. COM	MCM2C06	Advanced Corporate Accounting	PE



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192.	M. COM	MCM3C12	Income Tax: Law, Practice and Tax Planning I	PE
193.	M. COM	MCM3C15	Income Tax: Law, Practice and Tax Planning I1	PE
194.	M. COM	MCM3EF01	Investment Management	EE
195.	M. COM	MCM4C14	Financial Derivatives and Risk Management	CE
196.	B.Sc. Food Technology	FTL1B01	Perspectives of Food Science & Technology	PE, G E&S
197.	B.Sc. Food Technology	A13	Entrepreneurship & Environmental Science	PE, G E&S
198.	B.Sc. Food Technology	FTL6B16	Technology Of Animal Foods	E&S ,PE
199.	B.Sc. Food Technology	FTL6B17	Food Safety, Food Laws & Regulations	PE ,E&S ,HV
200.	BBA	BBA1B01	Management Theory and Practice	HV, PE
201.	BBA	BBA1C01	Managerial Economics	E&S,
202.	BBA	BBA2B03	Marketing Management	E&S, HV,P[
203.	BBA	BBA3A12	Professional Business Skills	E&S, HV,P[
204.	BBA	BBA3B04	Corporate Accounting	PE
205.	BBA	BBA3B05	Financial Management	E&S, -PE
206.	BBA	BBA3C02	Business Regulations	E&S, HV,P[
207.	BBA		Entrepreneurship Development	HV,G E&S
208.	BBA	BBA4A14	Banking and Insurance	E&S, HV,
209.	BBA	BBA5B10	Human Resources Planning And Development`	HV
210.	BBA	BBA5B10	Income Tax	PE
211.	BBA	BBA5B08	Business Research Methods	PE
212.	BBA	BBA5B09	Operations Management	HV, PE
213.	BBA	BBA6B12	Organisational Behavior	HV
214.	MSW	SOWIC04	Professional Skills for Social Workers	PE, HV
215.	MSW	SOWIC02	Sociology and Economics for Social Work Practice	HV
216.	MSW	SOW1C01	History, Philosophy and Fields of Social Work	PE,G



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217.	MSW	SOWIC05	Social Legislation and Human Rights	PE, HV
218.	MSW	SOW2C06	Social Case Work	PE, HV ,G
219.	MSW	SOW2C07	Social Group Work	PE, HV ,G
220.	MSW	SOW2C08	Community Organization and Social Action	PE, HV ,G
221.	MSW	SOW2C09	Psychology for Social Work	G
222.	MSW	SOW2C10	Theory and Practice of Counselling	PE, HV ,G
223.	MSW	SOW3C11	Quantitative and Qualitative Methods for Social Work Research	PE
224.	MSW	SOW3C12	Participatory Project Planning and Training	E&S,G
225.	MSW	SOW3C13	Community Health	E&S
226.	MSW	SOW3E101	Health Care Social Work	HV,PE
227.	MSW	SOW3E201	Rural Community Development and Governance	E&S
228.	MSW	SOW3E202	Urban Community Development and Governance	E&S
229.	MSW	SOW4C15	Social Work with Vulnerable groups	G
230.	MSW	SOW4E104	Social Work Practice with Families	G
231.	MSW	SOW4E203	Environmental Studies and Disaster Management	E&S
232.	MSW	SOW4E204	Social Work Practice and Gender	G
233.	BSW	BSWIB01	Introduction to Social Work	PE, HV
234.	BSW	BSW2B02	Fields of Social work	E&S
235.	BSW	BSW3B03	Introduction to Social Case Work	PE
236.	BSW	BSW3B04	Introduction to Social Group Work	HV
237.	BSW	BSW4B05	Introduction to Community Organisation and Social Action	E&S
238.	BSW	BSW5B07	Introduction to Social work Administration	G



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239.	BSW	BSW5BIO	Gandhian Philosophy and Social Work	G
240.	BSW	BSW6B11	Project Planning and Management For	E&S
241.	BSW	BSW6B12	Legal Information for Social Workers	HV
242.	BSW	BSW6B16	Gender and Development in Social Work	G
243.	BSW	BSW5D03	Gender and Development	G
244.	BSW	SGY4(2)CO1	Principles Of Sociology	G
245.	BSW	SGY4(4)CO2	Sociology Of Indian Society	G, E&S
246.	HM & CS	BSH/C1B01	Introduction to Hospitality Industry	
247.	HM & CS	BSH2B02	Accommodation Operations	PE, E&S
248.	HM & CS	BSH3B03	Food and Beverage Production -I	PE
249.	HM & CS	BSH3B04	Food and beverage Service-I	PE
250.	HM & CS	BSH3B04 (P)	Food and Beverage Service -I(Practical)	E&S
251.	HM & CS	BSH5B08	Accommodation Management	E&S
252.	HM & CS	BSH5B09	Rooms Division Management	PE
253.	HM & CS	BSH6B11	Industrial Exposure Training and Report	PE
254.	HM & CS	BSH/C1C02	travel And Tourism	E&S
255.	HM & CS	BSH/C2C03	Event Management	PE
256.	HM & CS	BSH/C3C05	Nutrition Hygiene and Sanitation	E&S, HV
257.	HM & CS	BSH/C3C06	Facility Planning	E&S
258.	HM & CS	BSH/C4C07	Hotel Laws	PE
259.	HM & CS	BSH/C4C08	human Resource Management	HV, PE
260.	HM & CS	BSH/C5D01	Tourism and Hospitality Management	E&S
261.	HM & CS	BSH/C5D02	Basics in Culinary	HV
262.	HM & CS	BSH4B06	Food & Beverage Production -I1	HV
263.	HM & CS	BSH3A12	Professional Business Skills	PE
264.	HM & CS	BSH4A13	Entrepreneurship Development	E&S



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265.	HM & CS	BSH4A14	Banking and Insurance	PE, HV
266.	HINDI	HIN1A07(1)	Prose and Drama	PE , E&S, G &HV
267.	HINDI	HIN2A08(1)	Grammar and Translation	PE
268.	HINDI	HIN3A09	Poetry in Hindi	PE , E&S, G &HV
269.	HINDI	HIN4A10	Novel and Short Stories	PE , E&S, G &HV
270.	HINDI	HIN1A07(2)	Prose Forms in Hindi Literature	PE , E&S, G &HV
271.	HINDI	HIN2A08(02)	Poetry, Correspondence and Translation	PE , E&S, G &HV
272.	HINDI	HIN1A07(3)	Prose and One Act Plays	PE , E&S, G &HV
273.	HINDI	HIN2A08(3)	Poetry and Short Stories	PE , E&S, G &HV
274.	B.Sc. Psychology	PSG1C01	Human Physiology - I	E&S, G
275.	B.Sc. Psychology	PSG2C01	Human Physiology - II	E&S, G
276.	B.Sc. Psychology	PSG3C01	Human Physiology - III	E&S, G
277.	B.Sc. Psychology	PSG4C01	Human Physiology - Iv	E&S, G
278.	B.Sc. Psychology	PSY1B01	Basic Themes in Psychology - I	HV,PE
279.	B.Sc. Psychology	PSY2B01	Basic Themes in Psychology - II	HV,PE
280.	B.Sc. Psychology	PSY3B01	Psychological Measurement & Testing	PE
281.	B.Sc. Psychology	PSY4B01	Individual Differences	HV, G
282.	B.Sc. Psychology	PSY5B01	Abnormal Psychology - I	PE
283.	B.Sc. Psychology	PSY5B02	Social Psychology	HV, G
284.	B.Sc. Psychology	PSY5B03	Developmental Psychology - I	HV,G



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

285.	B.Sc. Psychology	PSY5B04	Psychological Counselling	HV,PE
286.	B.Sc. Psychology	PSY5B05	Health Psychology	HV
287.	B.Sc. Psychology	PSY6B01	Abnormal Psychology - II.	PE
288.	B.Sc. Psychology	PSY6B02	Applied Social Psychology	HV,PE, G
289.	B.Sc. Psychology	PSY6B03	Developmental Psychology - II	HV ,G
290.	B.Sc. Psychology	PSY6B04	Life Skill Education: Applications and Training	HV, G
291.	B.Sc. Psychology	PSY6B0501	Organizational Behaviour	HV
292.	B.Sc. Psychology	PSY5D01	Psychology and Personal Growth	HV,G
293.	B.Sc. Psychology	PSY5D02	Life Skill Applications	HV
294.	B.Sc. Geology	GEO1B01	Essentials of Geology	E&S
295.	B.Sc. Geology	GEO2B03	Dynamic Geology and Geoinformatics	E&S, G HV
296.	B.Sc. Geology	GEO3B05	Crystallography and Mineralogy	E&S
297.	B.Sc. Geology	GEO4B07	Optical and Descriptive Mineralogy	E&S
298.	B.Sc. Geology	GEO5B09	Structural Geology and Geotectonic	E&S
299.	B.Sc. Geology	GEO5B10	Stratigraphy and Sedimentology	E&S
300.	B.Sc. Geology	GEO5B11	Igneous Petrology	E&S
301.	B.Sc. Geology	GEO5B12	Metamorphic Petrology	E&S
302.	B.Sc. Geology	GEO6B17	Paleontology	E&S
303.	B.Sc. Geology	GEO6B18	Indian Geology	E&S
304.	B.Sc. Geology	GEO6B19	Economic Geology	E&S
305.	B.Sc. Geology	GEO6B22(E01)	Environmental Geology	E&S
306.	B.Sc. Geology	GEO5D01	Understanding the Earth	E&S
307.	B.Sc. Geology	GEO5D03	Ground Water Exploration and Management	E&S
308.	Msc.Environmental Sciences	ES1C01	Fundamentals of Ecology and Environment	E&S
309.	Msc.Environmental Sciences	ES1C02	Physical processes in the environment	E&S



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310.	Msc.Environmental Sciences	ES1C04	Environmental pollution and Waste management	E&S
311.	Msc.Environmental Sciences	ES 207	Fundamentals of Environmental Engineering	
312.	Msc.Environmental Sciences	ES2C08	Environmental Microbiology and Biotechnology	E&S
313.	Msc.Environmental Sciences	ES2C09	Hydrology and Water Resource Management	E&S
314.	Msc.Environmental Sciences	ES2C10	Remote Sensing and GIS	E&S
315.	Msc.Environmental Sciences	ES3C13	Environmental assessment tools and monitoring methods.	E&S
316.	MSc.Environmental Sciences	ES3C14	Environmental Toxicology and Occupational Health and Safety	E&S
317.	Msc.Environmental Sciences	ES 3C 15	Biodiversity and Conservation	E&S
318.	Msc.Environmental Sciences	ES 3C 16	Environmental Disaster Management	E&S
319.	Msc.Environmental Sciences	ES4E19	Environmental planning policies and management	E&S
320.	Msc.Environmental Sciences	ES4E20	Indian Environmental Laws	E&S
321.	Msc.Environmental Sciences	ES4E21	Current Environmental Issues in India	E&S
322.	Msc.Environmental Sciences	ES 4E 23	Environmental Economics	E&S



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323.	M.sc.Environmental Sciences	ES4E25	Green Chemistry	E&S
324.	B.Sc. Zoology	ZOL6B10T	Physiology and Endocrinology	G
325.	B.Sc. Zoology	ZOL5D01T	Reproductive Health and Sex Education	G
326.	B.Sc. Zoology	ZOL5B06T	Cell Biology and Genetics	G
327.	MA History	HIS1C02	Pre-Modern Kerala: Problems and Perspectives	G,E&S
328.	MA History	HIS2C02	History of Modern Kerala: Problems and Perspectives	G,E&S
329.	MA History	HIS2C01	History and Theory	G
330.	B.Sc. mathematics	MTS1B01	Basic Logic & Number Theory	PE
331.	B.Sc. Mathematics	MTS5 B 08	Linear Programming	PE
332.	B.Sc. Mathematics	MTS5D01	Applied Calculus	PE, E&S
333.	BA English	FEN1B01	Communication Skills in English	PE
334.	BA English	FEN2B02	Advanced English Grammar	PE
335.	BA English	FEN3B03	Language and Technology	PE
336.	BA English	FEN3B04	Applied Phonetics	PE
337.	BA English	FEN4B05	Fundamentals Of Linguistics	PE
338.	BA English	FEN4B06	Business English	PE
339.	BA English	FEN5B07	Translation Studies	PE
340.	BA English	FEN5B08	Print Media	PE
341.	BA English	FEN5B09	Theatre for Communication	HV,G
342.	BA English	FEN5B10	Contemporary Literary Theory	G ,HV, E&S
343.	BA English	FEN6B11	English Language Teaching	PE
344.	BA English	FEN6B12	Electronic Media	PE
345.	BA English	FEN6B13	Creative Writing	PE
346.	BA English	FEN6B14	Film Studies	PE, G HV



CRITERION	I	Curricular Aspects
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347.	BA English	FEN6B15	Language For Advertising: Theory & Practice	PE, G
348.	BA English	FEN1(2)CO1	Literatures In English: Course I : From Chaucer To The Present	G, HV
349.	BA English	FEN4(3)CO1	Literatures In English: Course II: American & Post Colonial	PE, G , HV ,E&S
350.	BA English	FEN4(3)CO2	Cultural Studies: Course II Cultural Spaces	PE, G , HV ,E&S
351.	BA English	FEN5D02	Language for Advertising: Theory & Practice	G, PE
352.	Sanskrit	CC21USKT5D01	Management Principles in Sanskrit	
353.	Sanskrit	CC21USKT1A 07(01)	SamskrtaSahityasamiksha-I	G,E&S ,HV, PE
354.	Sanskrit	CC21USKT1A 07(02)	SamskrtaSahityadhyayanam-I	G,E&S ,HV, PE
355.	Sanskrit	CC21USKT2A08(01)	SamskrtaSahityasamiksha-II	G,E&S ,HV, PE
356.	Sanskrit	CC21USKT2A09(02)	SamskrtaSahityadhyayanam-II	G,E&S ,HV, PE
357.	Sanskrit	CC21USKT3A09(01)	SamskrtaSahityasamiksha-III	G,E&S ,HV, PE
358.	Sanskrit	CC21USKT4A10(01)	History Of Sanskrit Literature.	G,E&S ,HV, PE
359.	Sanskrit	CC21USKT5D(01)	Management Principles in Sanskrit	G,E&S ,HV, PE
360.	BA Malayalam	MAL1A07(1)	മലയാളസാഹിത്യം 1	G,E&S ,HV, PE
361.	BA Malayalam	MAL2A08(1)	മലയാള സാഹിത്യം 2	G,E&S, HV
362.	BA Malayalam	MAL3A09	മലയാള സാഹിത്യം 3	G,E&S, HV
363.	BA Malayalam	MAL4A10	മലയാള സാഹിത്യം 4	G,E&S, HV
364.	BA Malayalam	MAL1A07(2)	മലയാള സാഹിത്യ പഠനം 1	G,E&S, HV
365.	BA Malayalam	MAL2A08(2))മലയാള സാഹിത്യ പഠനം 2	G,E&S, HV
366.	BA Malayalam	MAL1A07(3)	മലയാളഭാഷയും സാഹിത്യവും 1	HV
367.	BA Malayalam	MAL2A08(3)	മലയാള ഭാഷയും സാഹിത്യവും 2	G,E&S, HV



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368.	BA Malayalam	MAL4(3)C02	കേരള പഠനം അധിനിവേശകാലം, ആധുനികകാലം	E&S
369.	BA Malayalam	MAL1B01	നവോത്ഥാന മലയാളകവിത	G, HV
370.	BA Malayalam	MAL2B02	കഥാസാഹിത്യം	G,E&S, HV
371.	BA Malayalam	MAL3B03	നവീന മലയാളകവിത	G,E&S, HV
372.	BA Malayalam	MAL3B04	ദൃശ്യകലാസാഹിത്യം	E&S, HV
373.	BA Malayalam	MAL4B05	പ്രാചീന, മധ്യകാല മലയാളകവിത	G, HV
374.	BA Malayalam	MAL4B06	മലയാള നോവൽ സാഹിത്യം	G,E&S, HV
375.	BA Malayalam	MAL5B07	മലയാളവ്യാകരണം	G,E&S, HV
376.	BA Malayalam	MAL5B08	പാശ്ചാത്യസാഹിത്യ സിദ്ധാന്തങ്ങൾ	G,E&S, HV
377.	BA Malayalam	MAL5B09	മലയാള സാഹിത്യവിമർശനം	HV
378.	BA Malayalam	MAL5B10	നാടോടിവിജ്ഞാനീയം	G,E&S, HV, PE
379.	BA Malayalam	MAL6B11	ഭാഷാശാസ്ത്രവും ഭാഷാചരിത്രവും	G,E&S, HV, PE
380.	BA Malayalam	MAL6B12	ഗദ്യസാഹിത്യം	G,E&S, HV, PE
381.	BA Malayalam	MAL6B13	പൗരസ്ത്യസിദ്ധാന്തങ്ങൾ	G,E&S, HV, PE
382.	BA Malayalam	MAL6B14	നവസംസ്കാര പഠനങ്ങൾ	G,E&S, HV, PE
383.	BA Malayalam	MAL5D01	ചലച്ചിത്ര പഠനം	G,E&S, HV, PE
384.	BA Malayalam	MAL1(2)C01	കേരള പഠനം പൂർവ്വകാലം, മധ്യകാലം	G,E&S, HV, PE
385.	BPE	CC19UBPE4T21	Health And Fitness Management	G, E&S, HV
386.	BPE	CC19UBPE2T8	Foundation of Physical Education	G, E&S, HV
387.	BPE	CC19UBPE2T9	Educational and Sport Psychology	G, E&S, PE
388.	BPE	CC19UBPE3T14	Tests and Measurement in Physical Education	PE, HV



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389.	BPE	CC15UBPET3	Sociology and Sociology of sports	G, E&S,HV
390.	BPE	CC15UBPE4T18	Management of Physical Education And Sports	G, E&S,HV, PE
391.	BPE	CC19UBPE3T16	Sports Medicine	G, E&S, HV, PE
392.	BPE	CC19UBPE2T10	First Aid and Safety Education and Life Skill Education	G, E&S ,HV, PE
393.	BPE	CC19UBPE4T20	Adapted Physical Education	G, E&S, HV, PE
394.	BPE	CC15UBPE3T15	Scientific Principles of Coaching	G, E&S ,HV, PE
395.	BPE	CC15UBPE4T19	Biomechanics	G, E&S
396.	BPE	CC19UBPE2T6	Teaching Methods in Physical Education	G, E&S, HV, PE
397.	BPE	CC19UBPE3T13	Health Education	E&S,HV, PE
398.	BPE	CC19UBPE4T17	Corrective Physical Education	G, E&S,HV
399.	BPE	CC19UBPE3T12	Kinesiology	G, E&S,HV
400.	BPE	CC19UBPE1T4	History of Physical Education	G, HV
401.	M.Sc. Inte. Geology	GLO1IB01	Earth and Environment	E&S
402.	M.Sc. Inte. Geology	GLO2IB02	Geomorphology	E&S
403.	M.Sc. Inte. Geology	GLO3IB03	Crystallography and Mineralogy	E&S
404.	M.Sc. Inte. Geology	CC20IA11	Biodiversity – Scope and Relevance	E&S, HV
405.	M.Sc. Inte. Geology	CC20IA12	Research Methodology (Theory)	PE, HV
406.	M.Sc. Inte. Geology	GLO4IB04	Optical and Descriptive Mineralogy	E&S
407.	M.Sc. Inte. Geology	CC20IA13	Natural Resource Management	E&S
408.	M.Sc. Inte. Geology	CC20IA14	Intellectual Property Rights	E&S,PE, HV
409.	M.Sc. Inte. Geology	GLO5IB05	Igneous Petrology	E&S
410.	M.Sc. Inte. Geology	GLO5IB06	Metamorphic Petrology	E&S
411.	M.Sc. Inte. Geology	GLO5IB07	Sedimentary Petrology	E&S
412.	M.Sc. Inte. Geology	GLO5IB08	Structural Geology and Geotectonic	E&S



CRITERION	I	Curricular Aspects
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413.	M.Sc. Inte. Geology	GL06IB09	Economic Geology	E&S
414.	M.Sc. Inte. Geology	GL06IB10	Palaeontology	E&S
415.	M.Sc. Inte. Geology	GL06IB11	Stratigraphy and Indian Geology	E&S
416.	M.Sc. Inte. Geology	GL07IB12	Advanced Crystallography and Mineralogy	E&S
417.	M.Sc. Inte. Geology	GL07IB14	Advanced Igneous and Metamorphic Petrology	E&S
418.	M.Sc. Inte. Geology	GL07IB15	Advanced Stratigraphy	E&S
419.	M.Sc. Inte. Geology	GL08IB16	Advanced Structural Geology	E&S
420.	M.Sc. Inte. Geology	GL08IB17	Exploration Geophysics and Field Techniques	E&S
421.	M.Sc. Inte. Geology	GL08IB18	Advanced Economic Geology	E&S
422.	M.Sc. Inte. Geology	GL09IB19	Applied Sedimentology	E&S
423.	M.Sc. Inte. Geology	GL09IB20	Hydrogeology	E&S
424.	M.Sc. Inte. Geology	GL09IB21	Advanced Remote Sensing & Geographic Information System	E&S, HV
425.	M.Sc. Inte. Geology	GL010IB23	Geochemistry And Isotope Geology	E&S
426.	M.Sc. Inte. Geology	GL04IH02(P)	Crystallography and Mineralogy	E&S
427.	M.Sc. Inte. Geology	GL05IH04(P)	Structural	E&S
428.	M.Sc. Inte. Geology	GL06IH05(P)	Economic Geology	E&S
429.	M.Sc. Inte. Geology	GL07IH06(P)	Mineralogy, Crystallography, Geomorphology, Igneous and Metamorphic Petrology	E&S
430.	M.Sc. Inte. Geology	GL08IH07(P)	Structural Geology, Geophysics and Economic Geology	E&S
431.	M.Sc. Inte. Geology	GL09IH08(P)	Sedimentology, Hydrogeology, Remote Sensing and Geographic Information	E&S
432.	M.Sc. Inte. Geology	GL010IH09(P)	Advanced Palaeontology and Geochemistry	E&S
433.	M.Sc. Inte. Geology	GL06IE01(E01a)	Remote Sensing and Geographic Information System	E&S, PE



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434.	M.Sc. Inte. Geology	GLO10IE04(E04c)	Coal and Petroleum Geology	E&S
435.	M.Sc. Clin. psychology	CCAMCP	Personality And Personal Growth	HV, G
436.	M.Sc. Clin. psychology	CCAMCP	Cognitive Psychology	HV, PE
437.	M.Sc. Clin. psychology	CCAMCP	Psychopathology - I	PE
438.	M.Sc. Clin. psychology	CCAMCP	Clinical Psychology: Theory & Practice	PE
439.	M.Sc. Clin. psychology	CCAMCP	Research Methodology	PE
440.	M.Sc. Clin. psychology	CCAMCP	Bio Psychology	PE, G
441.	M.Sc. Clin. psychology	CCAMCP	Psychopathology - II	PE, G
442.	M.Sc. Clin. psychology	CCAMCP	Counselling Psychology	PE, G, HV
443.	M.Sc. Clin. psychology	CCAMCP	Psychotherapeutics - I	PE
444.	M.Sc. Clin. psychology	CCAMCP	Neuropsychology	PE, G
445.	M.Sc. Clin. psychology	CCAMCP	Health Psychology	PE
446.	M.Sc. Clin. psychology	CCAMCP	Psychotherapeutics - II	PE
447.	M.Sc. Clin. psychology	CCAMCP	Forensic Clinical Psychology	HV, G, PE
448.	M.Sc. Applied Geology	GEL 1C 01	Physical Geology and Geomorphology	E&S
449.	M.Sc. Applied Geology	GEL 1C 02	Structural Geology And Geotectonics	E&S
450.	M.Sc. Applied Geology	GEL 1C 03	Geoinformatics	E&S, HV,G
451.	M.Sc. Applied Geology	GEL 1C 04	Stratigraphy And Indian Geology	E&S
452.	M.Sc. Applied Geology	GEL 2C 05	Crystallography And Mineralogy	E&S
453.	M.Sc. Applied Geology	GEL 2C 06	Economic Geology	E&S
454.	M.Sc. Applied Geology	GEL 2C 07	Hydrogeology	E&S
455.	M.Sc. Applied Geology	GEL 2C 08	Applied Palaeontology And Sedimentology	E&S
456.	M.Sc. Applied Geology	GEL 3C 09	Igneous And Metamorphic Petrology	E&S
457.	M.Sc. Applied Geology	GEL 4C 10	Geochemistry and Isotope Geology	E&S
458.	M.Sc. Applied Geology	GEL 3E 01a	Climatology	E&S
459.	M.Sc. Applied Geology	GEL 3E 02b	Quaternary Geology	E&S



CRITERION	I	Curricular Aspects
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460.	M.Sc. Applied Geology	GEL 3E 03a	Marine Geology	E&S
461.	M.Sc. Applied Geology	GEL 4E 04a	Exploration Geology	E&S
462.	M.Sc. Applied Geology	GEL 4E 05a	Engineering Geology	E&S
463.	M.Sc. Applied Geology	GEL 1L 01	Geomorphology, Structural Geology, Geoinformatics	E&S
464.	M.Sc. Applied Geology	GEL 2L 02	Crystallography, Mineralogy, Economic Geology, Hydrogeology, Palaeontology and Sedimentology	E&S
465.	M.Sc. Applied Geology	GEL 3L 03	Igneous And Metamorphic Petrology	E&S
466.	M.Sc. Applied Geology	GEL 4L 04	Geochemistry	E&S
467.	M.Sc Zoology	CCAMZL	Developmental Biology and Endocrinology	G
468.	M.Sc Zoology	CCAMZL	Ecology and Ethology	E&S



CRITERION	I	Curricular Aspects
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SYLLABI OF COURSES CONTAINING CROSSCUTTING ISSUES

(The part of syllabus which contains cross cutting issues are highlighted in red.)

Principles of Taxation (Specialization)

BCM5B10 Principles of Taxation (Specialization)

Module I

Principles of Taxation: Objectives of Taxation - Effects of Taxation on production, distribution and employment - Cannons of Taxation – Tax-GDP Ratio : Meaning -Significance and determinants - Trends in Tax-GDP Ratio - Features of good Taxation System - Tax equity: Benefit principle of Taxation - Ability to pay principle of Taxation - Tax capacity and Tax effort - Meaning of Taxable capacity - Absolute and Relative capacity - Factors determining Taxable capacity.

(20 Hours)

Module II

Classification of Taxes: Direct and indirect Taxes - Relative role of Direct and indirect Taxes in Indian economy - Advantages and disadvantages of Direct and indirect Taxes OECD classification: progressive, proportional and Regressive Taxes - Advalorem and specific taxes - An overview of Direct and Indirect Taxes in India - Central and State Direct and indirect Taxes - Distinction between Direct and indirect taxes.

(15 Hours)

Module III

Incidence of taxation: Impact and incidence- Meaning- Types of tax Incidence- Factors determining extent or tax shifting-Taxation and Efficiency- **Excess burden of taxation- Distribution of Tax burden - Tax evasion in India - Causes and consequences of tax evasion - Methods to curb tax evasion - Tax incentives - Rationale, benefits and cost of tax incidence- Forms of Tax Incidence –Tax Holidays –Investment allowance- Deductions and Incentives.(PE)**

(15 Hours)

Module IV

International Double taxation: Assignment rules of foreign income- source Vs Residence- Methods to alleviate international tax duplication: Exemption – **Tax credit method- Bilateral Tax Treaty- Multilateral**



CRITERION	I	Curricular Aspects
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Tax Treaty- OECD Model & United Nations Model- Tax Conventions- International Tax avoidance and Tax evasion- Transfer pricing- Tax heavens- Tax Treaty shopping- anti avoidance measures- Indian law on double Tax relief.(PE)

(15 Hours)

Module V

Constitutional Provisions Relating to Taxes: Rationale for constitutional arrangements- Distribution of Taxation powers between the centre and states in the Constitution of India - Restriction on the Taxation powers of the States - Sharing of Central Taxes - Recommendations of the Fourteenth Finance Commission (10 Hours)

References :

1. Musgrave. Richard and Peggy Musgrave, 'Public Finance in Theory and practice', Tata McGraw Hill publishing Company Ltd, New Delhi.
2. Peerzode, Sayal Afzar, 'Economics of taxation' Atlantic publishers & Distributors Pvt Ltd.
3. Tyagi B.P, 'Public Finance', Jai Prakash Nath and Company, Meerut.
4. Sury M.M., 'Fiscal Policy Development in India 1947-2007', Indian Tax Foundation in association with New Century publications, New Delhi.
5. Goode Richard 'Government Finance in Developing Countries,, Tata McGraw Hill Publishing Co. Ltd, New Delhi.
6. Lekhi R.K, 'Public Finance', Kalyani publishers, New Delhi.
7. Basic international Taxation principles : Vol I & II Roy Robatgi, Taxman.
8. Singhania Vinod K, 'Direct taxes: Law and practice', Taxmann publications (p) Ltd, New Delhi.

Indirect Taxes Law and Practice (Specialisation)

BCM5B11 Indirect Taxes Law and Practice (Specialization)

Module I

Introduction to Indirect Taxes: Taxation under Constitution- Direct and Indirect Taxes Indirect Taxes – Concept and Features – Types of Indirect Taxes – Constitutional provisions relating to Indirect Taxes- Merits and demerits – Goods and Services Tax- Brief history behind the emergence of GST-Definitions and meaning– Need for GST in India- The scope of GST.

(10 Hours)



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module II

Goods and Services Tax:– Central Goods and Services Tax Act–Integrated Goods and Services Tax Act - State Goods and Services Tax Act - Levy and Collection of Central/State Goods and Services Tax - Taxable person - Power to grant exemption from tax - Time and value of supply of goods - Time of supply of services- Registration –Persons not liable for registration-Compulsory registration in certain cases- (PE)Procedure for registration-Deemed registration- Cancellation of registration - Revocation of cancellation of registration - tax invoice, credit and debit notes – Returns - First Return - Annual return - Final return - Tax Return Preparers - Levy of late fee - Notice to return defaulters.(PE)

(20 Hours)

Module III

Procedure and Payment of Tax: Payment of tax, interest, penalty and other amounts - Interest on delayed payment of tax - Tax deduction at source - transfer of input tax credit - refund of tax - accounts and records - demands and recovery I - Inspection, search, seizure and arrest - offences and penalties - Audit by tax authorities - Special audit - Power of CAG to call for information. (PE)

(15 Hours)

Module IV

Customs Duty : Introduction-Customs Act, 1962 – Scope of Customs Law- Meaning of Customs Duty- Important definitions – Customs Authorities- Functions of Customs Department-Taxable event of Import/Export of goods-Types of Customs Duties – Classification and valuation of goods– Export Procedures- Import Procedures-Provisions governing import and export of goods – Baggage rules- Assessment- Abatement and remission of duty-Exemptions from Customs Duties- penalty refund and recovery. (PE)

(20 Hours)

Module V

Arrival/Departure and Clearance of goods: Arrival/Departure and Clearance of goods ware housing- Duty drawback-Clearance of EXIM goods and goods in transit-Transportation and Warehousing provisions- Special provisions regarding

baggage, courier and post provision related to prohibited goods, notified goods, specified goods, illegal importation/exportation of goods. (PE)

(15 Hours)

Reference Books;

1. The Central Goods and Service Tax, 2017
2. The Integrated Goods and service tax, 2017
3. The Union Territory Goods and Service tax, 2017



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. Goods and Service Tax (Compensation to States, 2017
5. The Constitution (101nd Amendment) Act, 2016.
6. Gupta,S.S. (2017). How to meet your Obligation.India: Taxmann
7. Gupta,S.S. (2017).Vastu and Sevakar.India: Taxmann
8. GST Manual (2018)(Ed.): Taxmann
9. Mishra, S. K. (2017) Indirect Tax Laws: Centax

Income Tax Assessment (Specialization)

BCM6B14 Income Tax Assessment (Specialisation)

Module I

Computation of Taxable Income: clubbing of incomes and aggregation of incomes- set off and carry forward of losses- Incomes exempt from tax- agricultural income and its tax treatment- deductions from Gross Total Income-Rebate and Relief- computation of Total Income (PE)

(15 Hours)

Module II

Assessment of various entities

- i.Assessment of individuals: Treatment of income received from different institutions- computation of taxable Income and Tax liability- Application of Alternate Minimum Tax (AMT) on individuals- Tax planning for individuals with respect to all 5 Heads of income, deductions, exemptions, rebate, relief, concessions and incentives.
- ii.Assessment of Hindu Undivided Family: Schools of Hindu Law- Residential status of HUF- Income not to be treated as family income- computation of Total income of HUF and tax liability.(PE)

(25 Hours)

Module III

Assessment of firms and association of persons

- i.Assessment of Firms- computation of Book profit- Remuneration to partners- computation of total income and tax liability.
- ii.Assessment of AOP/BOI- computation of total income of AOP/BOI- Tax liability of AOP/BOI- Treatment of share of income from AOP/ BOI. (PE)

(15 Hours)

Module IV



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Assessment of co-operative societies and trusts: co-operative societies –Meaning- **deductions u/s 80P- other deductions-computation of taxable income & tax liability. (PE)**Trusts: definition-creation-registration-types of trusts-**tax exemptions-accumulation of income- income not exempted- Assessment of Trust.(PE)**

(10 hours)

Module V

Procedure For Assessment : Filing of different types of Returns of income - Types of assessment - **Deduction and collection of Tax at source - Advance payment of Tax Recovery of Tax(PE)** - Income Tax Authorities - Appeals and Revision - Penalties & Prosecutions.

(10 Hours)

(Theory and Problem may be in the ratio of 40% and 60% respectively)

References :

1. Mehrotra H.C, Goyal S.P, Direct Taxes, Sahitya Bhavan, New Delhi.
2. Bhagavathi Prasad, Direct Taxes Law & Practice, Wishwa Prakashan, NewDelhi.
- 3 . Vinod K Singania & Kapil Singania, Taxmans' Direct Tax Laws & Practice, Taxman Publications (P) Ltd.
4. Gaur V.P , Narang, Income Tax Law & Practice, Kalyani Publishers.
- 5, Lal B.B, Direct Taxes, Konark Publishing House, New Delhi.

Corporate Taxation and Tax Planning (Specialization)

BCM6B15 Corporate Taxation and Tax Planning (Specialization)

Module I

Assessment of companies: Definition of company - Types of companies - Residential status and incidence of tax - carry forward and set off of losses in the case of companies - Deduction available to Corporate Assessee - computation of corporate Tax.

(15 Hours)

Module II

Computation of Taxable Income & Tax Liability: special provisions applicable to assessment of Total Income of Companies - Computation of Total Income of Companies - Determination of amount of Corporate Tax liability - Minimum Alternative Tax (MAT) -Tax on distributed profits of domestic Companies-Tax on amount distributed to unit holders - Security Transaction Tax.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

(25 Hours)

Module III

Introduction to Tax Planning; Meaning of Tax Planning and Management, **Tax evasion and Tax avoidance (PE)**- Nature and scope of Tax planning and Management in the corporate sector - Justification of Corporate Tax planning and Management .

(10 Hours)

Module IV

Tax Planning For Specific Management Decisions : **Tax Planning with Capital structure decisions - Dividend Policy - Bonus shares - Investments and Capital Gains - owning or Leasing of an asset - Make or buy, repair /replace, export or domestic sales, shut down or continue.(PE)**

(15 Hours)

Module V

Tax Planning For Setting up of a New Business: Implication of Tax Concessions and Incentives for Corporate decision in respect of setting up of a new business, location, nature and form of business - **Tax Planning relating to Special Economic Zone (SEZ), Export Processing Zones, Infrastructure Sector and backward areas - Tax Incentives for exports.(PE,E&S)**

(10 Hours)

(Theory and Problem may be in the ratio of 50% and 50% respectively)

References :

1. Mehrotra H.C, Goyal S.P,'DirectTaxes,, Sahitya Bhavan, New Delhi.
2. Bhagavathi Prasad, 'Direct Taxes Laws & Practice',. Wishwa Prakashan, NewDelhi.
3. Vinod K Singhania, Monica Singhania, 'Corporate Tax Planning And Business Tax Procedure', Taxman publications pvt Ltd, New Delhi.
4. 'Corporate Tax Planning And Management', Lakbotia Vision Publishers.
5. Aggarwal P. K, 'Tax Planning For Companies', Hind Law Publishers, New Delhi.
6. Lal B.B & N. Vashisht, 'DirectTaxes - Income Tax & Tax Planning', Konark Publishing House, New Delhi,
7. Girish Ahuja, &. Ravi Gupta, 'Direct Tax Law And Practice And Tax Planning',Bharat Law House Pvt Ltd, New Delhi.
8. Manmohan, 'Direct Taxes With Tax Planning'.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Angiosperm Anatomy and Microtechnique

BOT1C01T Angiosperm Anatomy and Microtechnique

Angiosperm Anatomy

Module – I (9 hrs)

1. Tissues - Definition, Kinds - Meristematic & Permanent. (8 hrs)
 - Meristematic tissues - Classification – based on origin & position; Organization of root apex and differentiation of tissue – Histogen theory; Organization of stem apex and differentiation of tissues - Tunica & Corpus theory.
 - Permanent tissues - Definition - classification; Simple tissues (Parenchyma, Collenchyma and Sclerenchyma), Complex tissues (Xylem & Phloem) Secretory tissues - Glandular tissues (Nectaries in *Euphorbia pulcherrima*, Stinging hairs in *Tragia*) Oil glands in *Citrus*, *Eucalyptus*; Digestive glands in *Nepenthes*; Laticiferous tissues (non-articulate latex ducts in *Euphorbia* and articulate latex duct – latex vessels in *Hevea*),
2. Vascular bundles – types: conjoint - collateral, bicollateral, concentric and radial.

Module – II (6 hrs)

1. Primary structure of dicot and monocot root, dicot and monocot stem and leaf in dicot and monocot.

Module – III (12 hrs)

1. Normal secondary thickening in dicot stem (*Vernonia*).
 - Intra stelar thickening: formation of cambial ring, its structure, fusiform and ray initials, storied and non - storied cambium, activity of the cambium, formation and structure of secondary wood, secondary phloem and vascular rays.
 - Extra stelar thickening: formation, structure and activity of the phellogen, formation of periderm in stem and root; bark and lenticel.
 - Growth rings, ring and diffuse porous wood, sapwood and heart wood, tyloses.
 - Normal secondary thickening in dicot root (*Tinospora*)
2. Anomalous secondary growth in *Boerhaavia*.

References: (Angiosperm Anatomy)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Cuttler, E.G. 1969. Plant Anatomy - Part I Cells & Tissue. Edward Arnold Ltd., London.
2. Cuttler, E.G. 1971. Plant Anatomy, Part III Organs Edward Arnold Ltd., London.
3. Esau K. 1985. Plant Anatomy (2nd ed.) Wiley Eastern Ltd. New Delhi.
4. Pandey B.P. Plant Anatomy, S. Chand & Co. Delhi.
5. Vasishta P.C. 1974. Plant Anatomy, Pradeep Publication, Jalandhar.
6. Tayal M.S Plant Anatomy. Rastogi Publishers, Meerut.

Microtechnique

Module – I (9 hrs)

1. Microtechnique - Brief Introduction
2. Microscopy: simple, compound and electron microscope
 1. Microtomy: Rotary type, serial sectioning, paraffin method, significance.
 2. Killing and fixing: Killing and fixing agents and their composition (Farmer's fluid and FAA.)
 3. Dehydration and clearing - reagents (mention only)
 4. Stains – Saffranin and acetocarmine, preparation and use.

References (Microtechnique)

1. Johansen, D.A. (1940) Plant Microtechnique. Mc Graw – Hill Book Company, Inc. New York.
2. Kanika, S. (2007) Manual of Microbiology – Tools and Techniques. Ane's student edition.
3. Khasim, S.K. (2002) Botanical Microtechnique; principles and Practice, Capital Publishing Company, New Delhi.
4. Toji, T. (2004) Essentials of Botanical Microtechnique. Apex Infotec Publ.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Cryptogams, Gymnosperms and Plant Pathology

BOT2C02T Cryptogams, Gymnosperms and Plant Pathology

Cryptogams & Gymnosperms

Module – I : Virus, Bacteria, BGA (9 hrs)

1. Virus: General account of viruses, including structure of TMV & Bacteriophage.
2. Bacteria: Classification based on shape of flagella, structure, nutrition (brief account), reproduction and economic importance - agriculture, industry and medicine.
3. Cyanobacteria: General account, structure, life - history and economic importance of Nostoc.

Module – II : Phycology, Mycology, Lichenology (12 hrs)

1. Phycology: General characters, classification, evolutionary trends in algae. (2 hrs)
2. Structure, reproduction, life history and economic importance of the following classes with suitable examples:
 - a. Chlorophyceae (*Spirogyra*)
 - b. Phaeophyceae (*Sargassum*)
 - c. Rhodophyceae (*Polysiphonia*).
1. Mycology: General characters, classification (Alexopoulos, 1979) (brief mention only) and evolutionary trends, economic importance in fungi.
2. Important features of the following divisions (brief account only)
 - a. Mastigomycotina
 - b. Zygomycotina
 - c. Ascomycotina
 - d. Basidiomycotina.
3. Structure and life history of *Puccinia* (developmental details not required)
4. Lichenology: General account and economic importance of Lichens with special reference to *Usnea*.

Module – III : Bryology, Pteridology , Gymnosperms (12 hrs)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. **Bryology: General account, morphology and life - history of *Riccia*** (4 hrs)
2. **Pteridology: General account, morphology and life history of *Selaginella*** (4 hrs)
3. **Gymnosperms: General account, morphology and life history of *Cycas*** (4 hrs)

References (Cryptogams & Gymnosperms)

1. Fritsch, F.E. (1935). The structure and reproduction of the algae. Vol. 1 and II, Uni. Press. Cambridge.
2. Morris, I. (1967) An Introduction to the algae. Hutchinson and Co. London.
3. Papenfuss, G.F. (1955) Classification of Algae.
4. B.R. Vasishta. Introduction to Algae
5. Mamatha Rao, (2009) – Microbes and Non-flowering plants. Impact and applications. Ane Books, New Delhi.
6. Sanders, W.B. (2001) Lichen interface between mycology and plant morphology. Bioscience, 51: 1025-1035.
7. B.R. Vasishta. Introduction to Fungi.
8. P.C. Vasishta Introduction to Bryophytes.
9. B.P. Pandey Introduction to Pteridophytes
10. Chamberlain C.J., (1935) Gymnosperms – Structure and Evolution, Chicago University Press.
11. Sreevastava H.N. (1980) A Text Book of Gymnosperms. S. Chand and Co. Ltd., New Delhi.
1. Vasishta P.C. (1980) Gymnosperms. S. Chand and Co., Ltd., New Delhi.

Plant Pathology

Module – 4 (3 hrs)

1. Plant Pathology: Study the following plant diseases with special reference to pathogens, symptoms, method of spreading and control measures.
 1. Leaf mosaic of Tapioca 2) Citrus canker 3) Blast of paddy.

References: Plant Pathology

1. Agros, G.N. (1997) Plant Pathology (4th ed) Academic Press.
2. Bilgrami K.H. & H.C. Dube. (1976) A textbook of Modern Plant Pathology. International Book Distributing Co. Lucknow.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Pandey, B.P. (1999) Plant Pathology. Pathogen and Plant diseases. Chand & Co. New Delhi.

Morphology, Systematic Botany, Economic Botany, Plant Breeding and

Horticulture

BOT3C03T

Morphology, Systematic Botany, Economic Botany, Plant Breeding and Horticulture

Morphology

Module - I

1. Leaf – Structure, simple, compound, venation and phyllotaxy. (2 hrs)
2. Inflorescence - racemose, cymose, special, types with examples (3 hrs)
3. Flower - as a modified shoot- structure of flower - floral parts, their arrangement, relative position, cohesion and adhesion of stamens, symmetry of flowers, types of aestivation and placentation.

Practical (Morphology)

1. Identify the types of inflorescence mentioned in the syllabus. All the types mentioned must be represented in the photo album. (All drawings in record are replaced by photo album submission).

Reference (Morphology)

1. Sporne, K.R. (1974) Morphology of Angiosperms. Hutchinson.

Systematic Botany

Module- I

1. Introduction, scope and importance
2. Herbarium techniques: collection, drying, poisoning, mounting & labeling. Significance of herbaria and botanical gardens; important herbaria and botanical gardens in India.



CRITERION	I	Curricular Aspects
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3. Nomenclature - Binomial system of nomenclature, basic rules of nomenclature (validity, effectivity and priority), ICN for algae, fungi and plants.
4. Systems of classification - Artificial, Natural of Phylogenetic (Brief account only). Bentham & Hooker's system of classification in detail.
5. Modern trends in taxonomy - Chemotaxonomy, Numerical taxonomy and Cytotaxonomy (brief account only)
6. Study the following families: Malvaceae, Fabaceae (with sub-families) Rubiaceae, Apocynaceae, Euphorbiaceae and Poaceae.

References (Systematic Botany)

1. Radford, A.E. (1986) Fundamentals of Plant Systematics. Harpor & Row Publishers, New York.
2. Sivarajan, V.V. (1991) Introduction to Principles of Plant Taxonomy. Oxford & IBH, New Delhi.
3. Jeffrey, C. (1968) An introduction to Plant Taxonomy, Cambridge University Press, London.
4. Gurucharan Singh, (2001) Plant Systematics. Theory and practice. Oxford & IBH Publications New Delhi.
5. Gurucharan Singh, (2019) Plant Systematics - An Integrated Approach, 4th edition. CRC Press. Florida.
6. Sharma O.P. (1990) Plant Taxonomy – Tata McGraw Hills. Publishing company Ltd.
7. Subramanyam N.S. (1999) Modern Plant Taxonomy. Vikas Publishing House Pvt Ltd.
8. Pandey & Misra. (2008) Taxonomy of Angiosperms. Ane books Pvt Ltd.

Economic Botany

Module –I

1. Brief account on the various categories of plants based on their economic importance
2. Study the following plants with special reference to their binomial, family, morphology of the useful part and their uses.
 1. Cereals: Paddy, Wheat
 2. Pulses: Black gram, Green gram
 3. Oil: Coconut, Gingelly
 4. Fibre: Cotton



CRITERION	I	Curricular Aspects
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5. Latex: Rubber
6. Beverages: Tea, Coffee
7. Spices: Pepper, Cardamom, Clove
8. Medicinal plants: *Rauvolfia serpentina*, *Justicia adhatoda*, *Santalum album* and *Curcuma longa*.

References (Economic Botany)

1. Pandey B. P (1987) - Economic Botany
2. Verma V. (1984) - Economic Botany
3. Hill A.W (1981) - Economic Botany, McGraw Hill Pub

Plant Breeding

1. Objectives of plant breeding
2. **Methods of plant breeding: a) Plant introduction b) Selection - Mass, Pure line and clonal, c) Hybridization: intervarietal, interspecific and intergeneric hybridization. d) Mutation breeding e) polyploidy breeding and f) breeding for disease resistance.**

References (Plant Breeding)

1. Allard. R.W. (1960) Principles of Plant breeding, John Wiley & Sons, Inc, New York.
2. Singh, B.D. (2005) Plant Breeding - Principles & methods, Kalyani Publishers, New Delhi.
3. Chaudhari. H.K. Elementary Principles of Plant breeding, Publishers. Oxford & IBH

HORTICULTURE

1. Horticulture- introduction: definition, branches, significance
2. **Methods of plant propagation**
 1. Seed propagation
 2. Vegetative propagation
 3. Cutting – stem, root, leaf
 4. Layering –air layering
 5. Grafting: Approach grafting, Tongue grafting
 6. Budding: Patch and T-budding

References (Horticulture)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. K. Manibhushan Rao. (2005). Text book of Horticulture, Macmillan India Ltd.
2. N. Kumar. (1996) Introduction to Horticulture – First Edition, Rajalakshmi Publication,

Plant Physiology, Ecology and Genetics

BOT4C04T Plant Physiology, Ecology And Genetics

Plant Physiology

Module – I (16 hrs)

1. Structure of plant cell and cell organelles (Brief account only)
2. Water relations - Permeability, Imbibition, Diffusion, Osmosis and water potential
3. Absorption of water- Active and passive mechanisms
4. Ascent of sap -Root pressure theory, Transpiration pull or cohesion-tension theory.
5. Transpiration -Types, mechanism of stomatal movement: K⁺ ion theory, significance of transpiration, antitranspirants.
6. Mineral nutrition- General account on Micro and macro nutrients. Methods of studying plant nutrition- solution culture-The essential elements - criteria of essentiality. function and deficiency symptoms of the following mineral nutrients: N, P, K, Mg, Fe, Zn, Mn

Module – II (10 hrs)

1. Photosynthesis: Introduction, significance, Two pigment systems, red drop, Emerson enhancement effect, action and absorption spectra, Mechanism of photosynthesis - Light reaction, cyclic & non-cyclic photo phosphorylation, Dark reactions–Calvin cycle, C₄ cycle, photorespiration (a brief account only). Factors affecting photosynthesis.

Module – III (10 hrs)

1. Plant growth: Definition, phases of growth, natural plant hormones, synthetic auxins (Brief account only)
2. Senescence and abscission, Photo-periodism & vernalization.
3. Dormancy of seeds- Factors causing dormancy, photoblastin, techniques to break dormancy, physiology of fruit ripening.



CRITERION	I	Curricular Aspects
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Practical (Plant Physiology)

Learn the principle and working of the following apparatus/experiments

1. Thistle funnel osmoscope
2. Ganong's potometer
3. Ganong's light-screen
4. Absorbo transpirometer
5. Kuhne's fermentation vessel
6. Mohl's half-leaf experiment
7. Experiment to show evolution of O₂ during photosynthesis

References (Plant Physiology)

1. William G. Hopkins (1999). Introduction to Plant Physiology, 2nd edition, John Wiley & Sons, Inc.
2. Frank B. Salisbury and Cleon W. Ross (2002). Plant Physiology 3rd edition. CBS publishers and distributors.
3. G. Ray Noggle and George J. Fritz (1983) Introductory Plant Physiology Prentice Hall.
4. Goodwin Y.W. and Mercer E.I. (2003) Introduction to Plant Biochemistry. 2nd edition. CBS Publishers and distributors.

Plant Ecology

Module – I (9 hrs)

1. Ecology-Definition, Ecosystem: ecological factors –biotic and abiotic.
2. Ecological adaptations: Morphological, anatomical and physiological adaptations of the following types: Hydrophyte (*Vallisneria*, *Hydrilla*), Xerophyte (*Opuntia*, *Nerium*), Halophyte (*Avicennia*), Epiphytes (*Vanda*) and parasites. (*Cuscuta*).
3. Ecological succession –Process of succession, types of succession, Hydrosere.

References (Plant Ecology)

1. Ambasht R.S. 1988. A text book of Plant Ecology. Students Friends Co. Varanasi.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2. Dash M.C. 1993. Fundamentals of Ecology. Tata McGraw Hill Publishing Company Ltd. New Delhi.
3. Michael S. 1996. Ecology. Oxford University Press, London.
4. Sharma, P.D. 2008-2009. Ecology and Environment. Rastogi Publication.
5. Kumar H.D. 1977. Modern Concepts of Ecology. Vikas Publications. New Delhi.

Genetics

1. Introduction and brief history of genetics
2. Mendel's experiments, symbolisation, terminology, heredity and variation;
3. Monohybrid cross, Dihybrid cross, Laws of Mendel, test cross and back cross.
4. Modified Mendelian ratios: Incomplete dominance in *Mirabilis jalapa*.
5. Gene interactions: Complementary genes -flower colour in *Lathyrus odoratus* (9:7 ratio), Epistasis - Fruit colour in *Cucurbita pepo* (12:3:1 ratio).

References (Genetics)

1. Sinnot, W.L.C. Dunn & J. Dobzhansky (1996) Principles of Genetics. Tata McGraw Hill Publishing Company Ltd., New Delhi.
2. Verma, P.S. & Agarwal (1999). Text book of Genetics. S. Chand & Co., New Delhi.
3. Rastogi V.B. (2008), Fundamentals of Molecular Biology, Ane Books, India.
4. Gupta, P.K. Text Book of Genetics. Rastogi Publications, Meerut.

Angiosperm Anatomy, Microtechnique, Cryptogams & Gymnosperms, Plant Pathology, Systematic Botany, Economic Botany, Plant Breeding, Horticulture, Plant Physiology, Plant Ecology, Genetics (Practical)

BOT2C05 Angiosperm Anatomy, Microtechnique, Cryptogams & Gymnosperms, Plant Pathology, Systematic Botany, Economic Botany, Plant Breeding, Horticulture, Plant Physiology, Plant Ecology, Genetics (Practical)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Practical (Angiosperm Anatomy)

1. Identity simple and complex tissues and determine the type of vascular bundles using microscope.
2. Make suitable micro preparations to study the anatomy of the following:
 - a. A Dicot stem: *Cephalandra*, *Centella* (Primary); *Vernonia* (secondary).
 - b. Monocot stem: Bamboo
 - c. Dicotroot: *Tinospora* (young–Primary; mature–Secondary)
 - d. Monocot root: *Colocasia*
 - e. Anomalous secondary growth (*Boerhaavia*).
 - f. Dicot leaf: *Ixora* and Monocot leaf: grass.

Practical (Microtechnique)

1. Familiarise the structure and working of compound microscope (drawings not required)
2. Preparation of Safranin, FAA and Acetocarmine

Practical (Cryptogams & Gymnosperms)

1. Make suitable micro preparations of vegetative and reproductive structures of *Sargassum*, *Puccinia*, *Riccia*, *Selaginella* and *Cycas*
2. Identify and draw labeled diagrams of all the types mentioned in the syllabus

Practical (Plant Pathology)

1. Identify the diseases (mentioned in the theory syllabus) on the basis of symptoms and causal organisms. (Drawings can be replaced by photos pasted in the record).

Practical (Systematic Botany)

1. Determine the systematic position of local plants comes under the syllabus based on their vegetative and floral characters
2. Students shall be able to describe the plants in technical terms and draw the L.S. of flower of two plants belong to each family and record the same.
3. Familiarization of herbarium techniques (Demonstration only).
4. Mounting of a properly dried and pressed specimen of any wild plant from any one of the families mentioned in the syllabus, with proper herbarium label (to be submitted in the record book).
5. Students shall submit original images of plants, at least one from each family mentioned in the syllabus duly certified by HoD, at time of examination. Web sourced and outsourced images should not be used. The images of plants should be properly identified and they should carry details



CRITERION	I	Curricular Aspects
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like systematic position, GPS location, date, name and register no. of the student etc. Habitat, Habit, Inflorescence and single flower should be represented. The images can be submitted along with the photo album containing images of inflorescence mentioned under morphology. Individuality should be strictly maintained while preparing the photo album.

Practical (Economic Botany)

1. Identify at sight the economically important plant produces and products mentioned in module III, and learn the binomial and family of the source plants, morphology of the useful parts and uses. (Drawing not required)

Practical (Plant Breeding)

- 1 Demonstration of hybridization techniques.

Practical (Horticulture)

1. Demonstration of layering, grafting and budding

Practical (Plant Physiology)

Learn the principle and working of the following apparatus/experiments

8. Thistle funnel osmoscope
9. Ganong's potometer
10. Ganong's light-screen
11. Absorbo transpirometer
12. Kuhne's fermentation vessel
13. Mohl's half-leaf experiment
14. Experiment to show evolution of O₂ during photosynthesis

Practical (Plant Ecology)

Study the morphological and anatomical adaptations of the hydrophytes, xerophytes, halophytes, epiphytes and parasites mentioned in the syllabus (drawing not required)

Practical (Genetics)

1. Students are expected to work out problems related to Monohybrid, Dihybrid, Test cross, Incomplete dominance and Modified Mendelian ratios and has to be recorded.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Business Management

BCMIB01 Business Management (Core)

Module I

Concepts of Management – Characteristics of management – Schools of management thought - Management and administration – Management by objectives – Management by participation – Management by exception – Management by motivation - Functions of management – Planning– Organizing - Departmentation – Delegation

Module II

Functions of Management:– Motivation: – concept and importance – Contributions of McGregor, Maslow and Herzberg – Leadership – Concept and styles – Leadership traits - Communication – process and barriers – Control – concept - steps – tools – Coordination – Concept, Principles, Techniques.

Module III

Business Ethics:– Ethics and Morality – Theories of ethics: Teleological theory – Deontological theory – Virtue theory – Types of ethics – Meaning and scope of business ethics - Characteristics – Objectives of Business Ethics - Factors influencing business ethics – Arguments for and against business ethics – Different views of business ethics - The Separatist View, The Unitarian View, The Integration View, Ethical issues in global business.

Module IV

Corporate Social Responsibility (CSR): Meaning and definition - History of CSR activities – Concept of Corporate citizenship - Need and importance of CSR – Stakeholders of CSR – Steps in the implementation of CSR activities – CSR and business ethics - CSR and corporate governance – CSR initiatives in India.

Module V

Emerging concepts in management – Kaizen – TQM – TPM – MIS – ISO – Change management – Stress management – Fish bone (ISHIKAWA) Diagram – Holacracy - Rank & Yank - 20% time - Gamification - Flexi-working - Business eco system – Logistic management.

Reference Books:

1. Boatwright. John R: Ethics and the Conduct of Business, Pearson Education, New Delhi.
2. Gupta. CB; Business management, Sultan Chand & sons
- 3 Koontz, H and Wehrick, H: Management, McGraw Hill Inc, New York.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- 4 Prasad. LM; Principles and Practicd of Management; Sultan Chand & sons
- 5 Stoner. AF and Freeman RE; Management; Prentice Hall of India
- 6 Drucker, Peter, F., Management: Tasks, Responsibilities and Practices, Allied Publishers, New Delhi.
7. R.S Davar; Management Process
8. Rustum & Davan, Principles and Practice of Management. 7. Srinivasan & Chunawalla, Management Principles and Practice.
9. S. V. S. Murthy. Essentials of Management.
10. Stoner, Freeman & Gilbert, Jr.: Management, Prentice Hall of India Private Limited, New Delhi.
11. Tripathy & Reddy: Principles of Management, Tata McGraw-Hill Publications, New Delhi.
12. Stephen P. Robbins: Organizational Behaviour, Prentice Hall of India Private Limited, New Delhi.
13. Udai Pareek: Understanding Organizational Behaviour, Oxford University Press, New Delhi.
14. S. S. Khanka: Organizational Behaviour: Text and Cases, S. Chand & Company Limited, New Delhi.]

Managerial Economics

BCM1C01 Managerial Economics (Complimentary)

Module I

Managerial Economics:- – Definition and characteristics – Nature and Scope - Economics Vs Managerial Economics - Decision making and forward planning – Relationship of managerial economics with other disciplines - Basic economic tools in management economics – The role of managerial economist.

Module II

Theory of consumer behaviour: - Cardinal analysis - Law of diminishing marginal utility – consumer surplus; Ordinal approach – indifference curve analysis – consumer equilibrium – income consumption curve and price consumption curve – Hicksian decomposition of price effect in to substitution effect and income effect – Demand curve for normal, inferior and giften goods – concept of elasticity of demand – measurement of various elasticities – Elasticity of supply.

Module III

Market structure:

a. Perfect competition: – profit maximization and equilibrium of firm and industry – short run and long term supply curves – price and output determination. b. Monopoly: – Price determination under monopoly – equilibrium of firm – comparison between perfect competition and monopoly – price discrimination. c.



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Monopolistic competition: price and output determination – product differentiation – comparison with perfect competition – excess capacity under monopolistic competition. d. Oligopoly: indeterminate pricing and output – classical models of oligopoly – price leadership - collusive oligopoly – kinked demand curve.

Module IV

An overview of Indian economy - Indian economy since 1991 - Basic characteristics of Indian economy - Factors that led to the opening up of Indian economy - Indian economy under WTO regime - Issues in Indian economy: Problems of growth, unemployment, poverty, inequality in income distribution, inflation – The role of parallel economy – The role of Government in a market economy.

Module V

Structure and direction of India’s foreign trade and India’s trade regulation and promotion - Exchange rate policy – Intellectual Property Rights - Foreign capital and MNCs in India, Trade reforms - An overview of Kerala economy - Trade and commerce in Kerala - Industrial development of the state - the role of small scale industries in Kerala economy.

Reference Books:

1. R.L. Varshney and K.L. Maheswari, Managerial Economics
2. Ahuja. HL; Business Economics, S. Chand & co.
3. D.N. Dwivedi, Managerial Economics
4. Dr. S. Sankaran, Managerial Economics
5. DM Mithani: Business Economics
6. Seth M L Text Book of Economic Theory
7. K K Dewett: Economic Theory
8. Dutt & Sundaram: Indian Economy
9. Petersen &. "Lewis: Managerial Economics
- 10.Mote V L peul. S & Gupta G S: Managerial Economics
11. H. Craig Petersen & W. Cris lewis: Managerial Economics
- 12.Dr. P.N. Reddy and H.R, Appanaiah : Essentials of Business Economics
- 13.Barry Keating and J. Holton Wilson: Managerial Economics



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Financial Accounting

BCM2B02 Financial Accounting (Core)

Module I

Single Entry System of Accounting: Definition – Objectives - Advantages- Limitations- Distinction between Double entry and Single entry- Types of Single entry- Determination of Profit or Loss under single entry- Statement of Affairs/ Capital comparison method- Distinction between Balance Sheet and Statement of Affairs- Distinction between Profit and loss account and Statement of Profit and Loss- Conversion method- Practical Problems.

Module II

Company Accounts- Issue of Shares: Introduction- Books of accounts maintained by companies- Share Capital- Phases of capital- Difference between Reserve capital and Capital Reserve- Shares and types of shares- Equity and Redeemable Preference shares - Convertible Cumulative Preference Shares (CCP shares) Sweat Equity shares- Employees Stock Option Scheme (Theory only)- Private Placement of shares- Issue of shares- Procedures- Minimum Subscription- Shares issued for consideration- Shares issued for consideration other than cash- Issue of shares at par and premium (issue at discount, not to be taught)- Treatment of Fraction shares- Application, Allotment and Calls on Shares- Share capital allotment- Calls in arrears and calls in advance- Interest on calls in arrears and calls in advance- Difference between calls in arrears and calls in advance- Oversubscription and under subscription- Pro-rata allotment- Forfeiture and reissue of shares- Annulment of forfeiture- Surrender of shares- Distinction between forfeiture and surrender- Journal entries- Practical problems.

Module III

Accounting for issue of Debentures: Definition – Types of debentures- Issue of Debentures- For cash, for consideration other than cash and issued as collateral security- Fraction debentures- Distinction between share and debenture- Terms of issue of debentures- Interest on debentures- Journal entries- Practical problems.

Module IV

Convergence to International Financial Reporting Standards: Meaning of Accounting Standards- need and importance of global accounting standards- Role of IASB in developing IFRS – components of IFRS (IAS,IFRS,IFRIC and SIC)- process of setting IFRS –Conceptual Framework and its contents – Definition of elements in financial statements- Criteria or principles of recognition, measurement, presentation and disclosure- convergence to IFRS- Emergence of Ind AS – Standard setting process in India – Role of NFRA –Entities required to adopt Ind AS- Role of FASB in developing US GAAP- Difference between Ind AS and IFRS.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module V

Ind. AS / IFRS complied Financial Statements of Companies (Ind AS1): **Preparation of final accounts under new format (SOPL, SOCE and SOFP – excluding SOCF)** - Treatment of adjustment items such as Corporate Dividend Tax- Transfer to Reserve- Provision for taxation- TDS on Interest income, implied adjustment of interest on loans and other usual adjustment items such as depreciation, Closing stock, provisions, outstanding, prepaid, accrued, and received in advance - Practical problems.

(Theory and problems may be in the ratio of 30% and 70% respectively)

Reference Books:

1. S.N. Maheshwari: Financial Accounting.
2. M.C. Shukla, T.S. Grewal and S.C. Gupta, Advanced Accounts, S.Chand & Co., New Delhi.
3. Naseem Ahmed, Nawab Ali Khan and M.L.Gupta: Fundamental of Financial Accounting, Ane Books Pvt. Ltd, New Delhi.
4. Grewal and Gupta: Advanced Accounting
5. Dr Goyal V.K., Financial Accounting, Excel Books, New Delhi.
6. R.L. Gupta and Radhaswamy, Advanced Accounting, Sultan Chand & Sons, New Delhi.
7. R.K.Malhotra: Financial Management in Hotels and Restaurant Industry, Anmol Publishers
8. S.Kr. Paul: Advanced Accounting
9. B.S. Raman, Advanced Accountancy.
10. Jain & Narang: Financial Accounting
11. Ashok Sehgal and Deepak Sehgal: Advanced Accounting, Volume 1, Taxmann, New Delhi.
12. Chintal Patel, Bhupendra Mantri, India Accounting Standards, Taxmann Publications.
13. T.P. Ghosh, Illustrated Guide to India Accounting Standards, Taxmann Publications

Marketing Management

BCM2C02 Marketing Management (Complimentary)

Module I

Marketing Management: The value of marketing–Core marketing concepts–**The new marketing realities–Philosophy of marketing - Creating long term loyalty relationships – Marketing management tasks – Analyzing consumer markets-Factors influencing consumer behaviour-Buying decision process - market segmentation**; bases for segmenting consumer markets – market targeting - marketing of services - rural marketing in India; potential, challenges and strategies.

Module II



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Creating and Capturing Value: The fundamentals of product management; product levels; customer value hierarchy– Classification of product–Managing brands and brand equity- Product and Services differentiation-Product and brand relationships - Product Life Cycle Marketing Strategies - New product development-Packaging, labeling, Warranties and Guarantees.

Pricing to capture value; setting the price; methods of pricing; pricing strategies; pricing for rural markets.

Module III

Delivering Value: Distribution -marketing channels and value networks-role of marketing channels-channel design and management decision-channel integration and system-conflict, cooperation and competition-Managing retailing, wholesaling and logistics-Direct and online marketing

Module IV

Communicating Value: Integrated Marketing Communications; role of marketing communication; developing effective communication; marketing communication mix - managing advertising; deciding on media and measuring effectiveness ; communicating to rural audience- Sales Promotion-Personal selling; principles of personal selling-Events and experiences-Public relation-Interactive marketing-word of mouth marketing.

Module V

E-commerce and E-marketing: Concept and nature; Reason for growth of e-marketing - E-commerce marketing practices; types of E-commerce; E-commerce business models; E-commerce marketing strategies - M-commerce marketing practices- Electronic Payment System-Security issues in E-commerce.

Reference Books:

1. Philip Kotler, Kevin Lane Keller, “Marketing Management” (15e), Pearson India Education Services Pvt Ltd
2. V S Ramaswamy & S Namakumari, “Marketing Management” (Latest Edition)- McGraw Hill Education (India) Private Limited, New Delhi
3. S.A. Sherlekar, “Marketing Management-Concepts and Cases”, Himalaya Publishing House Pvt Ltd
4. William J Stanton, “Fundamentals of Marketing”, McGraw Hill Publishing Co, New York
5. Lamb. Hair, McDaniel, —Marketing”, Cengage Learning Inc USA.
6. Rayport, Jeffrey F and Jaworksi. Bernard J, “Introduction to E-Commerce”, Tata Mc Graw Hill, New Delhi



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Professional Business Skills

BCM3A12 Professional Business Skills (Common)

Module I

Professionalism: Meaning -Definition – Characteristics - Traits and Qualities of a good professional - Professionalism in business - Professional Skills: important soft skills for business success- Professionalism in Communication: Verbal Communication: Professional Presentation - Different Presentation Postures- Written Communication: Email - Significance of Email in business – Email etiquette: format - rules – dos and don'ts - Technical Documentation: Standards – Types

Module II

E-Learning :Introduction of electronic learning - benefits and drawbacks of e-Learning - Online education - Digital age learners - Knowledge resources on internet - E-books, Audio, Video and other means for e-learning- Introduction to e-content development and tools - Online libraries – MOOCs - The e-Learning as a service Industry - major technologies used in e-earning- different approaches for e-Learning delivery - E-learning in India

Module III

Business Data Analysis : Features of New Generation Computers – Concept of data analysis – Business Data Analysis – Data Analyst – Types of analysts - organisation and source of data, importance of data quality, dealing with missing or incomplete data- Social Networking Analysis – Big Data Analysis - Role of Data Scientist in Business & Society - Role of Artificial Intelligence and Intelligent Agents in e-business - Ethical and Legal considerations in Business Analytics

Module IV

Socio - Cyber Informatics: IT and society - Digital Divide – Digital natives-Cyber space- New opportunities and threats - Cyber ethics - Cyber-crimes -Types - Cyber Laws – Organisations related with cyber laws-Cyber addictions - Information overload - Health issues - e-waste and Green Computing – Recent E-governance initiatives in India

Module V

Digital Marketing : Introduction to Digital marketing Environment –meaning & Concept – Need for digital marketing – Advantages and disadvantages of digital marketing -Trends in digital marketing- Types of digital marketing – Business models in digital marketing Business to Business (B2B), Business



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to Customer (B2C), Customer to Customer (C2C), Business to Employees (B2E), Business to Government (B2G) - Online advertising - types of online advertising - Top e-commerce websites around the world and its scenario in India. PPC (Pay per Click) advertising – Search engine Analytics – search engine ads – social media channels and ads

References Books:

1. Professional Business Skills – Lee Pelitz 2nd Edition
2. Peter Norton, Introduction to Computers, Tata McGraw Hill Private Limited, New Delhi, 2009.
3. Alan Evans, ITL ESL, Leslie Lamport, Dolores Etter, Darren George, Kenneth C Laoudon, Gary Rogers, Rainer Handel, INFORMATICS -Technology in Action, Pearson Education, Delhi, 2009.
4. V.Rajaraman, Introduction To Information Technology, PHI Learning Private Limited, New Delhi, 2009.
5. Daniel Minoli & Emma Minoli, Web Commerce Technology Hand Book, Tata McGraw Hill, New Delhi, 2009
6. Godfrey Parkin, Digital Marketing: Strategies for online success, New Holland publishers Ltd, 2009
7. Damian Ryan, Understanding Digital marketing: Marketing strategies for Engaging the Digital generation, Kogan page, 3rd Edition, 2014
7. Jonah Berger, Contagious Why things catch on, Simon & Schuster, 2013
8. Turban E, Armson, JE, Liang, TP & Sharda, Decision support and Business Intelligence Systems, 8th Edition, John Wiley & Sons, 2007
9. Frank J. Ohlhorst, Big Data Analytics, 1st Edition, Wiley, 2012.
10. Efraim Turban, Ramesh Sharda, Jay Aronson, David King, Decision Support and Business Intelligence Systems, 9th Edition, Pearson Education, 2009
11. Microsoft Office 2007 Business Intelligence - Reporting, Analysis, and Measurement from the Desktop, Doug Harts, TATA McGraw-Hill Edition, 2008
12. Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner, Galit Shmueli, Nitin R. Patel, Peter C. Bruce, Wiley Publication, 2010
13. Data Mining: Concepts and Techniques, Morgan Kaufmann Publication, 3rd Edition, 2011
- Data Science for Business – What you need to know about data mining and data-analytic thinking, Foster Provost, Tom Fawcett, O’Reilly Media Publication, 2013



CRITERION	I	Curricular Aspects
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Business Regulations

BCM3BO3 Business Regulations (Core)

Module I

- Business Laws : Introduction - Nature of Business Law - Meaning and definition -Indian Contract Act, 1872: Contract - Definition - Essentials of valid contracts - Classification of contracts - Offer and acceptance - Consideration - Capacity to contract - Free consent - Coercion - Undue influence - Misrepresentation - Fraud - Mistake - Void agreements - Discharge of contract - Breach of contract and remedies - Contingent contracts -Quasi contracts.

Module II

- Special Contracts: Contract of Indemnity: Meaning - Nature - Right of indemnity holder and indemnifier - Contract of Guarantee: Meaning - Nature - Rights and liabilities of surety - Discharge of surety from liability - Contract of Bailment and Pledge: Rights and duties of bailor and bailee, pledger and pledgee - Contract of Agency - Creation of agency - Delegation of authority - Duties and liabilities of principal and agent -Termination of agency.

Module III

- Sale of Goods Act 1930: Contract for sale of goods -Essentials of a contract of sale - Conditions and Warranties - Caveat emptor - Sale by non-owners - Rules as to delivery of goods - Un paid seller and his rights.

Module IV

- The Consumer Protection Act 1986: Objects and scope - Definition of consumer and consumer dispute - Complaint - Goods - Service - Unfair trade practices - Restrictive trade practices - Rights of consumers - Consumer Protection Council - Consumer Disputes Redressal Agencies.

Module V

- The limited liability partnership Act 2008 – Salient features – Distinction with partnership and company – LLP agreement – partners and designated partners – incorporation document – Extent and limitation of liability of LLP and partners.

Reference Books:

- Singh Avtar, The Principles of Mercantile Law , Eastern Book Company, Lucknow.
- Kuchal M.C, Business Law , Vikas Publishing House, New Delhi



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Kapoor N.D, Business Law , Sultan Chand & Sons, New Delhi.
4. Chandha P.R , Business Law.
5. S.S. Gulshan, Business Laws.
6. B. Sen and Mitra, Business and Commercial Laws.
- 7. Chandha P.R, Business Law, Galgotia, New Delhi.
- 8. Balchandani, Business Laws.
- 9. Desai T.R., Indian Contract Act, Sale of Goods Act and Partnership Act, S.C. Sarkar & Sons Pvt. Ltd. Kolkata.

Human Resources Management

BCM3C03 Human Resources Management (Complimentary)

Module I

Introduction to Human Resource Management—Importance--scope and objectives of HRM. Evolution of the concept of HRM- Approaches to HRM- Personal management Vs Human Resource Management- HRM and competitive advantage- Traditional Vs Strategic Human Resource Management - E-HRM - Operational E-HRM - Relational E-HRM - Transformational E-HRM.

Module II

Human resource planning, Recruitment and selection—Job analysis---process of job analysis- job discretion- job specification-- methods of job analysis-- Conventional Vs strategic planning—job evaluation—Recruitment--source of recruitment-methods.

Module III

Placement, Induction and Internal mobility of human resource. Training of employees—need for training- objectives- approaches --methods-training environment- areas of training- Training evaluation.

Module IV

Performance appraisal and career planning. Need and importance- objectives process- methods and problems of performance appraisal- . Concept of career planning –features- methods –uses career development

Module V

Compensation management and grievance redressal. Compensation planning objectives- Wage systems- factors influencing wage system-. Grievance redressal procedure- discipline- approaches-punishment- essentials of a good discipline system. Labour participation in management.



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References:

1. Human Resource Management- Text and Cases-- VSP Rao
2. Human Resource Management – Pravin Durai
3. Human Resource Management—Snell, Bohlander
4. Personal Management and Human Resources—VenkataRatnam .Srivasthava.
5. A Hand Book of Personnel Management Practice—Dale Yolder

Entrepreneurship Development

BCM4A13 Entrepreneurship Development (Common)

Module I

Concepts of entrepreneur: Entrepreneur- Definitions - Characteristics of entrepreneur- Classification of entrepreneur-Entrepreneurial traits -Entrepreneurial functions - role of entrepreneurs in the economic development - Factor effecting entrepreneurial growth – Entrepreneurship – Meaning – definition - Entrepreneur vs Intrapreneur - Women Entrepreneurs - Recent development – Problems - Entrepreneurial Development Programmes - Objectives of EDP - Methods of training - Phases of EDP.

Module II

Institutional support and incentives to entrepreneurs- Functions of Department of Industries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)- Functions of National Small Industries Corporation(NSIC)- Functions of Small Industries Development Bank of India (SIDBI) - Khadi Village Industry Commission (KVIC)-Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology Entrepreneurship Development Project (STEDP)-Strategies of National entrepreneurship Development Board (NEDB) - Objectives of National Institute for entrepreneurship and small business development (NIESBUD) - Techno park-Functions of techno park Incentives- Importance- Classification of incentives – Subsidy - Types of Subsidy

Module III

Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial estates-Classification-Benefits- Green channel- Bridge capital- Seed capital assistance-Margin money schemes –Single Window System- Sickness- Causes –Remedies- Registration of SSI

Module IV



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Setting up of Industrial unit-(Only Basic study) Environment for Entrepreneurship – Criteria for selecting particular project- Generating project ideas-Market and demand analysis- Feasibility study- Scope of technical feasibility- Financial feasibility- Social cost benefit analysis-Government regulations for project clearance-Import of capital goods- approval of foreign collaboration-Pollution control clearances- Setting up of micro small and medium enterprises-Location decision- Significance.

Module V

Project Report - Meaning-Definition - Purpose of project reports-Requirements of good report - Methods of reporting - General principles of a good reporting system - Performa of a project report - Sample project report. (The preparation of sample project report shall be treated as an assignment of this course).

Books Recommended:

1. Shukla M.B. Entrepreneurship and small Business Management, Kitab Mahal Allahabad.
2. Sangram Keshari Mohanty, Fundamentals of entrepreneurship, PHI, New Delhi.
3. Nandan H. Fundamentals of Entrepreneurship, PHI, New Delhi.
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing, Delhi
5. C.N.Sontakki, Project Management, Kalyani Publishers, Ludhiana.
6. Sangam Keshari Mohanty. Fundamentals of Entrepreneurship, PHI, New Delhi
7. Peter F. Drucker- Innovation and Entrepreneurship.
8. Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.
9. MSME Act 2006.

Accounting For Management

BCM5B07 Accounting for Management (Core)

Module I

Management Accounting: Nature and Scope - Difference between cost Accounting, Financial accounting and Management accounting - Recent trends in Management Reporting.

Module II

Analysis and Interpretation of Financial Statements: Meaning - Types and Methods of Financial Analysis - Comparative Statements - Trend Analysis - Common size Statements (a general discussion only).

(10 Hours, 10 marks)

Module III

Ratio Analysis: Meaning - Nature - uses and limitations of Ratios - Liquidity, Profitability, Turnover, Solvency, Leverage. Market test Ratios. Construction of Financial Statements from ratios – Judgment of financial stability through ratios - (Focus to be given to problems solving and Interpretation skills)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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(25 Hours, 25 marks)

Module IV

Fund Flow and Cash Flow Analysis:

A. Fund Flow Statements: Meaning and concept of Fund - Current and Non Current Accounts Flow of fund - Preparation of Fund Flow statement - Uses and Significance.

B. Cash Flow Statement: Difference between Fund flow Statement and Cash flow Statement - Preparation of Cash Flow Statement as per AS - 3 Norms - Direct and Indirect methods (Stress to be given to Problems).

(25 hours, 25 marks)

Module-V

Managerial Decision making with the help of CVP Analysis : Marginal Costing - Fixed Cost- Variable Cost - Contribution - P/V Ratio - Break Even Analysis - Algebraic and Graphic presentation - Decision making : Fixation of Selling Price - Exploring new markets - Make or Buy - Key Factor - Product Mix - Operate or Shutdown.

Reference Books:

1. Dr. S.N. Maheswari : Management Accounting.
2. Saxena : Management Accounting.
3. Made Gowda : Management Accounting.
4. Dr. S. N. Goyal and Manmohan : Management Accounting.
5. B.S.Raman: Management Accounting.
6. R.S.N. Pillai and Bagavathi : Management Accounting.
7. Sharma and Gupta : Management Accounting.
8. J. Batty : Management Accounting.
9. Foster: Financial Statement Analysis, Pearson Education.
10. P.N. Reddy & Appanaiah : Essentials of Management Accounting



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Business Research Methods

BCM5B08 Business Research Methods (Core)

Module I

Business Research: – Definition and significance - Features of business research – The research process – Variable - Proposition - Types of research – Exploratory and causal research – Theoretical and empirical research - Basic and applied research - Descriptive research - Phases of business research – Research Hypothesis – Characteristics – Research in an evolutionary perspective – Role of theory in research - Theory building - Induction and Deduction Theory.

Module II

Research Design – Definition – Types of research design – Exploratory and causal research design - Descriptive and experimental design – Types of experimental design – Validity of findings – Internal and external validity – Variables in research – Measurement and scaling – Different scales – Construction of instrument - Validity and reliability of instrument

Module III

Data Collection: - Types of data – Primary Vs secondary data – Methods of primary data collection – Survey Vs observation – Experiments – Construction of questionnaire and instrument – Validation of questionnaire – Sampling plan – Sample size – Sampling methods - Determinants of optimal sample size – Sampling techniques – Probability Vs non probability sampling methods.

Module IV

Data Processing: Processing stages - Editing - Coding and data entry – Validity of data – Qualitative Vs quantitative data analysis – Frequency table - Contingency table - Graphs - Measures of central tendency and index number – Testing of Hypothesis - Bivariate and multi variate statistical techniques – Factor analysis – Discriminant analysis- Cluster analysis – Interpretation.

Module V

Research Report: Different types – Contents of report – Need of executive summary – Chapterisation – Contents of chapter - Report writing stages – The role of audience – Readability – Comprehension – Tone – Final proof – Report format – Title of the report – Ethics in research – Subjectivity and objectivity in research.

Reference Books:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Donald R.Cooper and Pamela S, Schindler: Business Research Methods. Latest Edition, Irwin McGraw- Hill International Editions, New Delhi.
2. John Adams, Hafiz T.A. Khan Robert Raeside, David white: Research Methods for Graduate Business and Social Science Students, Response Books. New Delhi- 110044.
3. Neresh K. Malhotra: Marketing Research, Latest edition. Pearson Education.
4. William G. Zikmund, Business Research Methods, Thomson
5. Wilkinson T.S. and Bhandarkar P.L.: Methodology and Techniques of Social Research, Himalaya. 6. S N Murthy &. U Bhojanna: Business Research Methods, Excel Books, New Delhi.
7. Jan Brace: Questionnaire Design, Kogan Page India
8. Michael V.P. Research Methodology in Management, Himalaya.
9. Dipak kumar Bhattacharyya. Research Methodology. Excel Books, New Delhi.
10. R. Paneerselvan: Research Methodology, Prentice-Hall of India
11. Ajai S Gaur & Sanjaya S Gaur: Statistical Methods for Practice &. Research, Response Books, New Delhi.
12. Kultar Singh: Quantitative Social Research Methods. Response Books, New Delhi.

Auditing And Corporate Governance

BCM6B13 Auditing And Corporate Governance (Core)

Module I:

Auditing – Meaning – Objects - Basic Principles and Techniques – Auditing and investigation - Classification of Audit – Management audit – Proprietary audit – Performance audit – Tax audit – Social audit – Environmental audit - Audit Planning – Qualities of an auditor – Advantages and limitations of audit

Module II

Audit Procedures: Vouching - Definition - Features - Examining vouchers -Vouching of cash book - Vouching of trading transactions - Verification and valuation of assets and liabilities: Meaning - Definition and objects - Vouching v/s verification - Verification and Valuation of different assets and liabilities

Module III

Internal Control - Internal Check - Internal Audit --Definitions - Necessity - Difference between internal check and internal control - Fundamental Principles of internal check - Difference between internal check and internal audit - Special Areas of Audit: Tax audit and Management Audit - Recent trends in auditing



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- Relevant Auditing and Assurance Standards (AASs) - Rights duties and liabilities of auditor - Audit committee - Auditor's Report - Contents and types – Auditors certificate.

Module IV: Conceptual Framework of Corporate Governance: Meaning, Theories, Models and Benefits of Corporate Governance; Board Committees and their Functions; Insider Trading; Rating Agencies; Green Governance/E-governance; Clause 49 of Listing Agreement; Class Action; Whistle Blowing; Shareholders Activism

Module V

Major Corporate governance failures - BCCI (UK) - Maxwell Communication (UK) - Enron (USA – Satyam Computer Services Ltd - TATA Finance - Kingfisher Airlines - Common Governance Problems Noticed in various Corporate Failures - Codes and Standards on Corporate Governance

Suggested Readings:

1. Institute of Chartered Accountants of India, Auditing and Assurance Standards, ICAI, New Delhi. 2. Relevant Publications of ICAI on Auditing (CARO).
3. Gupta, Kamal and Ashok Arora, Fundamentals of Auditing, Tata Mc-Graw Hill Publishing Co. Ltd.,
4. Ghatalia, S.V., Practical Auditing, Allied Publishers Private L td., New Delhi.
5. Singh, A. K. and Gupta Lovleen, Auditing Theory and Practice, Galgotia Publishing Company.
6. Mallin, Christine A., Corporate Governance (Indian Edition), Oxford University Press, New Delhi.
7. Rani, Geeta D., and R.K. Mishra, Corporate Governance- Theory and Practice, Excel Books, New Delhi.
8. Bob Tricker, Corporate Governance-Principles, Policies, and Practice (Indian Edition), Oxford University Press, New Delhi.
9. Sharma, J.P., Corporate Governance, Business Ethics, and CSR, Ane Books Pvt Ltd, New Delhi.



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Fundamentals Of Investments

BCM6B14 Fundamentals Of Investments (Specialization)

Module I

Introduction to Investment - Meaning of Investment – essential features of Investment Investment Alternatives- Investment Environment (brief description on elements such as Financial Securities, Financial Markets, Financial Services, Financial Intermediaries, Regulators, and Investors) –Investment Management Process –Sources of Financial Information- Calculation of return on investment and expected return-Calculation of expected return under CAPM- Types of risk- Calculation of Standard deviation- calculation of beta under correlation and regression methods (Simple Problems).

(15 Hours, 18 marks)

Module II

Security Valuation: a) Valuation of Fixed Income Securities: Bonds- Essential Features- Types of Bonds- Types of bond risks- estimating Bond Yields-Bond valuation (redeemable and irredeemable)- Valuation of Preference Shares (redeemable and irredeemable). b) Valuation of Equity- Dividend Yield Method- Dividend Yield plus growth method (singlestage growth and multi-stage growth) - Discounted Cash Flow method-P/E multiple approach.

(20 Hours, 20 Marks)

Module III

Approach to Security Analysis: Security Analysis- Fundamental Analysis – EIC analysis – Tools for company analysisTechnical Analysis- stock charts(line, bar, candle stick and point and figure charts)- Support and Resistance levels- Trends and Trend Reversals – Patterns -continuation patterns(Triangles, Rectangles, Flags and Pennants) -reversal patterns(head and shoulders, double tops and double bottom, wedges)- Indicators -a brief description on leading and lagging indicators)- brief description of DOW theory and Elliot Wave theory.

(20 Hours, 20 Marks)

Module IV

Portfolio Analysis: Concept of portfolio – need and importance- portfolio diversification- a brief description of Markowitz model, Random Walk Theory, Efficient Market Hypothesis, Efficient Portfolio -Calculation of Portfolio Risk with two securities (Covariance, Correlation, Standard deviation)- Portfolio Return

(15 Hours, 12 Marks)

Module V

Investor Protection: Role of SEBI & Stock Exchanges in investor protection – Investor Education & Awareness Measures- Investor grievances and their redressal system – SCORES – Prohibition of Insider trading practices - UPSI-Rights and Duties of Investors - Investor activism.

(10 Hours, 10 marks)



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(Theory and problems may be in the ratio of 50% and 50% respectively)

Reference Books:

1. Donald E. Fisher and Ronald J. Jordan: Securities Analysis and Portfolio Management, Prentice Hall, New Delhi.
2. S. Kevin: Security Analysis and Portfolio Management.
3. Sourain. Harry; Investment Management, Prentice Hall of India.
4. Francis and Archer: Portfolio Management, Prentice Hall of India.
5. Gupta L.C.: Stock Exchange Trading in India, Society for Capital Market Research and Development, Delhi.
6. MachiRaju, H.R.: Working of Stock Exchanges in India, Wiley Eastern Ltd, New Delhi



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Physical And Applied Chemistry

CHE4C04 Physical and Applied Chemistry

Module I: Colloidal Chemistry (6 hrs.)

True solution, colloidal solution and suspension. Classification of colloids: Lyophilic, lyophobic, macromolecular, multimolecular and associated colloids with examples. Purification of colloids by electrodialysis and ultrafiltration. Properties of colloids: Brownian movement – Tyndall effect – Electrophoresis. Origin of charge and stability of colloids – Coagulation - Hardy Schulze rule – Protective colloids - Gold number. Emulsions. Applications of colloids: Delta formation, medicines, emulsification, cleaning action of detergents and soaps.

References

1. B. R. Puri, L. R. Sharma, M. S. Pathania, Principles of Physical Chemistry, 46th Edn., Vishal Publishing Company, New Delhi, 2013.
2. F. Daniels, R. A. Alberty, Physical Chemistry, 5th Edn., John Wiley and Sons, Canada, 1980.

Module II: New Vistas in Chemistry (6 hrs)

Nanochemistry: Introduction – classification of nanomaterials (0D, 1D, 2D) - size dependence of material properties (optical, electrical and catalytic) - surface to volume ratio and its significance - application of nanomaterials in electronics, optics, catalysis and medicine (detailed discussion not expected).

Green Chemistry: Definition and need of green chemistry - principles (detailed discussion not expected) - atom economy - green solvents - green synthesis of Ibuprofen.



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References

1. M. A. Shah, Tokeer Ahmad, *Principles of Nanoscience and Nanotechnology*, Narosa Publishing House, New Delhi, 2010.
2. T. Pradeep, *A Textbook of Nanoscience and Nanotechnology*, McGrawhill, New Delhi, 2012.
3. V. K. Ahluwalia, *Green Chemistry*, Narosa Publishing House, New Delhi, 2011.

Module III: Chromatography (6 hrs)

Chromatography- Introduction - Adsorption and partition chromatography - Principle and applications of column, thin layer, paper and gas chromatography - Rf value – Relative merits of different techniques.

References

1. R. A. Day Junior, A. L. Underwood, *Quantitative Analysis*, 5th Edn., Prentice Hall of India Pvt. Ltd., New Delhi, 1988.
2. J. Mendham, R. C. Denney, J. D. Barnes, M. Thomas, *Vogel's Text Book of Quantitative Chemical Analysis*, 6th Edn., Pearson Education, 2003.
3. R. Gopalan, P. Subramanian, K Rengarajan, *Elements of Analytical Chemistry*, S. Chand and Co., New Delhi, 2004.
4. R. P. Budhiraja, *Separation chemistry*, New Age International (P) Ltd., 2007.

Module IV: Spectroscopy (10 hrs)

Origin of spectra - Interaction of electromagnetic radiation with matter. Different types of energy levels in molecules: Rotational, vibrational and electronic levels. Statement of Born- Oppenheimer approximation - Fundamental laws of spectroscopy and selection rules (derivations not required).



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IR Spectroscopy: Introduction - Group frequency concept - Characteristic stretching frequencies of O-H, N-H, C-H, C=C, C=N and C=O functional groups - Fingerprint region in IR spectra.

UV-Visible Spectroscopy: Introduction - Beer-Lambert's law - Electronic transitions in molecules ($\sigma \rightarrow \sigma^*$, $n \rightarrow \sigma^*$, $\pi \rightarrow \pi^*$ and $n \rightarrow \pi^*$) - Chromophore and auxochrome - Red shift and blue shift.

NMR Spectroscopy: Introduction - Chemical shift and spin-spin coupling - Application in elucidating the structure of ethanol, dimethyl ether, propanal and acetone (detailed study not required).

References

1. P. S. Kalsi, Applications of Spectroscopic Techniques in Organic Chemistry, 6th Edn., New Age International (P) Ltd., New Delhi, 2004
2. C. N. Banwell, E. M. Mc Cash, Fundamentals of Molecular Spectroscopy, 4th Edn., McGraw-Hill publishing Company Limited, New Delhi, 2002.

Module V: Polymers (4 hrs)

Classification of polymers - Addition and condensation polymers – Thermoplastics and thermosetting plastics - Structure and applications of synthetic rubbers (Buna-S, Buna-N and neoprene), synthetic fibres (Nylon 66, Nylon 6 and dacron), thermoplastics (polyethene, polystyrene, PVC and teflon) and thermosetting plastics (bakelite and melmac). Uses of kevlar, nomex and lexan – Biodegradable polymers (PGA, PLA and PHBV) and their applications.

References

1. V. R. Gowarikar, *Polymer Chemistry*, New Age International Pvt. Ltd., New Delhi, 2010.
2. Fred. W. Billmeyer, *Textbook of Polymer Science*, 3rd Edn., Wiley India, Delhi, 2008.

Module VI: Environmental Pollution

Definition – Types of pollution.

Air pollution: Pollution by oxides of nitrogen, carbon and sulphur. Effects of air pollution: Depletion of ozone, green house effect and acid rain.



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Water pollution: Pollution due to sewage, industrial effluents, soaps, detergents, pesticides, fertilizers and heavy metals – Eutrophication - Biological magnification and bioaccumulation - Effects of water pollution. Water quality parameters – DO, BOD and COD (elementary idea only).

Soil pollution – Pollution due to plastics.

Thermal pollution and radioactive pollution: Sources, effects and control measures. (E & S)

References

1. A. K. De, *Environmental Chemistry*, 6th Edn., New Age International Pvt. Ltd., New Delhi, 2006.
2. A. K. Ahluwalia, *Environmental Chemistry*, Ane Books India, New Delhi, 2008.

Module VII: Chemistry in Daily Life

Petrochemicals: Name, carbon range and uses of fractions of petroleum distillation – Octane number - Cetane number – Flash point. LPG and CNG: Composition and uses. *Pharmaceuticals*: Drug - Chemical name, generic name and trade names with examples. Antipyretics, analgesics, antibiotics, antacids, antiseptics (definition and examples, structure not expected).

Dyes: Definition – Requirements of a dye - Theories of colour and chemical constitution – Structure and applications of martius yellow, indigo and alizarin.

Food: Food additives: Food preservatives, artificial sweeteners and antioxidants (definition and examples, structures not required) Commonly used permitted and non-permitted food colours (structures not required).

Cement: Manufacture, composition and setting.

Glass: Types of glasses and uses.

References

1. Gurdeep R. Chatwal, *Synthetic Drugs*, Himalaya Publishing House, Bombay, 1995.
2. Jayashree Ghosh, *A Textbook of Pharmaceutical Chemistry*, 3rd Edn., S. Chand and Company Ltd., New Delhi, 1999.
3. B. Sivasankar, *Food processing and preservation*, Prentice – Hall of India Pvt. Ltd., New Delhi, 2002.



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Advanced And Applied Chemistry

CHE6B12 Advanced and Applied Chemistry

Nanochemistry

Historical introduction to nanochemistry - Nanosize domain - Classification of nanomaterials (0D, 1D and 2D) - Size dependence of material properties - Surface area to volume ratio and its significance - Variation in electronic and optical properties. Introduction to metal nanoparticles (gold, silver and platinum nanoparticles), semiconductor nanoparticles or quantum dots (CdS and CdSe nanoparticles) and metal oxide nanoparticles (zinc oxide, iron oxide, silica and titania nanoparticles). Carbon nanostructures: Fullerenes, carbon nanotubes and graphene (elementary idea only). Applications of nanomaterials in electronics, optics, catalysis, medicine and in environment related issues (detailed discussion not required).

Module II

NEW VISTAS IN CHEMISTRY (9 hrs)

Green Chemistry: Introduction - Environmental concern on chemical industry and need of green chemistry – Origin of green chemistry – Twelve principles of green chemistry with explanations - Atom economy and microwave assisted reactions - Green solvents - Green synthesis of ibuprofen. Microwave and ultrasound assisted green synthesis: Aldol condensation, Diels-Alder reaction and Williamson's synthesis.

Supramolecular Chemistry: Introduction – Concepts of primary and secondary structures with examples (structures of protein and DNA) - Molecular recognition - Host-guest interactions - Types of noncovalent interactions.

Combinatorial Chemistry: Introduction – Combinatorial synthesis (elementary idea only). Applications of combinatorial synthesis in drug discovery (brief study).

Module III



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INTRODUCTION TO COMPUTATIONAL CHEMISTRY (6 hrs)

General Introduction to Computers: Operating systems and programming languages (basic idea only).

Excel Spread Sheets: Basic operations, functions, charts and plots - Linear and non-linear regression - Curve fitting.

Conceptual Background of Molecular Modeling: Molecular mechanic (force field) and molecular orbital (ab initio and semi-empirical) methods for molecular geometry optimization and computation of basic molecular properties (elementary idea only).

Module IV

SYNTHETIC POLYMERS (6 hrs)

Classification - Tacticity – Monomers, structural formula and applications of addition polymers (polyethene, polystyrene, PVC, teflon, PAN, PMMA, polyacetylene, Buna S, Buna N and neoprene) and condensation polymers (nylon 66, nylon 6, bakelite, melmac, terylene, kevlar, lexan and nomex) - Advantages of Ziegler Natta polymerization (mechanism not expected) - Plastic identification codes. Biodegradable polymers: PGA, PLA and PHBV.

Module V

APPLIED INORGANIC CHEMISTRY (9 hrs)

Cement (manufacture, composition and setting) - Glass (manufacture, annealing, types of glasses and uses) - Refractory materials (borides and carbides) - Inorganic fertilizers - Essential nutrients for plants - Nitrogenous, phosphatic and potash fertilizers - Rocket propellants (classification with examples) - Composition and health effect of toothpaste and talcum powder.

Chemical industries in Kerala: Location, raw materials, chemistry involved in the preparation and uses of the following.

Fertilizers and Chemicals Travancore Ltd.: Ammonium sulphate.

Travancore Cochin Chemicals Ltd.: Caustic soda and chlorine.

Malabar Cements Ltd.: Cement.



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Steel Complex Ltd.: Various grades of steel billets.

Travancore Titanium Products Ltd.: Titanium dioxide pigment from ilmenite.

Module VI

APPLIED ORGANIC CHEMISTRY – I (9 hrs)

Petroleum: Carbon range and uses of various fractions of petroleum distillation – Petrol - Knocking - Octane number – Anti-knocking compounds – Diesel oil - Cetane number – Flash point – Composition and uses of LPG and CNG.

Pharmaceuticals: Medicinal chemistry - Drugs (chemical, generic and trade names with examples).

Terminology: Prodrug, pharmacy, pharmacology, pharmacophore, pharmacognosy, pharmacodynamics and pharmacokinetics (elementary idea only). Antipyretics, analgesics, antacids, antihistamines, antibiotics, antiseptics, disinfectants, anesthetics, narcotics, tranquilizers, antidepressants and psychedelic drugs (definition and examples, structures not expected) - Preparation of paracetamol and aspirin.

Cleansing Agents: Soaps and detergents: Preparation, classification, advantages and disadvantages – TFM - Cleaning action – Composition of shaving creams. Shampoos: Ingredients and functions. Different kinds of shampoos: Anti-dandruff, anti-lice, herbal and baby shampoos. Health effects of shampoos.

Pesticides: Insecticides, herbicides, rodenticides and fungicides (definition and examples) – Structure of Endosulfan, DDT and BHC - Harmful effects of pesticides. Endosulfan disaster in Kerala (brief study).

Module VII

APPLIED ORGANIC CHEMISTRY – II (9 hrs)

Dyes: Definition - Requirements of a dye - Theories of colour and chemical constitution - Classification based on structure and mode of application to the fabric - Preparation and uses of Rosaniline and Indigo.

Cosmetics: Chemicals used in and health effects of hair dye, perfumes, antiperspirants, cleansing creams (cold creams, vanishing creams and bleach creams), sun screen preparations, UV absorbers, skin



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bleaching agents, depilatories, nail polishes, lipsticks and eye liners - Turmeric and Neem preparations - Vitamin oil. Harmful effects of cosmetics.

Food Chemistry: Common food adulterants in various food materials and their identification: Milk, vegetable oils, tea, coffee powder, rice and chili powder. Methods of preservation: Drying, pasteurization, refrigeration, vacuum packing, use of salt and pickling. Food additives: Food preservatives, artificial sweeteners and antioxidants (definition and examples, structures not required) - Structure of BHT, BHA and Ajinomoto – Common permitted and non-permitted food colours (structures not required) – Artificial ripening of fruits and its health effects. Modern food: Definition and health effects of fast foods, instant foods, dehydrated foods, junk foods and condiments - Composition and health effects of chocolates and soft drinks. Harmful effects of modern food habits. Natural food: Composition and advantages of milk - Importance of regional and seasonal fruits – Composition, importance and medical uses of coconut water and Neera - Advantages of traditional Kerala foods.

Text Books

1. M.A. Shah and Tokeer Ahmad, Principles of Nanoscience and Nanotechnology, Narosa Publishing House, New Delhi, 2010.
2. V.K. Ahluwalia, Green Chemistry, Narosa Publishing House, New Delhi, 2011.
3. P.S. Kalsi and J.P. Kalsi, Bioorganic, Bioinorganic and Supramolecular Chemistry, 1st Edition, New Age International Publishers (P) Ltd., New Delhi, 2007.
4. W. Bannwarth and B. Hinzen, Combinatorial Chemistry - From Theory to Application, 2nd Edition, Wiley-VCH, 2006.
5. E. Joseph Billo, Excel for Chemists - A Comprehensive Guide, 3rd Edition, John Wiley & Sons, Inc., Hoboken, New Jersey, 2011.
6. Andrew R. Leach, Molecular Modelling: Principles and Applications, 2nd Edition Prentice Hall, 2001.
7. V.R. Gowarikar, Polymer Chemistry, New Age International (P) Ltd., New Delhi, 2010.



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8. B.R. Puri, L.R. Sharma and K.C. Kalia, Principles of Inorganic Chemistry, 31st Edition, Milestone Publishers and Distributors, New Delhi, 2013.
9. K.S. Tewari, N.K. Vishnoi and S.N. Mehrotra, A Textbook of Organic Chemistry, 2nd Edition, Vikas Publishing House (Pvt.) Ltd., New Delhi, 2004.
10. Gurdeep R. Chatwal, Synthetic Drugs, Himalaya Publishing House, Bombay, 1995.
11. M.S.R. Winter, A Consumer's Dictionary of Cosmetic Ingredients, 7th Edition, Three Rivers Press, New York, 2009.
12. H.S. Rathore and L.M.L. Nollet, Pesticides: Evaluation of Environmental Pollution, CRC Press, USA, 2012.
13. B. Srilakshmi, Food Science, 5th Edition, New Age Publishers, New Delhi, 2010.

References

- T. Pradeep, A Textbook of Nanoscience and Nanotechnology, McGrawhill, New Delhi, 2012.
- V.S. Muralidharan and A. Subramania, Nano Science and Technology, CRC Press, London, 2008.
- Andrew P. Dicks, Green Organic Chemistry in Lecture and Laboratory, CRC Press, University of Toronto, Ontario, Canada, 2011.
- M. Kirchhoff and M. Ryan, Greener Approaches to Undergraduate Chemistry Experiments, American Chemical Society, Washington, DC, 2002.
- Helena Dodziuk, Introduction to Supramolecular Chemistry, Springer, New York, 2002.
- A.W. Czarnik and S.H. DeWitt, A Practical Guide to Combinatorial Chemistry, 1st Edition, American Chemical Society, 1997.
- John Walkenbach, Excel 2013 Formulas, 1st Edition, Wiley, New York, 2013.
- S. Wilson, Chemistry by Computer: An Overview of the Applications of Computers in Chemistry, Plenum Publishing, New York, 1986.
- Fred W. Billmeyer, Jr., Textbook of Polymer Science, 3rd Edition, John Wiley & Sons, Singapore, 1994.
- P.L. Soni and Mohan Katyal, Textbook of Inorganic Chemistry, 20th Edition, S. Chand and Sons, New Delhi, 2013.



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Jayashree Ghosh, A Textbook of Pharmaceutical Chemistry, 3rd Edition, S. Chand and Company Ltd., New Delhi, 1999.

G. Thomas, Fundamentals of Medicinal Chemistry, John Wiley & Sons Ltd., 2006.

B. Siva Sankar, Food Processing and Preservation, Prentice–Hall of India Pvt. Ltd., New Delhi, 2002.

Medicinal and Environmental Chemistry

CHE6B13(E3) Medicinal and Environmental Chemistry

Module I

HEALTH AND BIOCHEMICAL ANALYSIS (6 hrs)

Definition of health - WHO standard - Sterilization of surgical instruments - Biochemical analysis of urine and serum.

Blood: Composition, grouping and Rh factor - Blood transfusion.

Module II

DRUGS (6 hrs)

Definition – History of drugs – Prodrug – Prescription and non-prescription drugs – Routes of drug administration - Drug dosage - Effective use of drugs – Over dosage - Drug toxicity – Thalidomide tragedy (a brief study) – Drug abuse.

Assay of Drugs: Chemical, biological and immunological assays - LD50 and ED50 therapeutic index. Indian Medicinal Plants: Kizharnelli, Thumbai, Hibiscus, Adathodai, Nochi, Thulasi, Brahmi, Aloe Vera and Neem plant (Major chemical constituents and medicinal uses).

Module III

COMMON DISEASES AND TREATMENT (12 hrs)

Diseases - Communicable and non-communicable diseases - Causes, symptoms and drugs used for the treatment of air-borne diseases (anthrax, chickenpox, influenza, measles and tuberculosis), water and food



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borne diseases (cholera, dysentery, typhoid fever and hepatitis A), bronchial asthma, kidney stone, diabetes, myocardial infarction and AIDS – Drugs used in the treatment for systemic hypertension and hypercholesterolemia.

Cancer: Definition - Lung cancer (causes, symptoms and treatment) – Avenues for the treatment of terminal cancer.

Treatment for Specific Poisons: Snake bite, arsenic and mercury compounds.

Module IV

ENVIRONMENTAL TOXICOLOGY (6 hrs)

Introduction – Threshold Limiting Value – Source and toxicological effects of inorganic compounds (H₂S, Cl₂ and asbestos), organic compounds (CCl₄, phenol, benzene, phenylene diamines, nitroso amines and p-dichlorobenzene), persistent organic pollutants (dioxins, TCDD, pesticides: Endosulphan, carbaryl and DDT), phthalates and heavy metals (As and Hg).

Module V

CONTROL AND MONITORING OF AIR POLLUTANTS (12 hrs)

Air Pollution Control Measures: Gravitational settling chamber, fabric filter, wet scrubber, catalytic converters, stacks and chimneys, cyclone collectors, Cottrell electrostatic precipitator, extraction ventilator, zoning and green belt.

Air Pollutant Monitoring: Sampling methods for particulate analysis - Filtration, sedimentation, electrostatic samplers, thermal precipitators and impingers. Sampling methods for gases and vapours – Cold trapping, absorption and adsorption. Analytical methods for the determination of CO, NO_x, SO_x, H₂S, hydrocarbons and particulate matter.

Module VI

WATER TREATMENT PROCESSES (12 hrs)

Types and characteristics of industrial waste water - Aerobic and anaerobic oxidation - Sedimentation, coagulation, filtration, disinfection, desalination and ion exchange. Primary treatment - Secondary treatment - Trickling filters, activated sludge process and sludge digestion - Tertiary



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treatment - USAB process and deep well injection. Sewage and sewage analysis - Total solids, settleable solids, suspended solids, dissolved oxygen, BOD (Winkler's titration method and dissolved oxygen meter) and COD - Protection of surface waters from pollution with industrial sewage.

Use and conservation of water resources – Rain water harvesting - Sea water for agriculture.

References

1. G. Thomas, Fundamentals of Medicinal Chemistry, John Wiley & Sons Ltd., London, 2003.
2. Guyton and Hall, Textbook of Medical Physiology, 12th Edition, Saunders, US, 2010.
3. D.J. Abraham, Burger's Medicinal Chemistry and Drug Discovery, Vol.1-6, WileyInterscience, Hoboken, NJ, 2003.
4. B.L. Oser, Hawk's Physiological Chemistry, Tata McGraw-Hill Publishing Co. Ltd., New Delhi, 1979.
5. S.C. Rastogi, Biochemistry, 2nd Edition, Tata McGraw Hill Publishing Co., New Delhi, 2007 (Reprint).
6. Gurdeep R. Chatwal, Synthetic Drugs, Himalaya Publishing House, Bombay, 1995.
7. Jayashree Ghosh, A Textbook of Pharmaceutical Chemistry, 3rd Edition, S. Chand and Company Ltd., New Delhi, 1999.
8. Rasheeduz Zafar, Medicinal Plants of India, 1st Edition, CBS Publishers & Distributors Pvt. Ltd., New Delhi, 2009.
9. A.K. De., Environmental Chemistry, 6th Edition, New Age International (P) Ltd., New Delhi, 2006.
10. M.L. Davis, D.A. Cornwell, Introduction to Environmental Engineering, 3rd Edition, McGraw Hill, New Delhi, 1998.
11. S.E. Manahan, Environmental Chemistry, 8th Edition, CRC Press, Florida, 2004.
12. G.M. Masters, Introduction to Environmental Engineering and Science, 3rd Edition, Prentice-Hall Inc., New Delhi, 2007.
13. A.K. Ahluwalia, Environmental Chemistry, Ane Books India, New Delhi, 2008.
14. B.K. Sharma and H. Kaur, Environmental Chemistry, Goel Publishing House, Meerut, 1996.



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Reaction Mechanism In Organic Chemistry

CHE2C07 - Reaction Mechanism In Organic Chemistry

Unit 1: Aliphatic and Aromatic Substitutions (9 h)

Nucleophilic Aliphatic Substitution: Mechanism and Stereochemistry of SN2 and SN1 reactions. Ion-pair mechanism. The effect of substrate structure, reaction medium, nature of leaving group and nucleophile on SN2 and SN1 reactions. SNi and neighboring group mechanism. SET mechanism. Allylic and benzylic substitutions. Ambident nucleophiles and substrates regioselectivity. Electrophilic Aliphatic Substitution: Mechanism and stereochemistry of SE1, SE2 (front), SE2 (back) and SEi reactions. The effect of substrate structure, leaving group and reaction medium on SE1 and SE2 reactions. Electrophilic Aromatic Substitution: Arenium ion mechanism, substituent effect on reactivity in mono and disubstituted benzene rings, ortho/para ratio, Ipso substitution. Relationship between reactivity and selectivity. Nucleophilic Aromatic substitution: Addition-elimination (SNAr) mechanism, elimination-addition (benzyne) mechanism, cine substitution, SN1 and SRN1 mechanism. The effect of substrate structure, nucleophile and leaving group on aromatic nucleophilic substitution.

Unit 2: Addition & Elimination Reactions and Reactive Intermediates (9h)

(i) Addition and Elimination Reactions (6h)

Mechanistic and stereochemical aspects of addition to C=C involving electrophiles, nucleophiles and free radicals. Effect of substituents on the rate of addition, orientation of addition, addition to conjugated systems and cyclopropane rings,

Michael reaction Mechanistic and stereochemical aspects of E1, E1cB and E2 eliminations. The effect of substrate structure, base, leaving group and reaction medium on elimination reactions. Saytzev vs Hofmann elimination, α -elimination, pyrolytic syn elimination (Ei) and conjugate eliminations. Competition between substitution and elimination reactions, basicity vs nucleophilicity. Extrusion reactions- extrusion of N2, CO and CO2.

(ii) Reactive Intermediates (3hrs)

Reactive Intermediates: Generation, geometry, stability, and reactions of carbonium ions and carbanions, free radicals, carbenes, nitrenes and benzyne.

Unit 3: Chemistry of Carbonyl Compounds (9h)

(i) Reactions of Carbon-heteromultiple Bonds (7h)



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Reactivity of carbonyl compounds toward addition, mechanistic aspects of hydration, addition of alcohols, and condensation with nitrogen nucleophiles to aldehydes and ketones. Addition of organometallic reagents- Grignard reagents- organozinc, organocopper and organolithium reagents- to carbonyl compounds. Aldol, Perkin, Claisen, Dieckmann, Stobbe, and benzoin condensation. Darzen's, Knoevenagel, Reformatsky, Wittig, Cannizzaro, Mannich, and Pinacol's reactions. MPV reduction and Oppenauer oxidation. Addition to carbon-nitrogen multiple bonds: Ritter reaction and Thorpe condensation. Hydrolysis, alcoholysis, and reduction of nitriles. (ii) Esterification and Ester Hydrolysis (2h): Mechanisms of ester hydrolysis and esterification, Acyl-oxygen and alkyl oxygen cleavage.

Unit 4: Pericyclic Reactions (9 h)

Phase and symmetry of molecular orbitals, FMOs of ethylene, 1, 3- butadiene, 1, 3,5- hexatriene, allyl, and 1, 3-pentadienyl systems. Pericyclic reactions: electrocyclic, cycloaddition, sigmatropic, chelotropic and group transfer reactions. Theoretical models of pericyclic reactions: TS aromaticity method (Dewar-Zimmerman approach), FMO method and Correlation diagram method (Woodward-Hoffmann approach). Woodward- Hoffmann selection rules for electrocyclic, cycloaddition and sigmatropic reactions. Stereochemistry of Diels- Alder reactions and regioselectivity. Cope and Claisen rearrangements. Stereochemistry of cope rearrangement and valence tautomerism. 1, 3- dipolar cycloaddition reactions and ene reactions.

Unit 5: Photochemistry of Organic Compounds (9 h)

Photochemical excitation of molecules, spin multiplicity, Jablonski diagram, photosensitization, and quenching. Photochemistry of carbonyl compounds: Norrish type- I cleavage of acyclic, cyclic and β , γ -unsaturated carbonyl compounds, β -cleavage, γ - hydrogen abstraction: Norrish type- II cleavage, photo reduction, photoenolization. Photocyclo- addition of ketones with unsaturated compounds: Paterno-Büchi reaction, photodimerization of α , β - unsaturated ketones, Photo rearrangements: Photo -Fries, di- π - methane, lumi ketone, oxa di- π - methane rearrangements. Barton and Hoffmann- Loeffler- Freytag reactions. Photo isomerization and dimerization of alkenes, photo isomerization of benzene and substituted benzenes, photooxygenation.

Unit 6: Chemistry of Natural Products (9 h)

Chemical classification of natural products. Classification of alkaloids based on ring structure, isolation and general methods of structure elucidation based on degradative reactions. Structures of atropine and quinine. Terpenoids - Isolation and classification of terpenoids, structure of steroids classification of steroids. Woodward synthesis of cholesterol, conversion of cholesterol to testosterone. Total synthesis of Longifolene, Reserpine, Cephalosporin. Introduction to flavonoids and anthocyanins (Structures only)



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References:

1. M. B. Smith and J. March, March's Advanced Organic Chemistry, 6/e, John Wiley & Sons, 2007.
2. F. A. Carey and R. J. Sundburg, Advanced Organic Chemistry, Part A & B, 5/e, Springer, 2007.
3. E. V. Anslyn and D. A. Dougherty, Modern Physical Organic Chemistry, University Science Books, 2005.
4. T. H. Lowry and K. S. Richardson, Mechanism and Theory in Organic Chemistry, 3/e Addison-Wesley, 1998.
5. R. O. C. Norman and J. M. Coxon, Principles of Organic Synthesis, 3/e, CRC Press, 1998.
6. Peter Sykes, A Guide book to Mechanism in Organic Chemistry, 6/e, Pearson, 2006.
7. S. Sankararaman, Pericyclic Reactions-A Textbook: Reactions, Applications and Theory, Wiley VCH, 2005.
8. I. Fleming, Molecular Orbitals and Organic Chemical Reactions, Wiley, 2009.
9. J. Sing and J. Sing, Photochemistry and Pericyclic Reactions, 3/e, New Age International, 2012.
10. G. M. Loudon, Organic Chemistry, 4/e, Oxford University Press, 2008
11. M. B. Smith, Organic Chemistry: An Acid Base Approach, CRC Press, 2010.
12. T. Okuyama and H. Maskill, Organic Chemistry A Mechanistic Approach, Oxford University Press, 2014.
13. I. Fleming, Selected Organic Synthesis, John Wiley and Sons, 1982.
14. T. Landbery, Strategies and Tactics in Organic Synthesis, Academic Press, London, 1989.
15. E. Corey and I.M. Chang, Logic of Chemical Synthesis, John Wiley, New York, 1989.
16. I. L. Finar, Organic Chemistry Vol 2: Stereochemistry and the Chemistry of Natural Products, 5/e, Pearson, 2006.
17. N. R. Krishnaswamy, Chemistry of Natural Products: A Laboratory Hand Book, 2/e, Universities Press



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Inorganic Chemistry Practicals– I & II

CHE2L04 – Inorganic Chemistry Practicals– I & II

UNIT 1: Inorganic Cation Mixture Analysis Separation and identification of four metal ions of which two are less familiar elements like W, Se Te, Mo, Ce, Th, Ti, Zr, V, U, and Li. (Eliminating acid radicals not present). Confirmation by spot tests.

UNIT 2: Volumetric Analysis Volumetric Determinations using:

(a) EDTA (Al, Ba, Ca, Cu, Fe, Ni, Co, hardness of water)

(b) Cerimetry (Fe²⁺, nitrite)

(c) Potassium Iodate (Iodide, Sn²⁺)

UNIT 3: Colorimetric Analysis Colorimetric Determinations of metal ions Fe, Cr, Ni, Mn, and Ti.

References

1. G.H. Jeffery, J. Basset, J. Mendham and R.C. Denny, Vogel's Text book of Quantitative Chemical Analysis, 5th Edition, ELBS, 1989.
2. D.A. Skoog and D.M. West, Analytical Chemistry, an Introduction, 4th Edition, CBS Publishing Japan Ltd., 1986.
3. E.J. Meehan, S. Bruckenstein and I.M. Kolthoff and E.B. Sandell, Quantitative Chemical Analysis, 4th Edition, The Macmillan Company, 1969.
4. R.A. Day (Jr.) and A.L. Underwood, Quantitative Analysis, 6th Edition, Prentice Hall of India, 1993

Natural Products & Polymer Chemistry

CHE4E06 - Natural Products & Polymer Chemistry

UNIT 1: Basic aspects of Natural Products

Classification of Natural Products: Classification of Natural products based on chemical structure, physiological activity, taxonomy and Biogenesis. Carbohydrates. Terpenoids. Carotenoids. Alkaloids. Steroids. Anthocyanins etc. Methods of isolation of each class of compound. Essential Oils: Isolation and study of important constituents of lemon grass oil, citronella oil, cinnamon oil, palmarosa oil, turpentine



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oil, clove oil, sandalwood oil, Essential oils of turmeric and ginger. Oleoresins of pepper, chilly, ginger and turmeric. Aromatherapy.

UNIT 2: Terpenoids and Steroids

Terpenoids: classification, structure elucidation and synthesis of abietic acid. Steroids: Classification, structure of cholesterol, conversion of cholesterol to progesterone, androsterone and testosterone. Classification, structure and synthesis of prostaglandins, biosynthesis of fatty acids, prostaglandins, terpenoids and steroids. Structural elucidation of Cholesterol, Ergosterol, Oesterone, Androsterone, Testosterone, Progesterone, Cortisone and Corticosterone.

UNIT 3: Alkaloids and Anthocyanins

Alkaloids. Classification of alkaloids, structural elucidation based on degradative reactions (quinine and atropine). Biosynthesis of quinine and papaverine. Anthocyanins: Introduction, General Nature and Structure of Anthocyanidins. Flavone, Flavonol, Isoflavone and Chalcone

UNIT 4: Dyes, Pigments and Supramolecules

Brief introduction to dyes and pigments (natural and synthetic): β -carotene, indigo, cyclic tetrapyrroles (porphyrins, chlorins, chlorophyll, heme). Study of phthalocyanines, squarenes, and cyanine dyes. Introduction to Supramolecular chemistry and Molecular Recognition

References:

1. M. B. Smith, Organic Synthesis, 3/e, Academic Press, 2011.
2. F. A. Carey and R. J. Sundberg: Advanced Organic Chemistry (part B), 3rd ed., Plenum Press.
3. T.W. G. Solomons: Fundamentals of Organic Chemistry, 5th ed., John Wiley
4. H. O. House: Modern Synthetic Reactions, W. A. Benjamin
5. W. Carruthers: Some Modern Methods of Organic Synthesis, 4/e, Cambridge University



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Introducing Literature

ENG1B01 Introducing Literature (Core)

Module I

Language and its Literary Nuances Signifying Devices the Syntax: Verb Phrases, Adjuncts,

Collocations, Linkers, Sense Groups the Poetic: Comparisons, Exaggerations, Images, Symbols, Iamb, Trochee, Caesura, Enjambment

Texts:

1. Ruskin Bond “Eyes of the Cat”
2. Anton Chekhov “The Death of a Clerk”
3. Alfred Lord Tennyson “The Oak”
4. Langston Hughes “Dreams”
5. Emily Dickinson “Because I could not Stop for Death”

Module II

Polyphonic Texts Point of view (diegesis), polyphony and its rationale, single perspective and its dangers

Texts:

1. Freya Stark Winter in Arabia (excerpts)
2. Laura Bohannon “Shakespeare in the Bush”
3. Akira Kurosawa dir. Rashomon

Module III

Literature and Ideology The workings of power structures in literature; explication of the terms - ideology, hegemony, interpellation, discourse, grand narratives, little narratives – using literary texts; literary devices like irony and paradox and their role in reinforcing ideology.

Texts:

1. Arundhati Roy “The God of Small Things”



CRITERION	I	Curricular Aspects
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- Charlotte Bronte “Jane Eyre”
- George Orwell “A Hanging”
- Hansda Sowvendra Shekhars “The Adivasi will not Dance”

Module IV

Perspective of the Subaltern Dominant voices, marginalized voices, subaltern identities, resisting norm/authority

Texts:

- RK Narayan Swami and Friends (Excerpt from Chapter XI “In Father’s Presence”)
- Arun Kamble “Which language should I Speak?” and FM Shinde “Habit”
- The Letter Q: Ely Shipley <<https://www.poets.org/poetsorg/text/letter-q-ely-shipley>>
- Maxine Hong Kingston “No Name Woman”

Bond, Ruskin. “The Night the Roof Blew Off” Tigers Forever: Poems and Stories. RatnaSagar, Delhi, 1996.

Chekhov, Anton. Selected Stories of Anton Chekhov. Trans. Richard Pevear and Larissa Volokhonsky. RHUS, 2000.

Childs, Peter and Roger Fowler. The Routledge Dictionary of Literary Terms. Routledge, 2006.

Dasan, M, et al ed. Oxford India Anthology of Malayalam Dalit Writing. OUP India, 2012.

Eagleton, Terry. How to Read a Poem. Blackwell, 2007.

Fry, Stephen. The Ode Less Travelled: Unlocking the Poet Within. Arrow, 2007.

Garner, James Finn. Politically Correct Bedtime Stories. Wheeler, 1995.

Golding, William. Lord of the Flies. Penguin, 1954.

Hemingway, Ernest. “Hills like White Elephants” Men without Women. Amereon, 1940.

McCarthy, Michael and Felicity O'Dell. English Collocations in Use Advanced Book with Answers: How Words Work Together for Fluent and Natural English (Vocabulary in Use).

Cambridge UP, 2017. McCarthy, Michael and Felicity O'Dell. English Phrasal Verbs in Use Advanced. Cambridge UP, 2007. Noys, Benjamin. Introducing Theory: A Practical Guide. Continuum, 2007.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Orwell, George. 1984. General Press, 2017. Popkin, Cathy, ed. Anton Chekhov's Selected Stories (Norton Critical Edition). WW Norton & Co Inc, 2014.

Roy, Arundhati. The God of Small Things. Penguin, 2017. Seidman, Steven, Nancy Fischer and Chet Meeks. Introducing the New Sexuality Studies. Routledge, 2011.

Shakespeare, William. Hamlet. Barron's Educational Series, 1986.

Shamsie, Kamila. Home Fire. Bloomsbury, 2017.

Shekhar, Hansda Sowvendra. The Adivasi will not Dance: Stories. Speaking Tiger Publishing Private Limited, 2017.

Swan, Michael. Practical English Usage. Oxford, 2017.

Wilde, Oscar. "The Happy Prince" The Young King and Other Stories. Penguin, 2000.

Wilkie-Stibbs, Christine. The Outside Child: In and out of the Book. Routledge, 2008.

Woolf, Virginia. "Jane Eyre and Wuthering Heights". The Norton Anthology of Literature by Women: The Tradition in English, edited by Sandra M. Gilbert and Susan Gubar, W.W. Norton & Company, 1985, pp. 134-549.

Web Resources:

Adichie, Chimamanda Ngozi. "The Danger of a Single Story." TED: Ideas Worth Spreading, 7 Oct. 2009. www.youtube.com/watch?v=D9Ihs241zeg.

Ananthamurthy, UR. "Dalit Contribution to Indian Literature." YouTube, 9 Dec. 2010, www.youtube.com/watch?v=SajALSSbNKw.

"Collocations in English: Vocabulary Lesson." YouTube, 10 Nov. 2014.

www.youtube.com/watch?v=ssTWkruGar8. "100 Common Phrasal Verbs." YouTube, 19 July 2016, www.youtube.com/watch?v=TIUwXYEtL_o "English Grammar: Connectors and Linkers." YouTube, 14



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Appreciating Poetry

ENG2B02 – Appreciating Poetry

Module 1

Poetry- Some Key Concepts

Basic Elements of Poetry: Prosody: Rhythm, Meter – Rhyme - hard rhyme, soft rhyme, internal rhyme - Alliteration, Assonance – Diction.

Figures of Speech: Metaphor, Simile, Personification, Oxymoron, Metonymy, Synecdoche, Transferred Epithet.

Poetic Forms: Lyric, Ode, Sonnet, Haiku, Ballad, Couplet, Villanelle, Dramatic Monologue, Elegy, Satire, Mock Epic, Free Verse, Tanka, Jintishi, Ghazal, Rubai, Prose poetry, Narrative poetry, Performance Poetry.

Module 2

Poetic Forms

1. Sonnet: William Shakespeare: Shall I Compare thee to a Summer’s Day (Sonnet XVIII), John Milton: On His Blindness
2. Ballad: John Keats: La Belle Dame Sans Merci
3. Ode: P B Shelley: Ode to a Skylark
4. Elegy: W H Auden: In Memory of W. B. Yeats
5. Villanelle: Dylan Thomas: Do not go Gentle into that Good Night
6. (Dramatic) Monologue: Robert Browning: My Last Duchess
7. Metaphysical: John Donne: A Valediction Forbidding Mourning
8. Heroic Couplet: Alexander Pope: Extract from Essay on Man (Epistle I, Section II), “Presumptuous man! The reason wouldst thou find...”
9. Free Verse: Stanley Kunitz: The Layers
10. Song: Leonard Cohen: I’m your Man

Module 3:



CRITERION	I	Curricular Aspects
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World Poetry

1. Childhood: Rainer Maria Rilke: Childhood
2. Love and Loss: Pablo Neruda: Tonight, I Can Write the Saddest Lines
3. Protest: Nazim Hikmet: Some Advice to those who will Serve Time in Prison
4. Family: Langston Hughes: Mother to Son
5. Survival: Namdeo Dhasal: Stoneman, My Father & Me
6. Alienation: Diane Glancy: Without Title
7. War: Yehuda Amichai: Anniversaries of War
8. Commitment and Passion: Charles Baudelaire: Be Drunk
9. Environment: Joao Cabral de Melo Neto: Landscape of the Capibaribe River
10. Cultural Difference: Bassey Ikpi: Homeward

Module 4:

Appreciation of Poetry

Students can be briefed about how to analyze a poem. A few poems other than those given for the detailed study can be given to the students for practical analysis.

*NB: The learners are asked only short essay/s (paragraph/s) questions for appreciation (based on unseen poems) in the end semester examinations.

Reference

A Concise Companion to Literary Forms. Emerald, 2013.

Bernard Blackstone. Practical English Prosody: A Handbook for Students. Longman, 2009. C. T. Thomas Ed. Chaucer to Housman Vol I. New Delhi: B.I. Publications 1990.

Katherine Washburn and John S. Major Ed. World Poetry: An anthology of Verse from Antiquity to Our Time. New York: W. W. Norton, 1998.

Margaret Ferguson, Mary Jo Salter and Jon Stallworthy. The Noeton Anthology of Poetry. 5th Ed. New York: W. W. Norton, 2005.

Neil Corcoran. English Poetry since 1940. London: Longman, 1993.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Neil Roberts. A Companion to Twentieth Century Poetry. Malden, Blackwell,2003.

Philip Hobsbaum. Metre, Rhythm and Verse Form. London: Routledge, 2006.

Rajiv Patke, Postcolonial Poetry in English. Oxford: OUP, 2006.

R. P. Draper. An Introduction to Twentieth Century Poetry in English. Basingstoke, Palgrave,1999.

Tom Furniss and Michael Bath. Reading Poetry- An Introduction. London: Prentice Hall.

Appreciating Prose

ENG3B03 – Appreciating Prose

Module 1

Introduction to Prose

Etymology – Prose varieties –Fiction/Short Story/Tales -Autobiography/Biography -Newspaper/Journal Articles -Philosophical/Scientific Essays –Travelogues –Speech. Functions of prose. Evolution of Prose – Early translations- King Alfred- the Anglo-Saxon Chronicle- homilies- bible translations-secular prose- Morte D’arthur- Elizabethan prose-tracts, pamphlets and treatises- eighteenth century prose – Victorian and modern prose.

- Essay – formal/impersonal essay and informal/personal essay
- Types of formal essays: periodical essay, critical essay
- Personal essays /Life Writing: biography, autobiography, memoir and diaries.

Module 2

Reflections and speeches

1. Francis Bacon: Of Studies
2. Charles Lamb: Dream Children: A Reverie.
3. G. K Chesterton: On Running After One’s Hat
4. Albert Camus: Nobel Acceptance Speech
5. Arundhati Roy: Come September
6. Pico Iyer: In Praise of the Humble Comma (Biography/Autobiography/Memoir)



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7. Chinua Achebe: The Education of a British Protected Child (extract from the text.)

8. Marcel Junod : The First Atom Bomb. (extract from Warrior Without Weapons, translated by Edward Fitzgerald.)

9. Usha Jesudasan : Justice vs Mercy

Reference

A Concise Companion to Literary Forms. Emerald, 2013. (Chapter IV)

Dr. Takashi Nagai: Letter from Nagasaki & Dr. Tamiki Hara: Letter from Hiroshima Doris Lessing: On not winning the Nobel Prize (Nobel Lecture, December 7,2007)

Bertrand Russell: Ideas that have helped mankind.

Marilynne Robinson: When I Was a Child

Thomas de Quincey: The Literature of Knowledge and The Literature of Power

J.B Priestley: On Doing Nothing

Robert Lynd: On Forgetting

AG. Gardiner: On Living Again

English Grammar And Usage

ENG3B04 – ENGLISH GRAMMAR AND USAGE

Module 1

Basic Grammatical Units

1. Form class and Function words
2. Identifying the Grammatical labels and Functional labels of words
3. Verb in Function—Gerund, Infinitives, Participles—their uses
4. Synonyms, Antonyms, Precise Use
5. Mood and Modality
6. English Morphology – Compounding, Affixation, Inflexion, Derivation 7. Phrasal verbs and idioms

Module 2

The Sentence

1. Word order and Sentence Pattern
2. Coordination and Subordination



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Module 3

Sentence Transformations: A Relook at Traditional Categories

1. Tag questions
2. Active passive
3. Direct and indirect
4. Simple, complex, Compound
5. Movement – Collocation

Module 4

Important Grammatical Concepts

1. Time, Tenses and Aspects
2. Lexical Verbs and Auxiliary verbs: Their uses
3. Anomalous Finites
4. Subject—Verb agreement in sentences
5. Degrees of Comparison

Module 5

Practical Exercises

1. Reorder jumbled sentences
2. Correct the given sentences according to accepted Modern usage and justify the changes made
3. Paragraph Editing (with more focus on grammatical corrections)
4. Translate a passage from Mother Tongue to English

Reference

Gleason, H. A. Linguistics and English Grammar. Holt, Rinehart & Winston, Inc. 1965.

Leach, Geoffrey & Ian Savaitvik. A Communicative Grammar of English. ELBS.

Murphy,

Raymond. English Grammar. Cambridge University Press, 2005

Quirk R. & Sidney Greenbaum. A University Grammar of English. ELBS.

Swan, Michael. Practical English Usage. Oxford University Press, 2005.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Thomson, A. J. and Martinet. A Practical English Grammar Combined Exercises Vol. 1 & 2. Oxford University Press.

Quirk, Randolph. The Use of English. Longman, 1968.

Sailaja, Pingali. Indian English. Edinburgh University Press, 2009.

Appreciating Fiction

ENG4B05 – Appreciating Fiction

Module 1

Understanding Fiction

What is fiction - Plot- Character- Atmosphere- Narrative Techniques- Points of view-Difference between long and short fiction- Different types of fiction

Module 2

Short Fiction

1. O Henry- The Cactus
2. Maxim Gorky- Her Lover
3. James Joyce- Eveline
4. Ray Bradbury- Sound of Thunder
5. Sally Morgan- The Letter
6. Arun Joshi- The Homecoming
7. Ken Liu- The Paper Menagerie

Module 3

Long Fiction

George Orwell- **Animal Farm**

Module 4

Film

Moby Dick: dir. John Huston

Reference

Craft, Stephen and Helen D Cross. Literature, Criticism and Style: A Practical Guide to Advanced Level English Language. Oxford: OUP,2000.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Watt, Ian. The Rise of the Novel. University of California Press, 2001. Booth, Wayne C. Rhetoric and Fiction. University of Chicago Press, 1983 Lubbock, Percy. Craft of Fiction. Penguin 2017.

Lazar, Gillian. Literature and Language Teaching: A Guide for Teachers and Learners. Cambridge University Press, 2008.

Guerin, Wilfred L et al. A Handbook of Critical Approaches to Literature. New Delhi: OUP, 2007.

Borges, Jorge Luis and Andrew Hurley. Collected Fictions. The Penguin Press, 1954.

Camus, Albert. The Stranger. New York: Vintage Books, 1954

Evans, Arthur B eds. The Wesleyan Anthology of Science Fiction. Middletown, Conn: Wesleyan University Press, 2010

Gorky, Maxim. The Collected Short Stories of Maxim Gorky. Citadel Press, 1988 Joyce, James - Dubliners at Planet eBook

Liu, Ken. The Paper Menagerie and Other Stories. London, Sydney, New York: Saga Press, 2016

Maupassant, Guy De. Complete Maupassant Original Short Stories at Project Gutenberg www.gutenberg.org

Morgan, Sally. My Place. New York: Seaver Books, 1987.

O' Henry. Works by O Henry- at Project Gutenberg www.gutenberg.org Orwell, George –1984. London: Secker and Warburg, 1949

Poe, Edgar Allan –The Complete Tales and Poems of Edgar Allan Poe. New York: Vintage Books, 1975

Salinger, J D. The Catcher in the Rye. Boston: Little, Brown, 1951

Tagore, Rabindranath. The Hungry Stones and Other Stories. at Project Gutenberg. www.gutenberg.org

Tolstoy, Leo. The Death of Ivan Ilyich and Other Stories. New York: New American Library, 1960

Literary Criticism

ENG4B06 – Literary Criticism

Module 1

Classical Literary Criticism

- Plato: Concept of Art - Mimesis, His attack on poetry, Moral Concerns of literature, Views on Drama.
- Aristotle: Poetics - Mimesis, Catharsis, Hamartia - Defence of Poetry -
- Definition of Tragedy-Parts of Tragedy, Plot, Tragic Hero, Three Unities, Comedy, Epic, Poetic style.
- Horace: Ars Poetica - Definition of art, Views on Poetry and Drama.
- Longinus: Romanticism, Sublimity in literature – Its sources.

Module 2

English Literary Criticism – The Sixteenth to the Nineteenth Century

- Philip Sidney: Apology for Poetry – Reply to Stephen Gosson, The Argumentative Method



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- John Dryden: Neoclassicism – The function of Poetry, Dramatic Poesy, Observations on tragedy, comedy, satire, epic.
- Dr. Samuel Johnson: Neoclassicism, Biographical Criticism, Historical approach, Observations on Poetry, Drama, Shakespeare, Tragicomedy, Three unities.
- English Literary Criticism – The Nineteenth Century
- William Wordsworth: “Preface to Lyrical Ballads” – The Romantic Creed - Difference between Neoclassicism and Romanticism - definition of poetry – poetic diction and language.
- S. T. Coleridge: Theory of Imagination, Fancy and Imagination, Primary Imagination and Secondary imagination, Poetic Genius.
- P. B. Shelley: The Defence of Poetry – Concept of Poetry.
- Mathew Arnold: Classicism - Concept of Culture – the use and function of poetry - Touchstone method – Moralistic criticism – Function of criticism – High seriousness and Grand Style.

Module 3:

Literary Criticism – The Twentieth Century

- T.S. Eliot: “Tradition and Individual Talent” – Historical Sense – Impersonality – Poetic Emotion – Objective Correlative – Dissociation of Sensibility.
- I. A. Richards: Poetry and Communication, Practical Criticism - The Four Kinds of Meaning – Scientific and Emotive uses of Language.
- F.R. Leavis: Concept of Literature and Criticism
- Formalism: Key Features of Formalism - Its Origin, Focus on language, Form, Literariness, Defamiliarization, Fabula/Syuzet, Motivation.
- New Criticism: The origin - Close reading and explication - Ambiguity, Paradox, Irony, Tension, Intentional Fallacy and Affective fallacy.
- Archetypal Criticism: Myth, Archetype, Collective Unconscious, Northrop Frye.

Module 4

Glossary

- Indian Aesthetics: Rasa, Dhvani, Vyanjana, Alamkara, Thinai.
- Literary Movements: Classicism, Neoclassicism, Romanticism, Humanism, Realism, Naturalism, symbolism.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Literary Concepts: Catharsis, Mimesis, Objective Correlative, Ambiguity, Negative Capability.

Reference

1. B Prasad, An Introduction to English Criticism.
2. Lois Tyson, Critical Theory Today.
3. David Daiches, Critical Approaches to Literature.
4. Harry Blamires. A History of Literary Criticism.
5. Ramaswamy S & Sethuraman V.S. The English Critical Tradition.
6. Das B. B., Literary Criticism: A Reading

Appreciating Drama And Theatre

ENG5B07 – Appreciating Drama And Theatre

Module 1

Drama - Some Key Concepts

Basic Elements of Drama: Tragedy, Comedy, Tragicomedy; The Constituent Parts of Drama – Plot, Character, Thought, Song, Spectacle, Diction, Three Unities, Tragic Hero, Chorus, Simple plot and Complex plot; The basic structure of tragedy

History of Drama: Greek Theatre and Drama, Miracle Plays and Morality Plays, University Wits, Shakespearean Theatre, Restoration Drama, Sentimental Drama, Anti-sentimental Drama, Comedy of Manners, Drama of the Romantic Period, Decadence, Problem Play, Realism, Ibsen and Bernard Shaw. Avant- garde: **Expressionism & Epic Theatre**, Angry Young Man, The Theatre of the Absurd, Comedy of Menace, The Theatre of Cruelty, Feminist theatre, Street theatre, Ritualistic Theatre, The Poor theatre, Radio Drama.

Module 2

Classical Drama

William Shakespeare: Othello

Module 3

World Plays

1. Anton Chekov: **The Bear/ The Boor**
2. Edward Albee: **Zoo Story**



CRITERION	I	Curricular Aspects
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3. Kobo Abe: The Man who turned into a Stick – trans. Donald Keene

Module 4

Drama Adaptation

1. Roman Polanski: Macbeth (1971)

2. Syamaprasad: Akale (2004)

* NB: The learners are asked only essay/s and short essay/s (paragraph/s) questions from the adaptations in the end semester examinations.

Reference

Catherine Belsey. The Subject of Tragedy- Identity and Difference in Renaissance Drama. London: Methuen, 1985.

Jean Chothia. English Drama of the Early Modern Period, 1890-1940. London: Longman, 1996.

A C Bradley, Shakespearean Tragedy. London: Elibron, 1904.

H.Granville-Barker, Study of Drama. London: Sedgwick, 1931.

Peter Womack and Simon Shepherd. English Drama: A Cultural History. Cambridge: Blackwell, 1996.

Literary Theory

ENG5B08 –Literary Theory

Module 1

Liberal Humanism versus Theory

- Liberal Humanism: Dominant aspects of Liberal humanism with examples
- Literary Theory: Dominant aspects of literary theory with examples. Linguistic Turn – Critical turn – Paradigm shift

Module 2

Structuralism, Poststructuralism and Psychoanalysis

- Structuralism: Saussure - Sign, Signifier, Signified – Claude Levi-Strauss and Roland Barthes – Structuralist narratology
- Poststructuralism: Derrida, Logocentrism, Aporia, Decentering
- Psychoanalytic Theory: Unconscious. Freud – Id, Ego, Superego, Oedipus Complex. Lacan – Imaginary, Symbolic, Real, Mirror Stage



CRITERION	I	Curricular Aspects
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Module 3

Marxism, Cultural Studies, Cultural Materialism and New Historicism

- **Marxism:** Base, Superstructure, Materialism, ideology. The Frankfurt School – Culture industry. Antonio Gramsci – The formation of the intellectuals, Subaltern. Louis Althusser – Ideological State apparatus and Interpellation.
- **Cultural Studies:** Culturalism, New Left, CCCS, Raymond Williams’ definition of Culture, Structure of feeling, Stuart Hall and the ‘popular’, and the two paradigms of Cultural Studies.
- **Cultural Materialism & New Historicism:** Marxist framework of Culture and History, Historiography, Foucauldian notion of Power, Difference with Old Historicism, Stephen Greenblatt, Louis Montrose

Module 4

Feminism and Queer Theory

- **Feminism:** The three waves in feminism, Gynocriticism, French Feminism - Ecriture feminine, Sexual Politics, Marxist Feminism, Lesbian Feminism, Backlash, Black Feminism, Dalit Feminism, Post-feminism, Womanism.
- **Queer Theory:** Social constructionism of gender and sexuality, LGBTIQ, Transgender identity

Module 5

Postmodernism, Postcolonialism, and Ecocriticism

- **Postcolonialism:** Eurocentrism, Orientalism, Alterity, Diaspora, Hybridity, Uncanny, Strategic Essentialism,

Subaltern Studies, Postcolonial Critique of Nationalism.

- **Postmodernism:** Critique of Enlightenment and Universalism, Habermas’s notion of Modernity as an Incomplete Project, Lyotard’s concept of incredulity towards metanarratives, Baudrillard’s ideas of Simulation, Simulacra and hyperreality, Brian McHale’s concept of Postmodernist literatures.
- **Ecocriticism:** Anthropocentrism, Shallow Ecology vs Deep Ecology, Environmental Imagination, Ecofeminism

Reference

Hans Bertons. Literary Theory.

Terry Eagleton. Literary Theory: An Introduction. Aijaz Ahmad. In Theory: Classes, Nations, Literatures.

Jonathan Culler. Literary Theory: A Very Short Introduction.

Terry Eagleton. After Theory. Peter Barry. Beginning Theory.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Indian Writing in English

ENG5B10 –Indian Writing In English

Module 1: Poetry

- Rabindranath Tagore: Two verses - one each from The Gitanjali and The Gardener.
- Sarojini Naidu: The Coromandel Fishers.
- Kamala Das: Introduction.
- Arun Kolatkar: Old Woman.
- Agha Shahid Ali: Country without a Postcard.

Module 2: Prose

- B R Ambedkar: Speech at Mahad.
- Salman Rushdie: Imaginary Homelands.

Module 3: Fiction

- R K Narayan: The Fortune Teller
- Tamsula Ao: Laburnum for my Head.
- Jhumpa Lahiri: The Interpreter of Maladies

Module 4: Drama and Film

- Girish Karnad: Fire and Rain.
- Charulatha: dir. Satyajit Ray.

Reference

Iyengar, Sreenivasa. Indian Writing in English. Delhi: Sterling, 1984.

Naik, M.K. A History of Indian English Literature. Delhi: Sahitya Academy, 1982.

Mehrotra, A.K. A Concise History of Indian Literature in English. Delhi: Permanent Black, 2008 Naik, M.K.

Perspectives on Indian Poetry in English. Delhi: Abhinav Publication, 1984

Bhairava and V. Sarang ed. Indian English Fiction 1980-1990

An Assessment. Delhi: Permanent Black, 1994.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Naik, M.K. and S.M. Panekar ed. Perspectives on Indian Drama in English. Delhi: Permanent Black, 1977.

Nelson, F.S., Reworking: The Literature of Indian Diaspora. New York: Permanent Black, 1992.

Williams, H.M. Indo Anglian Literature, 1800-1970. Bombay: Orient Longman, 1976.

Amga, H.I., Indo-English Poetry. Jaipur: Surabhi Publication, 2000.

Roy, Anuradha. Patterns of Feminist Consciousness in Indian Women Writers: Some Feminist Issues. Delhi: Prestige Books, 1999

Voices Of Women

ENG6B11 –VOICES OF WOMEN

Module 1: Essays

Chimamanda Ngozi Adichie: We Should All Be Feminists
Virginia Woolf: Shakespeare's Sister

Module 2: Poetry

- Eunice D Souza: Bequest
- Amy Lowell: Vintage
- Sappho: To Anactoria in Lydia
- Inez Hernandez Avila: To Other Women Who Were Ugly Once
- Judith Wright: Eve to her Daughters

Module 3: Fiction

- Novel: Kate Chopin: The Awakening Short stories
 - Clarice Lispector : Preciousness
- Alice Walker: The Flowers

Module 4: Drama and Film

- Thozhilkendrathilekku
 - At Five in the Afternoon: dir. Samira Makhmalbuf
- Mustang: dir Denize Gamze Erguven



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Reference

Kamala Bhasin---What is Patriarchy? Nivedita Menon--Seeing like A Feminist Naomi Wolf--Beauty Myth

Alice Walker ---Color Purple Caryl Churchill---Vinegar Tom

Deepa Mehta's films---Earth, Fire, Water Rina Das' Film---The village Rockster

Classics Of World Literature

ENG6B12 –Classics of World Literatrure

Module 1: Introduction to the ancient world

Introducing epics of the world and conventions: The Iliad, Odyssey, Aeneid, The Epic of Gilgamesh, The Mahabharata and Ramayana – Introduction to Greek theatre and Indian theatre

Module 2: Poetry

- Dante: Divine Comedy Canto IV
- Goethe: The Violet
- Alexander Pushkin: A Flower Shrivelled Bare of Fragrance
- Rilke: Adam
- Omar Khayyam: The Rubaiyat: 68-72
- Rumi: Let Go of Your Worries, Look at Love, I died from Minerality
- Matsuo Basho: In the Twilight Rain

Module 3: Drama and Film

- Sophocles: Oedipus Rex
- Bhasa: Urubhangam
- Les Miserables: dir. Bille August

Module 4: Fiction

- Maupassant: Mother Savage
- Tolstoy: The Three Questions
- Firdausi: Shahnamah: The Story of Sohrab and Rustum
- Ryunosuke Akutagawa: In a Grove
- PU Songling: The Painted Wall

Reference



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Boccaccio, Giovanni. The Decameron.

Virgil. Aeneid. Trans. Edward McCrorie. USA: University of Michigan Press, 1996.

Maupassant, Guy De. Complete Maupassant Original Short Stories at Project Gutenberg www.gutenberg.org

Open Anthology of Early World Literature in English Translation hosted at the Columbia State University website

Songling, PU. Strange Stories from a Chinese Studio trans. Herbert A Giles. London: Thos. De La Rue & co, 1880. www.rumi.org.uk and www.khamush.com

Pushkin, Alexander. The Complete Works of Alexander Pushkin from Eugene Onegin to The Queen of Spades

Film Studies

ENG6B13 – FILM STUDIES

Module 1: Introduction to the basic terminology of filmmaking:

Mise-en-scene, long takes, shallow focus, deep focus, Shots: (close up, medium shot, long shot). Camera Angle: Straight on Angle Shots, High Angle Shots, Low Angle shots. Shot-Reverse Shot.

Editing: chronological editing, Continuity Editing, Cross cutting, Montage, continuity cuts, jump cuts, match cuts, Compilation cuts, 30degree rule, 180degree rule.

Sound: Diegetic and Extra-diegetic sound, Speech and Music. Colour: Black and White Cinema, Technicolor, Eastman Color.

Introduction to film genres:

The Major genres: Narrative, Avant-garde, Documentary, Feature Films, Short Films.

Other genres: Thriller, Melodrama, Musical, Horror, Western, Fantasy, Animation, Film noir, Expressionist, Historical, Mythological, Science fiction, Road movies, Digital films, Tele-films, 3-D films.

Introduction to major movements and theories

The silent era, Classic Hollywood cinema, Italian Neo-Realism, French New wave, Asian Cinemas, Third Cinema and Indian cinema.

Introduction to the basic concepts of film theories: Realism, Formalism, Auteur theory, Apparatus Theory, Suture Theory, Culture Industry, Male Gaze, Film Semiotics.



CRITERION	I	Curricular Aspects
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Module 2: Selected Essays on Film

Andre Bazin: The Evolution of the Language of Cinema (from What is Cinema)

Gilbert Harmen: Semiotics and the Cinema: Metz and Wollen

Laura Mulvey: Visual pleasure and Narrative Cinema

Bill Nichols: The Voice of the Documentary

Module 3: Case Studies of Early Classics

Charlie Chaplin: The Gold Rush

Francois Truffaut: 400 Blows

Federico Fellini: 8 1/2

Andrei Tarkovsky: The Mirror

Module 4: Case Studies of Contemporary Classics

Milos Forman: One Flew over the Cuckoo's Nest

Adoor Gopalakrishnan: Elipathayam (The Rat Trap)

Ousmane Sembene: Guelwaar

Kim Ki-duk: Spring, Summer, Winter, Autumn and Spring

Reference

1. Virginia Wright Wexman A History of Film Delhi, Pearson
 2. Susan Heyward Key concepts in Cinema Studies London Routledge
 3. Amy Villarejo. Film Studies : The Basics London & New York Routledge. 2007 I Warren Buckland Teach
- Yourselves Film studies, London, Hadden



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- J Dudley Andrew The major Film Theories: An Introduction New Delhi Oxford Leo Braudy & Marshall Cohen Eds. Film Theory and Criticism Oxford OUP
- J Dudley Andrew Concepts in Film theory
- Bill Nicols ed. Movies and Methods
- Andre Bazin What is Cinema Berkeley U of California P
- John Hill & Pamela Church Gilson (eds) The Oxford Guide to Film Studies OUP

New Literatures In English

ENG6B14 – New Literatures In English

Module 1: Introduction

A brief introduction to the canon of English literature, Commonwealth literature, post Colonialism and the context of New Literatures

Module 2: Poetry

Alice Walker: Remember Me? (U.S)

A D Hope: Australia (Australia)

Derek Walcott: A Far Cry from Africa (Caribbean)

Faiz Ahmed Faiz: When Autumn Came (Pakistan)

Li Young Lee: I Ask my Mother to Sing (China)

Tenzin Tsundue : When it Rains in Dharamsala (Tibet)

David Diop: The White Man Killed my Father (West Africa)

Margaret Atwood: Helen of Troy Does Countertop Dancing (Canada)

Yasmine Gooneratne: There was a Country (Sri Lanka)

Module 3: Prose and Short Fiction

Gabriel Garcia Marquez: The Handsomest Drowned Man in the World

Alice Munroe: Voices

Robyn Davidson: Tracks: One Woman’s Journey across 1700 miles of Australian Outbreak

Module 4: Drama

Wole Soyinka: Death and the King’s Horseman

Eugene O’Neil: Long Day’s Journey into Night



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Module 5: Film

Kite Runner: dir Marc Forster

Embrace of the Serpent: dir Ciro Guerra

Reference

Gray, Richard. A Brief History of American Literature. London: Wiley-Blackwell,2011.

Pierce, Peter. The Cambridge History of Australian Literature: Queensland: James Cook University,2017.

Young, Robert C. Post Colonialism: A Very Short Introduction. London: Oxford,2003.

Atwood, Margaret. Survival: A Thematic Guide to Canadian Literature. Toronto: Anansi, 2004.

Writing For The Media

ENG6B17 – Writing For The Media

Module 1: Technical Writing

Definition- types of technical writing- structure of user manuals, technical descriptions, instructions and accessories –dissertation and thesis writing

Module 2: Writing for audio visual media

Radio - types of programmes- writing for broadcast-scripting for drama feature, talks and discussions- news writing for radio-fixed programme chart preparation-scope of radio in podcasting-community and commercial FM broadcasting.

Television and film documentary-concept to story structure-narrative arc –script-screenplay and storyboard – production book and set design-difference between various media content- TV programmes- documentary and fiction.

Module 3: Advertisement

Various types of commercials- copywriting for print- radio and online advertisement- creative content filling- TV commercials.



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Module 4: Writing for digital media

Digital reporting-writing for websites-blogging and vlogging script- news gathering and online stylistics- laws and ethics of new media - cyber laws

Reference

CORE TEXT: A text containing the above lessons will be made available

FURTHER READING:

Stoval, James Glen. Writing for the Mass Media. Pearson Education, 2006.

Menchar, Melvin. Basic News Writing. William C Brown Cox, 1983

Rich, Carole. Writing and Reporting News: A Coaching Method. Wadsworth/Thomson Learning, 2003.

Neal, James A and Suzane S Brown. News Writing and Reporting. Surjeeth Publications, 2003.

Feldman, Tony. An Introduction to Digital Media. Blueprint Series, 1996. Boother, Dianna. F Writing. Macmillan, 2008.

Lewis, Richard. Digital Media: An Introduction. Prentice Hall. Nigel, Chapman. Digital Media Tools. Paperback 26 Oct, 2007.

Appreciating Literature

ENG5D03 – Appreciating Literature

Module 1: Poetry

- The Waking: Theodore Roethke.
- The Enchanted Shirt: John Hay.
- Peacock and Nightingale: Robert Finch.
- Ozymandias: PB Shelley.
- Night of the Scorpion: Nissim Ezekiel.

Module 2: Prose

- On Doors: Christopher Darlington Morley.
- On running After One's Hat: G.K. Chesterton.

Module 3: Short Stories.

- The Gift of the Magi: O. Henry.



CRITERION	I	Curricular Aspects
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- Mark of Vishnu: Khushwant Singh.
- Happy Prince: Oscar Wilde.

Module 4: Drama

- The Monkey’s Paw. W.W. Jacobs.

Reference

1. Thomas, C.T. Twentieth Century Verse. Macmillan India Limited: 1979.
2. Wilde, Oskar. The Happy Prince and Other short stories. www.ibiblio.org/gutenberg

Introduction To Communication Journalism

JOU1(2)C01 – Introduction To Communication Journalism

Module I: Fundamentals of communication

Definitions of communication, elements of communication, types of communication, functions and dysfunctions of mass communication; Models of Communication - Aristotle, Shannon and Weaver, Lasswell, Schramm and Berlo; Normative theories; Magic Bullet theory.

Module II: Different Media

Print media –advantages and limitations of print media, Challenges faced by Print Media. Electronic media and film: characteristics of radio and television – strengths and limitations of radio and television, F.M radio, Community radio, radio on mobile; 24X7 News Channels in India. – Communication aspect of film.

New media: Definitions- characteristics of new media – evolution of internet – online media platform: blog – online newspapers – citizen journalism – social media- troll. Impact of New media on other media

Module III: Freedom of the press

Freedom of speech and expression in Indian Constitution – Article 19(1) (a) and reasonable restrictions – defamation; Right to Information Act, Media ethics; contempt of court, Film Censorship and CBFC, Plagiarism, sting operations.

Module IV: Evolution of Indian press

Evolution of Print Media world-wide; Evolution of Indian Press: James Augustus Hicky – James Silk Buckingham – Serampore missionaries – Raja Ram Mohan Roy – freedom movement and the press – Gandhi as a journalist – press in the post-independence period Press Commissions, Press Council of



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India, Press during the Internal Emergency, Contemporary Press in India: Paid News, Corporatisation of media.

Module V: History of Malayalam press

Rajya samacharam – Paschimodayam – Jnana Nikshepam Western Star and Paschima Tharaka; Deepika– Kerala Mithram – Kerala Patrika – Malayala Manorama – Mathrubhumi – Kerala Kaumudi – Al-Ameen – Deenabhandu; Early Literary publications in Malayalam; Early Women’s publications in Malayalam; Publications by political and religious organizations, Malayalam press during the Freedom Struggle.

Module VI: Legends of journalism

Prominent personalities of Indian journalism- S.Sadanand, Ram Nath Goenka, Pothan Joseph, Kuldeep Nayar, Leela Menon, Legends of Malayalam Journalism: Hermann Gundert – Kandathil Varughese Mappillai – Swadeshabhimani Ramakrishna Pillai – Kesari Balakrishna Pillai – K.P. Kesava Menon – V.K. Madhavan Kutty, C.V. Kunhiraman, K. Jayachandran, T N Gopakumar.

Reference

1. James Watson and Anne Hill : A Dictionary of Communication and Media Studies, Edward Arnold Group, London.
2. Joseph R. Dominick : The Dynamics of Mass Communication, McGraw Hill, New Delhi.
3. Denis McQuail and Sven Windahl: Communication Models.
4. Keval J Kumar : Mass Communication in India, Jaico Publishing House, New Delhi, 2005.
5. Dr. J V Vilanilam : Mass Communication in India.
6. GNS Raghavan, ‘The Press in India’.
7. Robin Jeffrey, ‘India’s Newspaper Revolution’.
8. Puthupally Raghavan, ‘Kerala Pathrapravarthana Charithram’.
9. M.V.Thomas, ‘Bharathiya Pathracharithram’, Bhasha Institute.
10. Joseph A Devito : Communicology: An Introduction to the study of Communication, Harper and Row, New York, 1985.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Introduction To Electronic Media

JOU1(2)C02 – Introduction to Electronic Media

Module I: Communication

Definition, elements and types of communication, mass communication - nature, characteristics, functions and dysfunctions of mass communication, mass media -types of media: print, radio, TV, film and new media. News: types of news - news determinants – news story structure- print VS broadcast news.

Module II: Radio

Characteristics, scope and limitations - brief history of radio and AIR; Organisational set up of AIR; Types of radio stations: AM, FM, Community radio, Private F M Stations in Malayalam; Online Radio, Radio on Mobile.

Module III: Basic elements of radio programme.

Basic elements of radio programme- sound, music and effects. Writing for the ear - radio news writing, news reading- script writing for different radio programmes – interview, talk, feature, commentary, magazine programmes, radio drama, documentary; Radio Jockeying; Outside Broadcasting- Cultural event and Sports event.

Module IV: Internet

Internet as a medium of communication: history and evolution of internet – characteristics of new media: immediacy, interactivity, universality, hypertext, multimedia, media convergence; Cyber laws and IT Act.

Module V: Online reporting

Online reporting: language and style of online journalism, tools for newsgathering, news determinants in cyberspace, dos and don'ts of online reporting; Online News writing: Types of Online news – writing breaking news, writing features, editing – HL writing

Module VI: Social Media

Social media: evolution, definition and types, social media as a tool for news gathering, social media activism: Jasmine Revolution, India Against Corruption movement, Social media as a tool for Political Communication, social media as a tool for Public Relations, Political Communication and Propaganda.

Reference

1. Joseph A Devito : Communicology: An Introduction to the study of
2. Communication, Harper and Row, New York, 3. 1985.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Joseph R. Dominick : The Dynamics of Mass Communication, McGraw Hill, New Delhi.
4. Agee, Ault & Emery : Introduction to Mass Communications, Harper and Row, New York, 1985.
5. Spencer Crump : Fundamentals of Journalism, McGraw Hill Book Company.
6. Oxford : International Encyclopedia of Communications.
7. James Watson and Anne Hill : A Dictionary of Communication and Media
8. Studies, Edward Arnold Group, London.
9. John Vivian : The Media of Mass Communication, Allyn and Bacon.
10. Andrew Boyd : Broadcast Journalism, Techniques of Radio and
11. Television News, Focal Press, London.
12. Tapas Ray, 'Online Journalism – A Basic Text', Foundation Delhi, 2006.
13. Jason Whittaker, The New Media Handbook –The Cyberspace Handbook .
14. Sunil Saxena , 'Broadcasting News: The craft and technology of online Journalism'.
15. Jason Whittaker, 'Web Production for writers and journalists'.
16. Anna Evertt, John T. Caldwell, 'New Media:Theories and practice of Digitexuality'.
17. Stephen Quinn, 'Digital Sub editing and Design'.
18. Nalini Rajan (ed.), '21st Century Journalism in India', Sage, 2007.
19. Aravind Singhal & Everett M. Rogers, 'India's Communication Revolution'.

Introduction To T.V & Cinema

JOU4(3)C02 – Introduction To T.V & Cinema

Module I



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Television: characteristics, scope and limitations - origin and development of television, DD Cable TV, Satellite TV, DTH; News Channels with special reference to Malayalam; Organisational structure of News wing of a TV channel. TV on Web, TV on Mobile.

Module II: News and Programmes

Structure and types of TV news – TV news gathering - news writing – voice over, news production, anchoring, PCR, teleprompter Scripting for television programmes - TV interviewing, Discussion, TV magazines, Live programmes, special audience programmes, sting operation

Module III

Cinema ; Characteristics and types Cinema: a brief history. -Lumiere brothers and early experiments Major film movements – An Overview German expressionism- Cabinet of Dr.Caligary by Robert Wiene. Soviet montage - Battleship Potemkin by Sergie Eisentein. Italian Neo Realism - Bicycle thieves by Vittorio Desseca. A few Great masters: Charles Spencer Chaplin - Akira Kurosawa, Kim Ki Duk and Mohsen Makmalbaf.

Module IV.: Indian Cinema

Indian Cinema: Early experiments, New wave and commercial cinema, FTII – Indian Masters: H.S. Bhatwadekar, DG. Phalke, Satyajith Ray - Ritwik Ghatak, Mrinal Sen, Girish Kasaravalli, K Balachandar

Module V

Malayalam Cinema – a decade-wise Overview, Masters: - Adoor Gopalakrishnan - G Aravindan - John Abraham, P.N. Menon, K.G. George; contemporary Malayalam cinema.

Module VI: Film Making

Steps in film making: Pre-Production, Production and post production. Visual language-Basics of cinematography: types of shots, camera movements, camera angles, Lighting- three point lighting techniques.

Additional List of Cinema:

1. The Circus - Charlie Chaplin
2. Psycho - Alfred Hitchcock
3. Dreams - Akira Kurosawa
4. Three Iron - Kim Ki Duk
5. Gabba - Mohsen Makmalbaf.
6. Apur Sansar - Satyajith Ray
7. Subarnarekha - Ritwik Ghatak



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8. Vidheyam - Adoor Gopala Krishnan
9. Vaasthuhaara- G Aravindan
10. Cheriyaachante Kroorakrithyangal - John Abraham
11. Olavum Theeravum – P.N.Menon
12. Panchavadippalam - K.G. George
13. Ee. Ma. Yow (R.I.P.) – Lijo Jose Pellissrey.

Reference

1. Herbert Zettl. Television Production Handbook, 7th Edition.
2. Arthur Asa Berger. Scripts, Writing for Radio and Television. SAGE Publications
3. Virginia Wright Wexman. A history of Film. 6th edition.
4. Jarek KUPSC. The History of Cinema for beginners.
5. Keval J. Kumar, Mass Communication in India', Jaico Publishing House, New Delhi.
6. Vijaykrishnan, 'Malayala Cinimayude katha'. Mathrubhumi Books.
7. M.F. Thomas. Indian Cinema. D C Books
8. Vijaykrishnan, Indian Cinemayude 100 Varshangal, Indian Cinemayude Katha. Chintha Publishers.
9. Vijaykrishnan. Loka Cinema. DC Books
10. Jill Nilmes: An Introduction to Film Studies, Routledge, London, 1996
11. Bruce Mamer: Film Production Technique, Thomson Wadsworth, USA.

Web Resources

1. www.imdb.com
2. www.mrqe.com
3. www.wikipedia.org



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Journalistic Practices

JOU4(3)C01 – Journalistic Practices

Module I: Print Media Journalism: Organisational structure of a newspaper

Business, Mechanical and editorial departmental chart- responsibilities and qualities of chief editor – news editor, chief sub editors, sub editors, Bureau: bureau chief- chief reporter – reporters, stringers and freelancers; photo journalists.

Module II: Print Media Journalism: Contents and Reporting practices

News – definitions – types of news – news determinants(values) – News story structure – lead (intro) and body– inverted pyramid and hour glass, principles of news writing; features – articles– middles – interviews – reviews – profiles – columns – travelogues – cartoons. Reporting practices – basics of reporting – on the spot, beats assignments – types of reporting – straight, interpretative, investigative, crime. Sources for reporting; Principles of reporting – news sources news agencies

Module III: Print Media Journalism: Editing

Editing for newspapers – line editing, creative editing and design editing; general rules of editing headlines – writing Headline; writing editorials; condensing stories, News agencies and handling news agency copies; Design and page make-up; systems of page make-up.

Module IV: Public Relations

Introduction to PR: definitions, origin and evolution of public relations – external and internal publics- role and functions of PR – PR tools – qualities of a PRO – PRSI, IPRA, PR campaign, PR campaign conducted by Central and State governments; **Political P R, Ethics in Public relations; PRSI code of conduct; Corporate Communication and CSR.**

Module V: Advertising

Definition – evolution of advertising – functions and effects of advertising – types of ads advertorial- ad agencies and functions of advertising agencies – ASCI and DAVP – Ad. Campaign.

Module VI: Copy writing practices

Ad copy – elements of copy: Principles of illustration, HL, display and caption, text, logo and baseline – copywriting for broadcast commercials – jingles and internet ads. Ethics of advertising: ethical issues of advertising – professional organizations and code of ethics.

Reference

1. Shrivastava, K.M., ‘News reporting and editing’, Sterling publishers Pvt. Ltd, New Delhi, 2003.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2. Kamath M.V., 'Professional Journalism', Vikas publishing House, New Delhi.1980.
3. Bruce Westly, News Editing.
4. M.L. Stein. and Susan F Paterno, 'The News Writer's Hand book', Surjeet Publications, New Delhi, 2003.
5. George A Hough, 'News Writing', Kanishka Publishers, New Delhi, 2006.
6. Joseph M.K., 'Outline of Reporting', Anmol Publications, News Delhi, 2002.
7. Franklin, et al., 'Key Concepts in Journalism Studies', Vistaar Publications, New Delhi, 2005. 8.
8. Jan R. Hakemulder, 'News Reporting and Editing', Anmol Publications, New Delhi, 1998.
8. Sandeep Sharma & Deepak Kumar, 'Advertising, Planning, implementations and control', Mangal Deep Publications, Jaipur.
9. Sanjay Kaptan & Akhilesh Acharya, 'Advertisement in Print Media', Book Enclave, Jaipur.
10. S.A Chunawalla, 'Advertisement an Introductory Text', Himalaya Publishing,
11. Chunnawalla etal, 'Advertising Theory and Practice', Himalaya Publishing, New Delhi.
12. Otto Klepner, 'Advertising Procedures', Atlanta Books. 6. Scott M Cutlip and Allan H. Centre, 'Effective Public Relations', Pearson Education Ltd. Delhi.
13. Sam Black, 'Practical Public Relations', UBS Publishers Distributors Pvt Ltd.
14. D.S. Mehta, 'Handbook of PR in India'.

British Literature From Chaucer To 18th Century

ENG1C01 – British Literature From Chaucer To 18th Century

Section A: Poetry

Geoffrey Chaucer : "The General Prologue to Canterbury Tales" (first 100 lines)

William Shakespeare : Sonnet 18. "Shall I Compare thee to a Summer's Day"

John Donne : "The Canonization"



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

John Milton : “Paradise Lost” Book 1 (lines up to 270)
 John Dryden : “Mac Flecknoe”
 Andrew Marvell : “To His Coy Mistress”
 Thomas Gray : “Elegy written in a Country Churchyard”
 (All poems in section A are marked for annotation)

Section B: Drama

Shakespeare : Hamlet
 Webster : The Duchess of Malfi
 Sheridan : The Rivals
 Section C: Prose and Fiction
 Francis Bacon : “Of Marriage”,
 Joseph Addison : Sir Roger at Church
 Swift : Gulliver’s Travels
 Henry Fielding : Joseph Andrews
 Daniel Defoe : Robinson Crusoe

British Literature - 19th Century

ENG1C02 – BRITISH LITERATURE - 19TH CENTURY

Section A: Poetry

William Blake : The Tiger, The Lamb
 William Wordsworth : Lines Composed a Few Miles above Tintern Abbey
 S.T. Coleridge : Kubla Khan
 P.B. Shelley : Ozymandias
 John Keats: Ode to a Nightingale
 Byron: She Walks in Beauty
 Tennyson: Tithonus
 Browning: Fra Lippo Lippi
 Elizabeth Barret Browning: A Musical Instrument
 Mathew Arnold: Dover Beach
 D.G Rossetti: The Blessed Damozel
 (All poems in section A are marked for annotation)

Section B: Drama

Oscar Wilde: The Importance of Being Earnest



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Section C: Fiction and Prose

Charles Lamb: “Dream Children – A Reverie”

William Hazlitt: On Reading Old Books

Charles Dickens: A Tale of Two Cities

Emily Bronte: Wuthering Heights

Thomas Hardy: Tess of the D’Urbervilles

History Of English Language

ENG1C03 – HISTORY OF ENGLISH LANGUAGE

Section A

Language families - The Indo-European family of languages; Germanic Family of languages and the origin of English - The early history of English language; Old English Period - Scandinavian invasions – Middle English Period: The Impact of the Norman Conquest on the English Language; - Middle English Literature. Modern English Period – Latin and Greek influence – Loan words - The impact of the Renaissance – Bible Translations. Sound changes in English – The Great Vowel Shift - Changes in Grammar, vocabulary phonology and morphology – Semantics – word formations

Section B

Foreign influences on English in the Seventeenth, Eighteenth and the Nineteenth Centuries – Colonialism and the English language – Expansion of Vocabulary – Semantic change- Pidgins and Creoles. Contributions of major writers to the growth of English vocabulary.

Section C

The discrepancy between spelling and pronunciation - Attempts to reform English spelling – Evolution of Standard English - Dialects of English: British and American – English in India – English in the postcolonial world – English as a global language — The rise of ‘englishes’ – impact of Science and Technology – English in the digital age.

Reference

1. F. T. Wood: An Outline History of the English language
2. C. L. Wrenn: The English Language
3. C. Baugh: A History of the English Language
4. David Crystal: English as a Global Language
5. David Crystal: The English Language: A guided Tour of the Language



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

6. Bill Ashcroft, et al : The Empire Writes Back
7. Christian Mair :The Politics of English as a World Language
8. Andreas Sedlatschek : Contemporary Indian English: Variation and Change
9. Pingali Sailaja :Indian English
10. Michael Hanrahan & Deborah L Madsen (Ed.): Teaching, Technology, Textuality: Approaches to NewMedia

Indian Literature In English

ENG1C04 – INDIAN LITERATURE IN ENGLISH

Section A: Poetry

- Toru Dutt : “Our Casuarina Tree”
 Rabindranath Tagore : “The Child”
 Nizzim Ezekiel : “In the Country Cottage”
 Jayantha Mahapatra : “Hunger”
 A.K. Ramanujan : “Obituary”
 R. Parthasarathy : “River, Once”
 Kamala Das : “The Old Playhouse”
 Gieve Patel : “The Ambiguous fate of Gieve Patel, he being neither Muslim nor Hindu in India”
 Meena Alexander : “Blue Lotus”
 Arundhati Subramaniam : “Home”
 MeenaKandasamy :”Dead Woman Walking”
 (All poems in section A are marked for annotation)

Section B: Fiction

- Mulk Raj Anand : Coolie
 R.K. Narayanan : The Guide
 Salman Rushdie : Midnight’s Children
 AmitavGhosh : The Hungry Tide

Section C: Drama

- Girish Karnad : Yayati (English Translation by the author)
 Mahesh Dattani : Tara

Section D: Prose

- JawaharLal Nehru : “What is Culture?”



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Amartya Sen : “Reason and Identity” (From: The Argumentative Indian, Part IV)

Twentieth Century British Literature Up To 1940

ENG2C05 – Twentieth Century British Literature Up To 1940

Section A

G.M. Hopkins : “The Windhover”
W.B. Yeats : The Second Coming, Byzantium
T S Eliot : The Waste Land
W.H.Auden : Funeral Blues
Wilfred Owen : A Strange Meeting

Section B: Drama

GB Shaw : Caesar and Cleopatra
T S Eliot : Murder in the Cathedral
Sean O Casey : Juno and The Paycock

Section C: Prose and Fiction

Virginia Woolf : “Modern Fiction”
Joseph Conrad : Heart of Darkness
D.H. Lawrence : Sons and Lovers
James Joyce : A Portrait of the Artist as a Young Man
(All Poems in section A are marked for annotation purpose also)

Literary Criticism And Theory – Part 1(Up To New Criticism)

ENG2C06 – Literary Criticism And Theory – Part 1(Up To New Criticism)

Section A

Plato : The Republic (Books 2 and 3)
Aristotle : Poetics
Longinus : On the Sublime (Chapters 7 – 9)

Section B

Sir Philip Sydney : An Apology for Poetry



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

William Wordsworth : Preface to Lyrical Ballads
 F. R Leavis : Hard Times: An Analytic note (From 'The Great Tradition')
 T.S. Eliot - : Tradition and Individual Talent
 Cleanth Brooks : The Language of Paradox
 Northrop Frye : The Archetypes of Literature

Section C

S.N. Das Gupta : The Theory of Rasa
 Kunjunni Raja : Theory of Dhvani

American Literature

ENG2C07 – American Literature

Section A

Edgar Allan Poe : The Raven
 Walt Whitman : A passage to India
 Emily Dickinson : There is a certain slant of light
 Robert Frost : Home Burial
 Wallace Stevens : The Emperor of Ice Cream
 EE Cummings : Buffalo Bill
 Langston Hughes :I Too
 Robert Lowell : For the Union Dead
 Allen Ginsberg :America
 Sylvia Plath :Edge
 Gloria E. Anzaldua : To live in the Borderlands means you
 (All poems in section A are marked for annotation)

Section B: Prose and Fiction

Ralph Waldo Emerson : “Self-reliance”
 Herman Melville : Moby Dick
 Mark Twain : Huckleberry Finn
 William Faulkner : The Sound and the Fury
 Tony Morrison : Tar Baby

Section C: Drama

Eugene O'Neill : The Emperor Jones
 Tennessee Williams : The Glass Menagerie



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Amiri Baraka (LeRoi Jones) : Dutchman

Postcolonial Writings

ENG2C08 – POSTCOLONIAL WRITINGS

Section A: Poetry

A. K. Ramanujan : “Self Portrait”

Dom Moraes : “A Letter”, “Sinbad”

Leopold Senghor : “New York”

Gabriel Okara : “The Mystic Drum”

David Diop : “Africa”

Allen Curnow : “House and Land”

A.D. Hope : “Australia”

Jack Davis : “Aboriginal Australian”

Margaret Atwood : “Journey to the Interior”

Derek Walcott : “Ruins of a Great House”

E. E. Tiang Hong : “Arrival”

Almaghir Hashmi : “So What if I Live in a House Made by Idiots”

Kamau Brathwaite : “Negus”

Section B: Drama

Wole Soyinka : The Road

Girish Karnad : Hayavadana

Timberlake Wertenbaker : Our Country’s Good

Section C: Fiction

Chinua Achebe : Things Fall Apart

V. S. Naipaul : A House for Mr. Biswas

Margaret Laurence : The Stone Angel

Khaled Hosseini : The Kite Runner



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Twentieth Century British Literature Post 1940

ENG3C09 – Twentieth Century British Literature Post 1940

Section A: Poetry

Dylan Thomas : “Fern Hill”

Philip Larkin : “Church Going”

Thom Gunn : “On the Move”

Ted Hughes : “View of a Pig”,

Seamus Heaney : “Punishment”

Charles Tomlinson : “Swimming Chenango Lake”

Geoffrey Hill : “In Memory of Jane Frazer”

Elizabeth Jennings : “One Flesh”

Andrew Motion : “The Last Call”

(Annotations will cover the entire section)

Section B: Drama

Samuel Beckett : Waiting for Godot

Caryl Churchill : Top Girls

Harold Pinter : The Birthday Party

Edward Bond : Lear

Section C: Fiction

John Fowles : The French Lieutenant’s woman

Kingsley Amis : Lucky Jim

Alan Sillitoe : Loneliness of the Long Distance Runner

Kazuo Ishiguro : Remains of the Day

Literary Criticism And Theory: Part 2

ENG3C10 – Literary Criticism And Theory: Part 2

1. Structuralism: An Overview



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Major theorists: Ferdinand de Saussure, Claude- Levi-Strauss, Roland Barthes, Gerrard Genette
Key concepts : Structure, Sign, Signifier, Signified, Semiology, Semiotics, Langue and Parole, Mythemes, Structuralist Narratology.

Text for Detailed Study: Roland Barthes: “Structuralist Activity”

2. Post-Structuralism/ Deconstruction: An Overview Major theorists: Jacques Derrida, Roland Barthes, Michel Foucault, The Yale School. Key concepts : Deconstruction of Sign, Decentering, Logocentrism, Aporia, Supplement, The Death of the Author, Knowledge, Power, Discourse.

Text for Detailed Study: Jacques Derrida: “Structure, Sign and Play in the Discourse of Social Sciences”

3. Psychoanalysis: An Overview Major theorists: Sigmund Freud, Jacques Lacan. Key concepts : Id, Ego, Superego, Dream Mechanism, Oedipus Complex, Unconscious, Mirror Stage, Imaginary, Symbolic and Real, Ego Formation and Constructions of Selfhood, Jouissance, Unconscious is structured like a Language.

Text for Detailed Study: Jacques Lacan: “The Mirror Stage as Formative of the Function of the I”

4. Feminism: An Overview

Major theorists: Virginia Woolf, Kate Millet, Elaine Showalter, Helene Cixous, Adrienne Rich. Key concepts : Gynocriticism, Ecriture Feminine, Womanism, The Language Problem in Feminism, Marxist Feminism, French Feminism, Lesbian Feminism, Black Feminism, Dalit Feminism, Post-feminism.

Text for Detailed Study: Elaine Showalter: “Towards a Feminist Poetics”

5. Cultural Materialism/ New Historicism: An Overview Major theorists: Raymond Williams, Jonathan Dollimore, Stephen Greenblatt, Louis Montrose. Key concepts : Neo-Marxism, Culture: New Definitions, Thin and Thick Descriptions, Textuality and

Historicity, Texts, Contexts and Co-texts, Rereading the Renaissance and Shakespeare, The Politics of Representation and Power.

Text for Detailed Study: Louis Montrose: “Professing the Renaissance: The Poetics and Politics of Culture”

6. Postcolonialism: An Overview

Major theorists : Frantz Fanon, Edward Said, HomiBhabha, GayatriSpivak, Benedict Anderson. Key concepts : Critique of Eurocentrism and Universalism, Decolonization,



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National Consciousness, Critiquing Nationalism, Postnationalism, Imagined Communities, Orientalism, Strategic Essentialism, Subaltern Studies, Hybridity, Ambivalence, Mimicry.

Text for Detailed Study: Edward Said: “Jane Austen and Empire”

7. Ecocriticism: An Overview

Major theorists : Jonathan Bate, Cheryll Glotfelty, Laurence Coupe, Patrick DMurphy, William Rueckert.
Key concepts : Anthropocentrism, Shallow Ecology vs Deep Ecology, The Crisis of Humanism, Nature/Culture, Green Studies, Environmental Imagination, Ecofeminism.

Text for Detailed Study: Cheryll Glotfelty: “Introduction: Literary Studies in an age of Environmental Crisis” (From the Ecocriticism Reader)

8. Critiquing Theory: An Overview

Text for Detailed Study: Graham Good: “Presentism: Postmodernism, Poststructuralism, Postcolonialism”

European Fiction In Translation

ENG3E02 – European Fiction In Translation

- Cervantes : Don Quixote
- Gustave Flaubert : Madame Bovary
- Leo Tolstoy : Anna Karenina
- Franz Kafka : The Trial
- Kazantzakis : Zorba, the Greek
- Gunter Grass : The Tin Drum
- Milan Kundera : The Joke
- Orhan Pamuk : Snow
- Jose Saramago : Blindness
- Italo Calvino : If on a winter’s night a traveller

American Ethnic Writing

ENG3E09 American Ethnic Writing



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Section A: POETRY

Diane Glaney - “Without Title”

Maurice Kenney - “They Tell Me I am Lost”, “Amerindian”

Mary Tallmountain - “Good Griecce”, Indian Blood”

Langston Hughes - “The Negro Speaks of Rivers”, “Theme for English B”

Amiri Baraka (LeRoi Jones) - “ Black Art”

Domna Kate Rushin -“The Bridge Poem”

Philip Levine - “Commanding Elephants”, “Sunday Afternoon”, “Jewish American”

Louis Zukofsky - “All of December’s Toward New Year’s”

Sylvia Plath - “Daddy”, “Morning Song”

Gary Soto - “Oranges”

Janice Mirikitani - “Breaking Silence”

Dwight Okita - “In Response to Executive Order 9066”

(All the poems included except those by the Jewish-American writers and the two well-known male Afro-American writers are available in Braided Lives published by Minnesota Humanities Commission, 1991)

Section B: Drama

Lorraine Hansberry - A Raisin’ in the Sun

Amiri Baraka (LeRoi Jones) - Dutchman

Ed Bullins - The Electronic Nigger

Israel Zangwill - The Melting Pot

Section C: Fiction

Scott Momaday - House Made of Dawn

Leslie Marmon Silko - Ceremony



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Ralph Ellison - Invisible Man

James Baldwin - Go tell it on the Mountain

Bernard Malamud - The Assistant

Isaac Bashevis Singer - The Slave

English Literature In The 21st Century

ENG4C11 – English Literature in the 21st Century

Section A: Poetry

Simon Armitage : “A Vision”

Benjamin Zephaniah : “Rong Radio Station”

Martin Espada : “Alabanza: In Praise of Local 100”

Evan Boland : “Atlantis - A lost Sonnet”

DaljitNagra : “Look We Have Coming to Dover”

Sean O’Brien : “Water- Gardens”

Ocean Vuong : “DetoNation”

Terrance Hayes : “I Lock You in an American Sonnet that is Part Prison”

Sarah Howe : “Yangtze”

Jorie Graham : “Fast”

Vijay Nambisan : These were my Homes

Section B: Drama

Tracy Letts : August: Osage County

Lucy Kirkwood : Chimerica

Ayad Akhtar : Disgraced

Section C: Fiction & Prose

Mohsin Hamid : The Reluctant Fundamentalist

Chimamanda Ngozi Adichie : Purple Hibiscus

Richard Powers : The Echo Maker

Viet Thanh Nguyen : The Sympathizer

Ali Smith : Autumn



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Amitav Ghosh : Chapters 1-4 (Part I 'Stories' from The Great Derangement)

David Lodge : “Consciousness and the Two Cultures” (Chapter 1, Consciousness and the Novel)

Indian English Fiction

ENG4E14 – Indian English Fiction

Raja Rao : Kanthapura

Mulk Raj Anand : Coolie

Khushwant Singh : Train to Pakistan

Rohinton Mistry : A Fine Balance

Arvind Adiga : The White Tiger

Deepak Unnikrishnan : Temporary People

Chitra Banerjee Divakaruni : The Palace Of Illusions

Jhumpa Lahiri : The Namesake

Kiran Desai : The Inheritance of Loss

Anees Salim : The Blind Lady's Descendants

Malayalam Literature In English Translation

ENG4E18 – Malayalam Literature In English Translation

Section A: Poetry

Kumaran Asan : “The Fallen Flower”

Vallathol : “Akroon to Ambadi”

Ulloor : “Music of Love”

Changampuzha : “Manaswini”

G. Sankara Kurup : “The Master Carpenter”

Balamani Amma : “Mother’s Heart”

Vyloppilli : “The Mother Tigress in the Zoo”

N.V. Krishna Variyar : “The Rats”

Sugatha Kumari : “Colossus”

O.N.V. Kurup : “Blue Fish”

Section B: Fiction

O. Chandu Menon : Indulekha



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

C.V. Raman Pillai : Marthanda Varma
Thakazhi : Chemmeen
Basheer : My Granddad had an Elephant
Kesava Dev : From The Gutter
M.T. Vasudevan Nair : Mist
O.V. Vijayan : The Legend of Kazak

Section C: Drama

N. Krishna Pillai : Investment (Kerala Sahitya Akademi, Thrissur)
C. J. Thomas : Behold, He Comes Again
Thoppil Bhasi : Capital

G. Sankara Pillai : Bharata Vakyam

K.J. Baby : Nadugadhika

Elementary Medical Physics

PHY5D01(3): Elementary Medical Physics

Unit 1 Nuclear medicine physics

Nuclear physics -Introduction to Radioactivity-Artificial and natural-Physical features of radiation, conventional sources of radiation, Interaction of different types of radiation with matter-Ionizing & Non ionizing Radiations-excitation, ionization, an radioactive losses- Neutron interactions, Rayleigh scattering-Compton scattering-photoelectric effect-Pair production (Qualitative Study only), Radiation quantity and quality-Radiation exposure, Units of radiation dose, Measurement of radiation dose, safety, risk, and radiation protection-Radiopharmaceuticals
-Radioactive agents for clinical studies- Biological effects & Genetic effect of radiation.

Unit 2 Medical instrumentation

Measurements of Non electrical parameters: Respiration-heart rate-temperature-blood pressure - Electrocardiography (ECG): Function of the heart-Electrical behaviour of cardiac cells-Normal and Abnormal cardiac rhythms-Arrhythmias Electro-encephalography(EEG): Function of the brain-Bioelectric potential from the brain-Clinical EEG-Sleep patterns-The abnormal EEG, Electromyography(EMG): Muscular servomechanism-Potentials generated during muscle actions

Unit 3 Medical imaging techniques



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

ray imaging-properties of X -rays- Production of X-rays--Planar X-ray imaging instrumentation-X-ray fluoroscopy. Ultrasound imaging- generation and detection of ultrasound- Properties -reflection - transmission- attenuation -Ultrasound instrumentation- Principles of A mode, B-mode-M-mode Scanning, Hazards and safety of ultrasound.

Books of study:

W.R.Hendee & E.R.Ritenour, Medical Imaging Physics (4th edn) Wiley New York,
John G. Webster, "Medical Instrumentation Application and Design", John Wiley and sons, New York, 1998.,
Khandpur R.S, "Handbook of Biomedical Instrumentation", Tata McGraw- Hill,New Delhi, 1997.

Reference books:

Medical Physics by Glasser 0, Vol 1,2,3 Year Book Publisher Inc Chicago
Leslie Cromwell, "Biomedical Instrumentation and measurement", Prentice hall of India, New Delhi, 1999.
John G. Webster, "Medical Instrumentation Application and Design", John Wiley and sons, New York, 1998.
Khandpur R.S, "Handbook of Biomedical Instrumentation", Tata McGraw-Hill, New Delhi, 1997.
5 .. Joseph J.carr and John M. Brown, "introduction to Biomedical equipment Technology", John Wiley and sons, New York, 1997..
W.R.Hendee & E.R.Ritenour, Medical Imaging Physics (3'd eds), Mosbey Year- Book, Inc., 1992.
Hendee & E.R.Ritenour, Medical Physics.

Non-Conventional Energy Sources

PHY5D01(1): NON-CONVENTIONAL ENERGY SOURCES

UNIT I

Energy Resources-Non-Conventional Energy Sources-Renewable and Non-Renewable energy sources.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

(Section 1.3, 1.4 and 1.5 from Non- Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers, 1st Edition.)

UNIT II

Solar energy

Solar Energy Terms and Definitions- Solar Constant, Solar radiation measurements, Solar energy collector, Physical principle of the conversion of solar radiation in to heat, solar air heaters and drying, solar cookers, solar distillation, solar furnaces, solar greenhouses, solar power plants, solar photovoltaic cells (no need of mathematical equations)

(Section 2.2.1 and 2.2.2, 2.3, 3.1.2, 3.1.3-3.1.5, 3.2, 3.3.1-3.3.3, 3.4.1-3.4.10, 4.16, 4.17, 4.18, 4.19,4.20, 4.21.4, 4.21.8, 4.21.9, 4.21.10, 4.21.4 from Non- Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers, 1st Edition.)

UNIT III

Wind energy

10 Hours

Introduction, Utilisation aspects of wind energy, Advantages and Disadvantages of wind energy, Environmental impact of wind energy, Sources/Origins of wind, Principle of wind energy conversion and wind power, Basic components of wind energy conversion system (WECS), Advantages and Disadvantages of WECS, Wind-Electric Generating Power Plant, Wind Energy Economics, Problems in operating large wind power generators.

(Section 5.1-5.6, 5.8, 5.10, 5.11, 5.20, 5.25, 5.26 from Non- Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers, 1st Edition.)

UNIT IV

Geothermal energy

16 Hours



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Introduction to Geothermal energy, Important aspects of Geothermal Energy, Structure of Earth’s interior, Geothermal System-Hot Spring structure, Geothermal Resources (Hydrothermal, Geopressured, Petro-thermal system, Magma Resources), Advantages and disadvantages of geothermal energy over other energy forms, application of geothermal energy.

(Section 7.1, 7.2, 7.3, 7.5, 7.8.1, 7.8.2, 7.8.3, 7.8.4, 7.9, 7.10 from Non- Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers, 1st Edition.)

Energy from biomass:

Introduction to biomass, Biomass resource, Biomass Conversion process (Densification, Combustion and incineration, Thermo Chemical conversion, Biochemical conversion), Biogas: Biogas Applications, Biogas Plants (Raw materials used, Main Components of a Biogas Plant)

(Section 6.1, 6.2, 6.5.1, 6.5.2, 6.5.3, 6.5.4, 6.6.1, 6.6.2, 6.7.1, 6.7.2, 6.7.3 from Non-Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers, 1st Edition.)

UNIT V

Energy from Oceans and Thermal and Chemical effects

12 Hours

Ocean Energy, Ocean Energy Sources, Tidal energy, Components of a Tidal Power Plant, Economic aspects of tidal energy conversion, Wave energy, Advantages and disadvantages, Factors affecting Wave energy, Ocean Thermal Energy Conversion (OTEC), Working principle of OTEC, Efficiency of OTEC, Types of OTEC Plants (Closed system, Thermoelectric OTEC system), Advantages and Disadvantages and Applications of OTEC.

Thermo electric effects, Fuel Cells, Hydrogen energy, Nuclear Reactors, Advantages and Disadvantages of Nuclear power plants (Basic Principles/concepts only)

(Section 8.1, 8.2, 8.3.1, 8.3.8, 8.3.14, 8.4.1, 8.4.2, 8.4.3, 8.5.1, 8.5.3, 8.5.4, 8.5.5.1, 8.5.5.5, 8.5.6, 9.2, 9.7.1, 9.7.2, 9.7.3, 10.1, 10.2, 10.3, 11.2.1, 11.5 from Non- Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers, 1st Edition.)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Books of study:

1. Non- Conventional Energy Sources and Utilisation by R.K.Rajput, S.Chand Publishers

References

1. Non- Conventional Energy Resources by G. D. Rai, Khanna Publishers, 2008.
2. Solar Energy Fundamentals and application by H.P. Garg and J. Prakash, Tata McGraw- Hill Publishing company Ltd, 1997.
3. Solar Energy by S. P. Sukhatme, Tata McGraw- Hill Publishing company ltd,1997.
4. Solar Energy Utilization by G.D. Rai, Khanna Publishers, 1995.

Entrepreneurship Development

EC4A13 : Entrepreneurship Development

Module I : 15 Hours, 15 Marks

Concepts of entrepreneur: Entrepreneur- Definitions - **Characteristics of entrepreneur** Classification of entrepreneur-Entrepreneurial traits -Entrepreneurial functions - **role of entrepreneurs in the economic development** - Factor effecting entrepreneurial growth – Entrepreneurship – Meaning – definition - Entrepreneur vs Intrapreneur– **Women Entrepreneurs** - Recent development – Problems - Entrepreneurial Development Programmes - Objectives of EDP - Methods of training - Phases of EDP.

Module II : 17 Hours, 15 Marks

Institutional support and incentives to entrepreneurs- Functions of Department of Industries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)-Functions of National Small Industries Corporation(NSIC)- Functions of Small Industries Development Bank of India (SIDBI) - Khadi Village Industry Commission



CRITERION	I	Curricular Aspects
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(KVIC)-Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology Entrepreneurship .Development Project (STEDP)-Strategies of National entrepreneurship Development Board (NEDB) -Objectives of National Institute for entrepreneurship and small business development (NIESBUD) - Techno park-Functions of techno park Incentives- Importance Classification of incentives – Subsidy - Types of Subsidy

Module III : 15 Hours, 15 Marks

Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund TrustScheme for MSMEs - Industrial estates-Classification-Benefits- Green channel-Bridgecapital- Seed capital assistance-Margin money schemes –Single Window System- **Sickness Causes** –Remedies- Registration of SSI.

Module IV : 18 Hours, 20 Marks

Setting up of Industrial unit-(Only Basic study) **Environment for Entrepreneurship** – Criteria for selecting particular project- Generating project ideas-Market and demand analysis Feasibility study- Scope of technical feasibility- Financial feasibility- **Social cost benefit analysis**-Government regulations for project clearance-Import of capital goods-approval offoreign collaboration-**Pollution control clearances**- Setting up of micro small and mediumenterprises-**Location decision**- Significance.

Module V : 15 Hours, 15 Marks

Project Report - Meaning-Definition - Purpose of project reports-Requirements of good report - Methods of reporting - General principles of a good reporting system - Performa of a project report - Sample project report. (The preparation of sample project report shall be treated as an assignment of this course).

Textbooks :

1. Shukla M.B. Entrepreneurship and small Business Management,Kitab Mahal Allahabad.
2. Sangram Keshari Mohanty, Fundamentals of entrepreneurship,PHI,New Delhi.
3. Nandan H. Fundamentals of Entrepreneurship,PHI, NewDelhi.
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing ,Delhi
5. C.N.Sontakki,Project Management,Kalyani Publishers, Ludhiana.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

6. Sangam Keshari Mohanty. Fundamentals of Entrepreneurship, PHI, NewDelhi
7. Peter F. Drucker- Innovation and Entrepreneurship.
8. Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.
9. MSME Act 2006.

Public Health, Sanitation & Safety

EC4A14: Public Health, Sanitation & Safety

UNIT 1(8 Hours)

Health-Physical, Mental, Social – Positive health– **Quality of life Index.**

Health programmes: Health programmes control measures in operation in India - tuberculosis, poliomyelitis, leprosy, filariasis and diphtheria. Health situation in India – Health Problems-Primary health care in India – PHCs National Programmes for elimination of diseases

UNIT 2(8 hours)

Disposal of sewage: disposal of sewage and night soil – treatment of sewage system
Waste disposal- Disposal of solid waste; Waste water handling: Pre-treatment, primary treatment, secondary treatment, tertiary treatment and disinfection.

UNIT 3(8 hours)

Sanitation: Definition and meaning. Microbial growth pattern and factors affecting microbial proliferation. Assessment of microbial load- Total plate count technique, spread plate technique, indicator or dye reduction test.
water supply sources – impurities and purification of water - water borne diseases and air borne diseases. methods of disease transmission.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

UNIT 4 (8 hours)

Principles of hygiene: General principles of hygiene – its relation to food preparation and food handling habits.

Personnel hygiene- Meaning and importance; Hygienic practices of employees; personal hygiene and contamination of food products-Sanitation Training and Education for Food Service Workers

UNIT 5(10 hours)

Contamination: Sources of contamination and protection against contamination.

Methods of killing micro-organism- Use of heat, chemicals and radiation.

Methods of inhibiting microbial growth- Use of refrigeration, chemicals, dehydration and fermentation

UNIT 6 (10 hours)

Food Borne infection, intoxication: Food poisoning – causes and types – Definition, Exotoxin, Endotoxin, intoxications control measures food borne intoxication and infection – sources – effects and prevention. symptoms and control: *Botulism, Staphylococcus, E.coli and salmonella*. Food infections – sources, symptoms Methods of Prevention and investigation of food borne disease outbreak

UNIT 7(12 hours)

Occupational Safety, Health and Environment: Definition-safety at work place- safe use of machines and tools-hazard-physical hazard (noise, radiation, fire, Electrical, illumination)-chemical hazard-biological hazard-Personal Protective Equipment - Accident preventive techniques-First Aid-Plant Layout for safety-safety of different sectors

References:

- 1.Parke. K. 2007. Text book of preventive and Social Medicine 19th Edition, M/s. Banaraisdasis Bhanet Publishers, Jabalpur, India.



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2. William, C., Frazier and Dennie. C Westheff. 1996. Food Microbiology 4th Edition, Tata McGrahill Company Limited
3. S.Roday – Food Hygiene and Sanitation
4. M. Jacob. (1989) – Safe food Handling.
5. V.N. Reinhold – Principles of Food Sanitation
6. B.C.Hobbs & R.J.Gilbert – Food Poisoning and Hygiene.

Microsoft Excel With VBA and Business Analytics

SDC2ME05 - Microsoft Excel with VBA and Business Analytics

MODULE 1[10 T]

Introduction to Spreadsheets, Understanding Microsoft Excel, Workbook, Cells, Range in Excel, Selecting Cells, Auto Fill, Cell Referencing- Using Absolute and Relative References, creating new worksheet, Formulas and Functions---Mathematical Functions: SUM, PRODUCT, SQRT. ROMAN and ROUND -Statistical Functions: AVERAGE, MEDIAN, MODE, STDEV, CORREL and FORECAST, Financial Functions: DB, SLN, SYD, PMT, NPER, IPMT, PMT, (Annuity Functions, Investment analysis functions, Bond Functions, Depreciation Functions) PV, NPV, Loops, Do While Loops, Do Until Loops, Loop Control XNPV, IRR, MIRR and XIRR Database Functions: DMAX, MIN, DAVERAGE, DCOUNT and DSUM. Defining Names in Excel, Excel-Formatting of Excel Sheets, Sorting Data, Using Excel Tables & formula, Filtering Data in Excel, Understand Charts, Chart Design Options, Sensitivity Analysis using Excel-Scenario Manager, Other Sensitivity Analysis Features, Goal Seek, Data Tables, What-If Analysis, Introduction to functions such as the IF, nested IF, VLOOKUP and HLOOKUP in Excel.

MODULE 2[9T]

Quick Analysis--Quick Analysis with TOTALS, Sum, Average, Count, %Total, Running Total, Sum of Columns, Sorting, Filtering. Subtotals with Ranges-Subtotals, Nested Subtotals, Introduction to charts and graphs in Excel. Constructing various Line, Bar and Pie charts. Using the Pivot chart features of Excel, Understanding and constructing Histograms and Scatterplots, Data Filter and Sort, Importing Data into Excel. VBA-OVERVIEW, VBA- EXCEL, VBA—EXCEL TERMS- Modules, Procedure, VBA —



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MACRO COMMENTS VBA—MESSAGEBOX, VBA—INPUTBOX, VBA—VARIABLES, Data Types
VBA —

CONSTANTS, VBA — OPERATORS-- The Arithmetic Operators, The Comparison Operators, The Logical Operators, The Concatenation Operators VBA, VBA — DECISIONS- If Statement, If Else Statement, If Elseif - Else statement, Nested If Statement, Switch Statement,

MODULE 3[10 T]

VBA — LOOPS, For Loop, For Each Loops, While Wend Statements, Exit For, Exit Do, VBA — STRINGS -- Instr, InString Reverse, LCase, UCase, Left, Right, Mid, Ltrim , Rtrim, Trim , Len , VBA—DATE-TIME FUNCTION

,VBA—ARRAYS , VBA – USER-DEFINED FUNCTIONS – Function,

Definition Calling a Function, VBA — SUB PROCEDURE- Calling Procedures, VBA— EVENTS- Worksheet Events, Workbook Events, Worksheet Events.

MODULE 4[8T]

Error Trapping , Understanding error handling , Understanding VBA's error trapping options , Trapping errors with the on error statement , Understanding the error object , Writing an error handling routine , Working with inline error handling Debugging the Code , Defining errors , Working with debugging tools , Determining breakpoints , How to step through code , Working with break mode during run mode , Identifying the value of expressions

MODULE 5[8T]

Introduction to business analytics: IT in business (CRM, Fraud Detection), Business Analytics vs data science, Introduction to Business Analytics applications-Data visualization tools, Business Intelligence, Self -service analytics, Big data. Web and Mobile Analytics: Text Analytics, Click Analytics, Sentiment Analytics, Google Analytics, CASE STUDIES: Population Census, Marketing, Banking, Retail, Industrial, Mining Patterns, Making models, Model selection and validation.

References:

- d. Excel 2010 power programming with VBA-John Walkenbach
- e. Excel 2007 with VBA-John Green,Rob Bovey
- f. Business Analytics by James Evans
- g. Introduction to Business Analytics Using Simulation by Jonathan Pinder



CRITERION	I	Curricular Aspects
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Circuit Design for IoT with Raspberry Pi

SDC3CD10 - Circuit Design for IoT with Raspberry Pi

MODULE 1[10 T]

Preparing our IoT Projects -Creating the sensor project, creating the actuator project, creating a controller, Creating a camera. The HTTP Protocol-HTTP basics, Adding HTTP support to the sensor, Adding HTTP support to the actuator, Adding HTTP support to the controller.

MODULE 2[12 T]

The UPnP Protocol-Introducing UPnP, creating a device description document, Creating the service description document, providing a web interface, Creating a UPnP interface, Implementing the Still Image service, Using our camera. The CoAP Protocol- Making HTTP binary, Adding CoAP to our sensor, Adding CoAP to our actuator, Using CoAP in our controller

MODULE 3[12 T]

The MQTT Protocol-Publishing and subscribing, Adding MQTT support to the sensor, Adding MQTT support to the actuator, Adding MQTT support to the controller, The XMPP Protocol- XMPP basics, Adding XMPP support to a thing, providing an additional layer of security, Adding XMPP support to the actuator, Adding XMPP support to the camera, Adding XMPP support to the controller, Connecting it all together.

MODULE 4[16 T]

Using an IoT Service Platform-Selecting an IoT platform, The Clayster platform, Interfacing our devices using XMPP, Creating our control application.

Creating Protocol Gateways, understanding protocol bridging, Using an abstraction model, The basics of the Clayster abstraction model, Understanding the CoAP gateway architecture. **Security and Interoperability-Understanding the risks, Modes of attack, Tools for achieving security, The need for interoperability**

MODULE 5[10 T]

Sensors

Definition, Types, Basic principle and applications of Resistive, Inductive, Capacitive, Piezoelectric and their Dynamic performance. Fiber optic sensors, Bio-chemical sensors,

Hall-Effect, Photoemissive, Photo Diode/ Photo Transistor, Photovoltaic, LVDT, Strain Gauge Digital transducers: Principle, Construction, Encoders, Absolute and incremental encoders, Silicon micro transducers.

References

1. Learning Internet of Things, Peter Waher.
2. Raspberry Pi IoT Projects, Prototyping Experiments for Projects, John C Shovic
3. Ramakant A. Gayakwad- “Op Amps and Linear integrated circuits” – PHI2008



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. D. Roy Choudhury, Shail B Jain – “Linear Integrated circuits”, New Age international (P)Ltd,2010
5. Kennedy’s Electronic communication system – George Kennedy, Bernard Davis, S RM Prasanna,5e, Mc Graw Hill Education
6. David A. Bell, “Electronic Devices and Circuits”, Oxford University Press, 5th Edition, 2008.
7. D.P. Kothari, I. J. Nagrath, “Basic Electronics”, McGraw Hill Education (India) Private Limited, 2014.

Entrepreneurship Development

EC4A13: Entrepreneurship Development

Module I: 15 Hours, 15 Marks

Concepts of entrepreneur: Entrepreneur- Definitions - **Characteristics of entrepreneur**
 Classification of entrepreneur-Entrepreneurial traits -Entrepreneurial functions - **role of entrepreneurs in the economic development** - Factor effecting entrepreneurial growth – Entrepreneurship – Meaning – definition - Entrepreneur vs Intrapreneur– **Women Entrepreneurs** - Recent development – Problems - Entrepreneurial Development Programmes - Objectives of EDP - Methods of training - Phases of EDP.

Module II: 17 Hours, 15 Marks

Institutional support and incentives to entrepreneurs- Functions of Department of Industries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)-Functions of National Small Industries Corporation(NSIC)- Functions of Small Industries Development Bank of India (SIDBI) - Khadi Village Industry Commission (KVIC)-Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)- Activities of Science and Technology Entrepreneurship .Development Project (STEDP)- Strategies of National entrepreneurship Development Board (NEDB) -Objectives of National Institute for entrepreneurship and small business development (NIESBUD) -



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Techno park-Functions of techno park Incentives- Importance Classification of incentives – Subsidy - Types of Subsidy

Module III: 15 Hours, 15 Marks

Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund TrustScheme for MSMEs - Industrial Estates-Classification-Benefits- Green channel-Bridgecapital- Seed capital assistance-Margin money schemes –Single Window System- **Sickness Causes** –Remedies- Registration of SSI.

Module IV: 18 Hours, 20 Marks

Setting up of Industrial unit-(Only Basic study) **Environment for Entrepreneurship** – Criteria for selecting particular project- Generating project ideas-Market and demand analysis Feasibility study- Scope of technical feasibility- Financial feasibility- **Social cost benefit analysis**-Government regulations for project clearance-Import of capital goods-approval of foreign collaboration-**Pollution control clearances**- Setting up of micro small and medium enterprises-**Location decision**- Significance.

Module V: 15 Hours, 15 Marks

Project Report - Meaning-Definition - Purpose of project reports-Requirements of good report - Methods of reporting - General principles of a good reporting system - Performa of a project report - Sample project report. (The preparation of sample project report shall be treated as an assignment of this course).

Textbooks:

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2. angram Keshari Mohanty, Fundamentals of entrepreneurship,PHI,New Delhi.
3. Nandan H. Fundamentals of Entrepreneurship,PHI, NewDelhi.
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing ,Delhi
5. C.N.Sontakki,Project Management,Kalyani Publishers, Ludhiana.
6. Sangam Keshari Mohanty. Fundamentals of Entrepreneurship, PHI, NewDelhi
7. Peter F. Drucker- Innovation and Entrepreneurship.
8. Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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9. MSME Act 2006.

Public Health, Sanitation & Safety

EC4A14 Public Health, Sanitation & Safety

Unit 1

Health-Physical, Mental, Social – Positive health– **Quality of life Index.**

Health programmes: Health programmes control measures in operation in India - tuberculosis, poliomyelitis, leprosy, filariasis and diphtheria. Health situation in India – Health Problems-Primary health care in India – PHCs National Programmes for elimination of diseases

UNIT 2(8 hours)

Disposal of sewage: disposal of sewage and night soil – treatment of sewage system **Waste disposal-** Disposal of solid waste; Waste water handling: Pre-treatment, primary treatment, secondary treatment, tertiary treatment and disinfection.

UNIT 3(8 hours)

Sanitation: Definition and meaning. Microbial growth pattern and factors affecting microbial proliferation. Assessment of microbial load- Total plate count technique, spread plate technique, indicator or dye reduction test.

water supply sources – impurities and purification of water - water borne diseases and air borne diseases. methods of disease transmission.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

UNIT 4 (8 hours)

Principles of hygiene: General principles of hygiene – its relation to food preparation and food handling habits.

Personnel hygiene- Meaning and importance; Hygienic practices of employees; personal hygiene and contamination of food products-Sanitation Training and Education for Food Service Worker UNIT 5(10 hours)

Contamination: Sources of contamination and protection against contamination.

Methods of killing micro-organism- Use of heat, chemicals and radiation.

Methods of inhibiting microbial growth- Use of refrigeration, chemicals, dehydration and fermentation

UNIT 6 (10 hours)

Food Borne infection, intoxication: Food poisoning – causes and types – Definition, Exotoxin, Endotoxin, intoxications control measures food borne intoxication and infection – sources – effects and prevention. symptoms and control: *Botulism, Staphylococcus, E.coli and salmonella*. Food infections – sources, symptoms Methods of Prevention and investigation of food borne disease outbreak

UNIT 7(12 hours)

Occupational Safety, Health and Environment: Definition-safety at work place- safe use of machines and tools-hazard-physical hazard (noise, radiation, fire, Electrical, illumination)-chemical hazard-biological hazard-Personal Protective Equipment - Accident preventive techniques-First Aid-Plant Layout for safety-safety of different sectors

References:

1. Parke. K. 2007. Text book of preventive and Social Medicine 19th Edition, M/s. Banaraisdasis Bhanet Publishers, Jabalpur, India.
2. William, C., Frazier and Dennie. C Westheff. 1996. Food Microbiology 4th Edition, Tata McGrahill Company Limited
3. S.Roday – Food Hygiene and Sanitation
4. M. Jacob. (1989) – Safe food Handling.
5. V.N. Reinhold – Principles of Food Sanitation
6. B.C.Hobbs & R.J.Gilbert – Food Poisoning and Hygiene.



CRITERION	I	Curricular Aspects
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Food Safety, Food Laws & Packaging Technology

SDC3FS6: Food Safety, Food Laws & Packaging Technology

COURSE OUTCOME

- To impart knowledge of various areas related to food processing and packaging.
- To enable the students to familiarize with different processing and preservation techniques of variety foods.
- To emphasize the importance of food safety, food laws and regulations
- To enable the students to understand packaging materials and effective packaging processes.

COURSE OUTLINE:

1. Food Safety & Hygiene 4hrs

Importance of Food Safety, Food Hygiene, High risk food, Low risk food, Danger Zone, Personal hygiene

2. Food Safety and Quality Management 8hrs

GHP, GMP, SOP, HACCP (Food contaminants- Physical, Chemical, Biological and Allergens), ISO 22000, ISO 9001, Codex Alimentarius Commission (Codex), FAO

3. Traceability & Recalling & sampling 8hrs

Traceability-Objectives and Applications, recalling of products, its procedure, Sampling, Sample collection, sampling tools, Sampling procedure, Analysis.

4. Food Plant Sanitation 4hrs

Structural requirements, SSOP, CIP, Chlorination, Detergents, Disinfectants and Sanitizers

5. Food Laws & Regulations 10hrs

Food Safety and Standards Act, FDA, Evolution in Food laws and regulations- PFA, FPO, AGMARK, BIS,

6. Food Adulteration 2hrs

Common Food adulterants and their tests: Milk, Vegetable oil, Spices, Tea, Pulses, Sugar, honey

7. Introduction to Food Packaging 4hrs

Definition, functions & Properties. Classification of packaging – Primary, Secondary, Tertiary Packaging. Flexible, Rigid & semi rigid packaging materials.

8. Types of packages & Technologies 5hrs



CRITERION	I	Curricular Aspects
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Metal, Glass, Paper, Plastic, Retortable Pouches, CAP, MAP, Smart, active, Aseptic, Biodegradable, Edible packages. Packaging symbols, Nutritional labelling.

REFERENCE

- Sunetra Rodey. "Food hygiene and sanitation with case studies"
 - Richard A sprenger, "Hygiene for Management" High field
 - Puja Dudeja; Amarjeet Singh; "Food safety implementation from farm to fork"
 - Guideline for food recall-FSSAI
 - Sunetra Rodey. "Food hygiene and sanitation with case studies"
 - Sukhneet Suri, Anita Malhotra; "Food science Nutrition and safety". FSSAI Manual; www.fssai.gov.in
 - B Sreelekshmi; "Food science"
 - FSSAI manual on general guidelines on sampling
 - Mathlouthi, M Food Packaging and Preservation . Aspen
 - Larousse, Jean Food Canning Technology Wiley-VCH
 - Mahadeviah M & Gowramma RV 1996 Food Packaging Materials. Tata McGraw Hill
 - Painy FA. 1992 A Hand Book of Food Packaging. Blackie Academic
 - Stanley S & Roger CG 1970 Food Packaging AVIPubl
 - Gupta, Ajay KR Handbook on Modern Packaging Industries Asia Pacific Business Press Inc
 - Srinivasa Gopal TK Sea Food Packaging CIFT. Cochin
 - Robertson, Gordon L. Food Packaging Marcel Dekker Inc.
- Hand book of Packaging Technology. Engineering India Research Institute

Byproduct Utilization and Waste Management

SDC5BU14: Byproduct Utilization and Waste Management

COURSE OUTCOME:

- To get the deep knowledge about the type of waste, its generation and the importance of waste management
- To obtain knowledge about effluent treatment
- To understand the waste utilization in agro industries



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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- To understand the concept of waste utilization of animal and marine product industry

COURSE OUTLINE:

Module I: Introduction 4 Hrs

Scope and importance of waste management and effluent treatment.

Module II: Waste characterization 6 Hrs

Temperature, pH, Oxygen demands (BOD, COD, TOD), fat, oil and grease content, metal content, forms of phosphorous and sulphur in waste waters, microbiology of waste

Module III: Effluent Treatment 8Hrs

Pretreatment of waste: sedimentation, coagulation, flocculation and floatation Secondary treatments: Biological oxidation (trickling filters, activated sludge process), industrial wastewater treatment: characteristics of industrial wastewater, treatment levels.

Module IV: Waste utilization of agro industries 8 Hrs

Characterization and utilization of byproducts from cereals (breweries), pulses, oilseeds, fruits & vegetables (wineries) and plantation crops (sugar industries).

Module V: Waste utilization of animal and marine product industries 4 Hrs

Characterization and utilization of byproducts from dairy, eggs, meat, fish and poultry.

REFERENCES:

1. Abbas Kazmi, Peter Shuttleworth, (2013), "The Economic Utilisation of Food CoProducts", Royal Society of Chemistry Publishing.
2. A.M. Martin, (2012), "Bioconversion of Waste Materials to Industrial Products", Springer Science & Business Media Publishing.
3. Marcos von Sperling,(2007), "Basic Principles of Wastewater Treatment", IWA Publishing.

Introducing Literature

ENG1B01 Introducing Literature

Module 1: Language and its Literary Nuances

Signifying Devices

The Syntax: Verb Phrases, Adjuncts, Collocations, Linkers, Sense Groups

The Poetic: Comparisons, Exaggerations, Images, Symbols, Iamb, Trochee, Caesura, Enjambment



CRITERION	I	Curricular Aspects
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Texts:

1. Ruskin Bond “Eyes of the Cat”
2. Anton Chekhov “The Death of a Clerk”
3. Alfred Lord Tennyson “The Oak”
4. Langston Hughes “Dreams”
5. Emily Dickinson “Because I could not Stop for Death”

Module 2: Polyphonic Texts

Point of view (diegesis), polyphony and its rationale, single perspective and its dangers

Texts:

1. Freya Stark *Winter in Arabia* (excerpts)
2. Laura Bohannan “Shakespeare in the Bush”
3. Akira Kurosawa dir. *Rashomon*

Module 3: Literature and Ideology

The workings of power structures in literature; explication of the terms -ideology, hegemony, interpellation, discourse, grand narratives, little narratives – using literary texts; literary devices like irony and paradox and their role in reinforcing ideology.

Texts:

1. Arundhati Roy “The God of Small Things”
2. Charlotte Bronte “Jane Eyre”
3. George Orwell “A Hanging”
4. Hansda Sowvendra Shekhars “The Adivasi will not Dance”

Module 4: Perspective of the Subaltern

Dominant voices, marginalized voices, subaltern identities, resisting the norm/authority

Texts:

1. RK Narayan *Swami and Friends* (Excerpt from Chapter XI “In Father’s Presence”)
2. Arun Kamble “Which language should I Speak?” and FM Shinde “Habit”
3. The Letter Q: Ely Shipley <<https://www.poets.org/poetsorg/text/letter-q-ely-shipley>>Maxine Hong Kingston “No Name Woman”



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Appreciating Poetry

ENG2B02 Appreciating Poetry

Module 1: Poetry- Some Key Concepts

Basic Elements of Poetry: Prosody: Rhythm, Meter – Rhyme - hard rhyme, soft rhyme, internal rhyme - Alliteration, Assonance – Diction.

Figures of Speech: Metaphor, Simile, Personification, Oxymoron, Metonymy, Synecdoche, Transferred Epithet.

Poetic Forms: Lyric, Ode, Sonnet, Haiku, Ballad, Couplet, Villanelle, Dramatic Monologue, Elegy, Satire, Mock Epic, Free Verse, Tanka, Jintishi, Ghazal, Rubai, Prose poetry, Narrative poetry, Performance Poetry.

Module 2: Poetic Forms

1. Sonnet: William Shakespeare: Shall I Compare thee to a Summer's Day (Sonnet XVIII), John Milton: On His Blindness
2. Ballad: John Keats: La Belle Dame sans Merci
3. Ode: P B Shelley: Ode to a Skylark
4. Elegy: W H Auden: In Memory of W. B. Yeats
5. Villanelle: Dylan Thomas: Do not go Gentle into that Good Night
6. (Dramatic) Monologue: Robert Browning: My Last Duchess
7. Metaphysical: John Donne: A Valediction Forbidding Mourning
8. Heroic Couplet: Alexander Pope: Extract from *Essay on Man* (Epistle I, Section II), "Presumptuous man! The reason wouldst thou find..."
9. Free Verse: Stanley Kunitz: The Layers
10. Song: Leonard Cohen: I'm your Man

Module 3: World Poetry

1. Childhood: Rainer Maria Rilke: Childhood
2. Love and Loss: Pablo Neruda: Tonight I Can Write the Saddest Lines
3. Protest: Nazim Hikmet: Some Advice to those who will Serve Time in Prison



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. Family: Langston Hughes: Mother to Son
5. Survival: Namdeo Dhasal: Stoneman, My Father & Me
6. Alienation: Diane Glancy: Without Title
7. War: Yehuda Amichai: Anniversaries of War
8. Environment: Joao Cabral de Melo Neto: Landscape of the Capibaribe River
9. Commitment and Passion: Charles Baudelaire: Be Drunk
10. Cultural Difference: Bassey Ikpi: Homeward

Module 4: Appreciation of Poetry

Students can be briefed about how to analyze a poem. A few poems other than those given for the detailed study can be given to the students for practical analysis.

*NB: The learners are asked only short essay/s (paragraph/s) questions for appreciation (based on unseen poems) in the end semester examinations.

Appreciating Prose

ENG3B03 Appreciating Prose

Module 1: Introduction to Prose

Etymology – Prose varieties –Fiction/Short Story/Tales -Autobiography/Biography - Newspaper/Journal Articles -Philosophical/Scientific Essays –Travelogues –Speech. Functions of prose. Evolution of Prose - Early translations- King Alfred- the Anglo Saxon Chronicle- homilies- bible translations-secular prose-Morte D’arthur- Elizabethan prose-tracts, pamphlets and treatises- eighteenth century prose – Victorian and modern prose.

- Essay – formal/impersonal essay and informal/personal essay
- Types of formal essays: periodical essay, critical essay
- Personal essays /Life Writing: biography, autobiography, memoir and diaries.

Module 2:Reflections and speeches



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Francis Bacon : Of Studies
2. Charles Lamb : Dream Children :A Reverie.
3. G. K Chesterton : On Running After One’s Hat
4. Albert Camus : Nobel Acceptance Speech
5. **Arundhati Roy : Come September**
6. Pico Iyer : In Praise of the Humble Comma (Biography/Autobiography/ Memoir)
7. Chinua Achebe : The Education of a British Protected Child(extract from the text.)
8. **Marcel Junod : The First Atom Bomb. (extract from Warrior Without Weapons, translated by Edward Fitzgerald.)**
9. Usha Jesudasan : Justice vs Mercy

Voices of Women

ENG6B11 Voices of Women

Module 1: Essays

1. Chimamanda Ngozi Adichie: We Should All Be Feminists
2. Virginia Woolf: Shakespeare's Sister

Module 2: Poetry

1. Eunice D Souza: Bequest
2. Amy Lowell: Vintage
3. Sappho: To Anactoria in Lydia
4. Inez Hernandez Avila: To Other Women Who Were Ugly Once
5. Judith Wright: Eve to her Daughters

Module 3: Fiction

Novel: Kate Chopin : The Awakening Short stories

Clarice Lispector : Preciousness 2. Alice Walker: The Flowers



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Module 4: Drama and Film

Thozhilkendrathilekku

At Five in the Afternoon : dir. Samira

Makhmalbuf Mustang : dir Denize

Gamze Erguven

Writing For The Media

ENG6B17 Writing For The Media

Module 1: Technical Writing

Definition- types of technical writing- structure of user manuals, technical descriptions, instructions and accessories –dissertation and thesis writing

Module 2: Writing For Audio Visual Media

a. Radio - types of programmes- writing for broadcast-scripting for drama feature, talks and discussions-news writing for radio-fixed programme chart preparation-scope of radio in podcasting-community and commercial FM broadcasting.

b. Television and film documentary-concept to story structure-narrative arc –script-screenplay and storyboard – production book and set design-difference between various media content- TV programmes- documentary and fiction.

Module 3: Advertisement

Various types of commercials- copywriting for print- radio and online advertisement- creative content filling- TV commercials.

Module 4: Writing For Digital Media

Digital reporting-writing for websites-blogging and vlogging script- news gathering and online stylistics- laws and ethics of new media-.cyber laws



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Gender Studies

HIS4 B05- Gender Studies

Module I: Key Terminologies and Concepts

Conceptualising Gender; define gender and sex- sexuality and sexism- gender as social construction- concept of masculinity and femininity-gender discrimination

Patriarchy and Matriarchy; concept and practice, Gerda Lerner., The Creation of patriarchy

Origin and concept of feminism; black feminism-dalit feminism-eco feminism

Essential readings

Jane Pilcher and Imelda Whelehan. Fifty, Key Concepts in Gender Studies

Judith Butler. Gender Trouble: Feminism and Subversion of Identity

Kamla Bhasin. What is Patriarchy?

Gerda Lerner. Creation of Patriarchy

References

Ruth Vanita and Saleem Kidwai (eds.). Same Sex Love in India: Readings in History and Literature

Sushila Agarwal. Status of Women

Uma Chakravarti. Gendering Caste through a Feminist Lens

Vandana Shiva. The Violence of Green Revolution

Leela Dube. Anthropological Explorations in Gender

Kamla Bhasin. Understanding Gender

Simon de Bouver. The Second Sex

Luce Irigaray. This Sex Which is Not One



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module II: Indian Society through Gender Perspective

Division of labour in pre- proto historic period- women in agriculture- involvement in technology and tool making-women images and ideas in Indus seals and crafts

Gender order in Brahmanical patriarchy- Uma Chakravarty- women in Buddhism and Jainism

Medieval Islamic law and women- rights of women in marriage and inheritance- women in royal courts- life in Mugal harem- cuncubinage- marginalised women- slave girls

British rule of law and women- Colonialism and discussion of women question

Essential Readings

Kunkum Roy (eds.). Women in Early Indian Societies: Readings in Early Indian History

Thomas. P. Indian Women through the Ages

Uma Chakravarti. Gendering Caste through a Feminist Lens

Gayatri Chakravorty Spivak. Can subaltern speak?

References

A.S. Altekar, The Position of Women in Hindu Civilization.

Thomas. P, Indian Women through the Ages.

Kiran Pawar, Women in India History: Vision and Venture

MadhuVij, et al. Women Studies in India, A journey of 25 Years

Sushila Agarwal. Status of Women

Vandana Siva. Staying Alive

Uma Chakravarti. Everyday Lives, Everyday Histories: Beyond the Kings and Brahmanasof ‘Ancient India’

Module III: Social, labour, educational and health issues of women at present



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Changing concept of family and marriage- labour and health issues- participation of women in politics- women literacy

Law Relating to Crimes against Women and transgender (study main features only)

Indian Penal Code -1860, 1983

Dowry Prohibition Act,1961

Protection of Women from Domestic Violence Act, 2005

Indecent Representation of Women [Prohibition]Act,1986

Essential readings

Nivedita Menon. Gender and Politics in India

Sushila Kaushik. Panchayati Raj in Action: Challenges to Women’s Role

Usha Sharma.Women Education in Modern India

Reshmi.G. and Anil Kumar K.S,Transgender, Charithram, Samskaram,Pradinidanam

A comprehensive Guide to Women’s Legal Rights for Indian Institute of Technology, IIT Kanpur

References

Indian Law related to Women and Children, Wikigender, www.wikigender.org

www.legalservicesindia.com

www.ncw.nic.in

https://wcd.nic.in

Law Relating to Women, https://shodganga.inflibnet.ac.in

Module IV: Contemporary Issues (short answer only)

Gender Identity- Heterosexuality- Queer Theory-Third Gender – Cross Dressers- problems of sexual minorities- Coming Out- MIX- Organizations of Sexual Minorities; Queerala- Queerythm-SGMFK.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Indian History- 4 The Making of Contemporary India

HIS6 B08-Indian History- 4 The Making of Contemporary India

Module I: Laying the Foundation of Modern India

♥ Partition and challenges; integration of princely states- strategies of Sardar Vallabhai Patel

♥ Framing of constitution; BR Ambedkar- significant features of Indian constitution- Preamble- Fundamental Rights and Duties- Directive Principles- nationality and citizenship

♥ linguistic reorganisation of states- multi cultural system and the principle of unity in diversity

Essential Readings

Durga Das Basu, Introduction to the Constitution of India

Bipan Chandra, Essays on Contemporary India

Bipan Chandra, Mridula Mukerjee and Aditya Mukerjee, India since Independence

Bipan Chandra. et. al (ed.), India After Independence

References

Gyanendra Pandey, Remembering Partition

Ramachandra Guha, India After Gandhi: The History of the World's Largest

Democracy

Francis R Frankel, India's Political Economy, 1947-77

Joya Chatterji, The Spoils of Partition: Bengal and India, 1947-67

Granville Austin, Indian Constitution: Cornerstone of a Nation

Nonica Dutta, Violence. Martyrdom and Partition: A Daughters Testimony

Module II: Nation Building

♥ Nehruvian era; Development and reconstruction- focus on technology-economic planning- mixed economy-industrialisation-land reform measures-Green Revolution



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

♥ Growth of parliamentary democracy

♥ Indian foreign policy in the era of cold war; NAM and Panchsheel-India Pakistan

Relations- Kashmir conflict- border disputes- relation with China

Essential Readings

Bipan Chandra, Essays on Contemporary India

Appadurai, Domestic Roots of India's Foreign Policy 1947-1972

References

S.Gopal, Jawaharla Nehru. A Biography, vol. 2, 1947-1956

S.Gopal, Jawaharlal Nehru. A Biography, vol. 3, 1956- 1964

Amartya Sen, Argumentative India

Module III: Pattern of Indian Development- Post-Nehruvian Era

♥ Reforms of Indira Gandhi; Nationalisation- Growth of public sector- Morarji Desai and

Demonetisation

♥ Reforms of Rajiv Gandhi; New Education Policy

♥ Changes after 1990; New economic reforms- Liberalization, Privatization, Globalization

(LPG)- Responses to new reforms

♥ Employment Generation Programmes; MGNREGP

Essential Readings

Bipan Chandra, Mridula Mukerjee and Aditya Mukerjee, India Since Independence

Bipan Chandra, et al (ed.) India After Independence

Ramanuj Ganguli, Globalisation in India: New Frontiers and Emerging Challenges

Rama Chandra Guha, India after Gandhi

References

TT Ram Mohan, Privitisation in India: Challenging the Economic Orthodoxy

Joseph Stiglitz, Globalization and Its Discontents



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Amartya Sen, Argumentative India

Naomi Klein, No Logo: No Space, No Choice, No Jobs

Module IV: New challenges and responses

♥ Internal squabbles and declaration of Emergency in India

♥ Nexalite movements ; general trends

♥ Regionalism and militant activities; Kashmir, Punjab and Assam

♥ Revival of caste politics; VP Singh and Mandal Commission

♥ Communalism and violence; The Delhi riots- Babri issue-Gujarat Carnage

♥ Development and ecology; Water disputes- social and environmental consciousness- Chipko movement- Narmada Bachavon Andolan

♥ Dalit movements and Tribal movements (Issue based discussion)

♥ Issues of human rights- RTI- Food Safety Bill- Right to education –Mass Media and Social Media

Essential Readings

Paul R Brass. The Politics of India since Independence

Bipan Chandra. In the Name of Democracy: JP Movement and the Emergency

KN Panikkar. Communal Threat, Secular Challenge

References

Mushirul Hasan. In Search of Identity: Indian Muslims Since Independence

Christopher Jafferlot . The Hindu Nationalist Movement in Indian Politics

KN Panikkar. Before the Night Falls:Forebodings of Fascism in India

KN Panikkar. The Concerned India’s Guide to Communalism

Gail Omvedt. Dalit Visions

Ramachandra Guha. The Unquiet Woods: Ecological Change and Peasant Resistance in

Himalaya

Ramachandra Guha and Madhav Gadgil. This Fissured Land

Vandana Shiva. Staying Alive. Women, Ecology and Survival in India

Vandana Shiva. The Violence of Green Revolution

Uma Chakravarti and Nanditha Haskar. The Delhi Riots. Three Days in the Life of a Nation



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P Sainath. Everybody Loves a Good Drought: Stories from India’s Poorest

Districts

Ashis Nandy et.al. Creating a Nationality: Ramajanamabumi Movement and the Fear of

The self

Amartya Sen. The Argumentative Indian: Writing on Indian History, Culture and Identity

Essential Readings

Rama Chandra Guha. India after Gandhi

Shashi Tharoor. India from Midnight to the Millennium



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Development of Economic Thought

ECO6B13 Development of Economic Thought

Module I: Mercantilism & Physiocrats

Mercantilism-Main characteristics - Limitations of national resources. Importance of Foreign Conquest, Colonization and Trade, Role of State in Foreign Trade, Definition of Wealth and the ways in which to augment it, Importance of the Balance of Trade, Works of Francis Bacon, Thomas Mum, Josiah Child, John Cary, Charles Davenant, John Stuart Mill Age of Enlightenment – France, Italy, Scotland. The Physiocratic school. Definition of surplus. The organization of economic activities and transactions. The Tableau Economique Works of Jacques Turgot, Francois Quesnay, Richard Cantillon.

Module II: British Political Economy

Nature of the Surplus, Source of Value, Measure of Value, Market Prices and Natural Prices, Profits and Wages, Gross and Net Revenue (national income), Income Distribution, Works of Adam Smith, David Ricardo, Robert Malthus, Objections raised by J. B. Say, Charles Dupuit, W Stanley Jevons, and Leon Walras, J.M. Keynes

Module III: Socialism

Rise of Socialist ideas, Political background, Ricardian Theory of Rent, Nationalization of Land, French Socialists, Marxism, Marx's writings in theoretical economics. The Marxian twist, Marxism post – 1991 - Schumpeter's Critique

Module IV: Indian Economic Thought

Early Indian economic thought - Chanakya's Arthashastra - Colonial Economic policies, Unfair treatment of the colonies, Nationalist response, Swadeshi Movement. Economic ideas of M. G. Ranade, Dadabhai Naorojee, Gopal Krishna Gokhale, Dr. B. R. Ambedkar, M.K. Gandhi

References:

1. Loganathan. V A, A History of Economic Thought, S Chand & Company, New Delhi (1987)
2. Srivastava S K - History of Economic Thought S Chand & Company, New Delhi (2002)
3. Ganguly B.N - Indian Economic Thought, A Nineteenth Century Perspective, McGraw Hill (1977)
4. Grid and Rist, A History of Economic Doctrines, George Harrop, London (1956)
5. Louis Haney - History of Economic Thought, Surjit Publications, New Delhi (1977)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Ernesto Screpanti and Stefano Zamagni, An Outline of History of Economic Thought, Oxford University Press, Second Edition (2005)
- Grey and Thomson, The Development of Economic Doctrine, Longman Group, London (1980)

Economics Of Growth and Development

ECO6B14 Economics of Growth and Development

Module I: Development and Underdevelopment- An Overview

Background and beginning of 'Development Economics' in the post-world war era, its elements Defining economic development - Alternative measures of development –PQLI, HDI and its extensions, Development and growth- income as a measure of growth - Human development-Sens capability approach, development as freedom, Structural features of underdeveloped economies-International variations – development gap- Underdevelopment as a low level equilibrium in a multiple equilibrium situation – low level equilibrium trap

Module II: Perceptions about Development and Underdevelopment

Vicious circle of poverty- Rostow's stages of growth-big push, balanced and unbalanced growth, Low level equilibrium models, Critical Minimum effort thesis- Dual economy models- Lewis model and its extensions, Harris- Todaro migration model - **Poverty and Inequality: Definitions, Measures and Mechanisms - Concept of poverty and its measures - Inequality meaning – axioms - commonly used inequality measures, Kuznets curve - Impact of poverty and inequality on process of development.**

Module III: Facts about economic growth

Neoclassical growth model- Solow model of growth- Production function, investment function, capital accumulation and steady state. Dynamics of the model-change in saving rate, population growth, Technological progress. Convergence in the Solow model. Endogenous growth theory- AK model.

Module IV: Development and environment.

Sustainable development. The environmental Kuznets curve. Global warming. Limits to growth- Earth summit.

References:



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Charles I Jones & Dietrich Vollreth (2013) – Introduction to economic growth, 3rd edition. W W Norton & Co
2. David N Weil (2012) – Economic growth, 3rd edition, Pearson.
3. A P Thirlwall (2011) – Economics of Development, 9th edition, Palgrave.
4. Todaro & Smith (2017) – Economic Development, 12th edition. Pearson.
5. Subrata Ghatak (2003) – Introduction to development economics, 4th edition, Routledge.
6. Debraj Ray (1999) – Development economics, 1st edition, OUP.
7. Hendrik Van Den Berg (2016) - Economic growth and development, 3rd edition. World scientific publishing Co.
8. E Wayne Nafziger (2005) – Economic Development, 4th edition, Cambridge University Press.

Urban Economics

ECO6B18 Urban Economics

Module I:

Definition and Scope of Urban Economics -The Process of Urbanization-Definition of Urban Area-causes of urbanization- Models of Urban Development and Planning- The Urban Economy and Development Strategy - The Economics of Urban Growth - Models of Urban Growth - The Frontiers of Urban Growth -The Economics of Intra-urban Location Decisions- Residential and industrial locations - Semi urban areas- special townships-Features of Urbanization in Developing Countries.

Module II:

Urban local Government- Types of local bodies and Governance- Cantonment Boards- Special Areas Improvement Trust: Functions, Problems and limitations- Slums Areas: Locations and Problems - slum development policy- Urban Poverty: Problems, Measures, and Policies- the Nature of Urban Poverty - The Causes of Poverty- Urban Crime and management

Module III:

Urban labour markets –Developed and developing economies –Informal sector –Segmentation and hierarchy –Dualism –Impact of globalization. – Urbanization without labour absorption in India.

Module IV:

Urbanization in India –Growth of Urban Population- Urban Development Policy in India Policies and Programmes under the Plans-Jawaharlal Nehru National Urban Renewal Mission (JNNURM).



CRITERION	I	Curricular Aspects
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References

1. O'Sullivan, A. (2002) Urban Economics, McGraw-Hill Irwin.
2. Fred Durr, The Urban Economy (London, Index Educational Publishers) 1971.
3. Todaro Michael P Internal Migration in Developing Countries a review of Theory evidence methodology & research priorities, ILO Geneva
4. Shukla, V. (1996) Urbanization and Economic Growth, Himalaya Publishers
5. Bidyut Mohanty (1993) Urbanization in Developing Countries Basic Services and Community Participation, Institute of Social Science, Concept Publishing House
6. Briance A and Ravinder Singh, (edited) (1995) Housing the Urban Poor, Policy and Practice in Developing Countries, Sage Publications (New Delhi).
8. Hartwick, John M. (2015) Urban Economics, Routledge; 1st edition.
9. Button, K. J. (1976) Urban Economics Theory and Policy, Palgrave Macmillan UK.
10. Rakesh A Mohan (1978) Urban Economic and Planning Models Assessing the Potential for Cities in Developing Countries, OCP- 25, World Bank.
11. Duranton, G. (2007). Urban Evolutions: The Fast, the Slow, and the Still. American Economic Review, 97 (1), 197-221. <http://dx.doi.org/10.1257/aer.97.1.197>.
12. Black, Duncan and Henderson, Vernon (1999), A Theory of Urban Growth, Journal of Political Economy, 1999, vol. 107, no. 2, The University of Chicago.
13. Handbook of Urban Statistics 2019 ,Ministry of Housing and Urban Affairs, Government of India

Financial Economics

ECO6B11 Financial Economics

Module I: Investment Theory and Structure of Interest rates

Introduction to financial economics, Time Value of Money: Future Value, Present Value, Future value of an annuity, Present value of annuity, Present rate of perpetuity.



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Investment Criteria: Net Present Value, Benefit Cost Ratio, Internal Rate of Return, Modified Internal Rate of Return.

Module II: Valuation of Bonds and Securities

Fundamentals of Valuation of Securities: Valuation of Bonds and Stocks; Bond Yield, Yield to Maturity. Equity Valuation: Dividend Discount Model, The P/E Ratio Approach; Irrelevance of Dividends: Modigliani and Miller Hypothesis.

Module III: Risk and Return

Types of risk, Historical returns and Risk, computing historical returns, average annual returns, variance of returns, Measurement of Risk and Return of an asset, Measurement of Risk and Return of a Portfolio, Determinants of Beta, Risk-Return trade off.

Module IV: Cost of Capital and Capital Asset Pricing Model

The Cost of Capital: Debt and equity; Cost of Debt, Cost of Preference Capital and Equity Capital. The capital market line; the capital asset pricing model; the beta of an asset and of a portfolio; security market line; use of the CAPM model in investment analysis and as a pricing formula.

Module V: Derivative Markets

An introduction to financial derivatives: Types and uses of derivatives; Forward Contracts: determination of forward prices, Futures Contract: theories of future prices- the cost of carry model, the expectation model, capital asset pricing model. Relation between Spot and Future Prices, forward vs future contract, Hedging in Futures; Options: types, value of an option, the Pay-Offs from Buying and Selling of Options; the Put Call Parity Theorem; Binomial option pricing model (BOPM) and Black-Scholes option pricing model.

References

1. L. M. Bhole and J. Mahukud, *Financial Institutions and Markets*, Tata McGraw Hill, 5th edition, 2011.
2. Hull, John C., *Options, Futures and Other Derivatives*, Pearson Education, 6th edition, 2005.

Additional Reading List

1. David G. Luenberger, *Investment Science*, Oxford University Press, USA, 1997.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2. Thomas E. Copeland, J. Fred Weston and KuldeepShastri, *Financial Theory and Corporate Policy*, Prentice Hall, 4th edition, 2003.
3. Richard A. Brealey and Stewart C. Myers, *Principles of Corporate Finance*, McGraw- Hill, 7th edition, 2002.
4. Stephen A. Ross, Randolph W. Westerfield and Bradford D. Jordan, *Fundamentals of Corporate Finance*. McGraw-Hill, 7th edition, 2005.

Agricultural Economics

CC19PECO4 E06- Agricultural Economics

Module I: Agriculture in Economic Development

Nature and scope of agricultural economics- Agriculture and economic development, Models of agricultural development (Schultz, Lewis, Fei & Ranis, Jorgenson, Todaro, Mellor, and Boserup) - Interdependence between agriculture and industry- Terms of trade between agriculture and industry.

Module II: Economic Decisions in Agriculture

Production- Factor-product relationship - Production functions- Cobb Douglas, CES & Spillman- Factor-factor relationship- Product-product relationship- Resource-use efficiency- Farm-size productivity debate- Capital formation in agriculture- Public versus private investment- Complimentarily versus substitutability debate- Classification of costs- Farm planning and farm budgeting- Systems of farm organization.

Module III: Behaviour of Demand, Supply and Agricultural Prices

Price determination of agricultural commodities-Elasticity of demand and supply of agricultural commodities- Cob-web theorem- Nerlovian supply response model-Prices instability- Role of public intervention in price determination and distribution of agricultural commodities- Agricultural price policy in India- Instruments of price policy- Crop insurance- CACP- Output subsidy- PDS- Food inflation.

Module IV: Agricultural Marketing

Agribusiness- Market structure of agricultural commodities- Marketed and marketable surplus- Distress sales- Defects of markets- Regulated markets- Co-operative markets- Market intelligence- Futures trading.

Module V: Structural and Institutional Changes in Indian Agriculture



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Area, production & productivity trends- Changing cropping pattern- Factors affecting cropping pattern- Agricultural development under five year plans- Green revolution- Agricultural inputs- HYV seeds- Farm mechanization- Fertilizer use efficiency- Crop irrigation technology- Input subsidies- Second green revolution- Ever green revolution- ICAR-Land reforms- Institutional and non-institutional sources of agricultural credit- NABARD- Co-operative credit, Rural indebtedness- Agricultural labour and wages- National Agricultural Policy 2000- National Commission on Farmers- WTO and Indian agriculture- DOHA Agreement.

References

1. Drummond and Goodwin: Agricultural Economics- Pearson, New Delhi, Ed.2, 2004.
2. Christopher Ritson: Agricultural Economics- Gosby Lockwood Staples, London, 1977.
3. Mellor J.W: The Economics of Agriculture Development- Vora & Co Bombay.
4. Bishop C.E. & Toussiant W.D: Introduction to Agricultural Economic Analysis- John Wiley & Sons, New York, 1958.
5. Heady E.O: Economics of Agricultural Production and Resource Use- Prentice Hall, N Y, 1961.
6. Hanumantha Rao C.H: Agricultural Production Function, Costs and Returns in India- Tata McGraw Hill 1965.
7. Joshi P.C: Land Reforms in India: Trends and Prospects- Allied Publishers, New Delhi, 1975.
8. Majumdar N A and Kapila Uma: Indian Agriculture in the New Millennium- Changing Perspective and Development Policy- Vol. I & II, Academic Foundation, New Delhi, 2006.
9. Mohammed, Munir, Rehman (Ed): Fifty Years of Indian Agriculture- Concept, New Delhi, 2007.
10. Vyas V Y: India's Agriculture Structure, Economic Policies and Sustainable Development- Academic Foundation, New Delhi, 2003.
11. C A Robertson: Introduction to Agricultural Production Economics and Farm Management.
12. Kapila Uma: Indian Economy- Academic Foundation, New Delhi, 2005.
13. Karl Eicher & Lawrence Witt: Agriculture in Economic Development- Vora & Co., Bombay, 1970.
14. Soni R N: Leading Issues in Agricultural Economics- Shoban Lal Nagin Chand, Jalandar, 1998.
15. Singh & Sadhu: Agricultural Problems in India- Himalaya, Bombay, 1986.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

16. S. Ghatak. & K. Ingersent: Agriculture and Economic Development- New Delhi. Select Book Service Syndicate.
17. Shultz T.W: Transforming Traditional Agriculture- New Haven, London Yale University Press 1965.
18. Vaidyanathan A (2010): Agricultural Growth in India: The Role of Technology, Incentives and Institutions- Oxford University Press, New Delhi.
19. C. H. Hanumantha Rao (2005): Agriculture, Food Security, Poverty and Environment: Essays on Post-reform India- Oxford University Press, New Delhi.
20. Subba Reddy, P. Raghu Ram, T. V. Neelakanta Sastry and I. Bhavani Devi (2004): Agricultural Economics- Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
21. Bhalla G.S (2007): Indian Agriculture Since Independence- National Book Trust, New Delhi.

Quantitative Methods for Economic Analysis

SCC19PECO1 C04 - Quantitative Methods for Economic Analysis

Module I: Linear Algebra

Different types of functions and its graphs, Constant Linear, Quadratic, Cubic, Polynomial, Exponential and logarithmic functions. Applications of linear functions in Economics- Vectors and Matrices, determinants, solution of a system of equations - Inverse method and Cramer's rule- Rank of a matrix-characteristic equations and characteristic roots and vectors.

Module II: Differential Calculus

Functions, limit of a function, continuity of a function, Derivative of a function - Rules of Differentiation, Higher order derivatives, differentiation of logarithmic functions, exponential functions and implicit functions- Application of Derivatives- Meaning of a Derivative- rate of change- slope of a curve- Marginal concepts related to demand, supply, cost, revenue and production functions. Maxima and minima- Economic applications.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module III: Functions of Several Variables

Functions of several variables - Partial differentiation- Optimisation of Multivariable functions- constrained optimization with Lagrangian multipliers-Consumers and producers equilibrium using constrained optimization Differentials- Total and Partial derivatives- Total derivatives- Rules of integration- Definite integral, area under a curve-estimation of producers and consumers surplus.

Module IV: Differential and Difference Equations

First order Differential equations -Definitions and concepts, general formula for Differential equations – Economic applications-Differential equations for limited and unlimited growth - First order Difference equations- Solution of first order difference equations - General formula for First order Linear Difference equations, applications - stability conditions, Cobb Web model.

Module V: Financial Mathematics

Arithmetic and geometric sequence and series- Simple interest, compound interest and annual percentage rates- Depreciation- Net present value and internal rate of return- Annuities, debt repayments, sinking funds- The relationship between interest rates and the price of bonds.

References

1. Essential Mathematics for Economics and Business, Teresa Bradley and Paul Patton, Revised by Teresa Bradley, Wiley Student Edition Chapter- 2 and Chapter-4.
2. Introduction to Mathematical Economics Edward T. Dowling Third Edition Chapter-8.
3. Taro Yamane: Statistics - An Introductory Analysis, Harper & Row, Edition 3.
4. Hoel PG: Introduction to Mathematical Statistics, John Wiley & Sons, Edition.
5. RGD Allen Mathematical Analysis for Economics.
6. Tulsian, P.C and Vishal Pandey: Quantitative Techniques, Pearson Education, New Delhi.
7. S.P. Gupta: Statistical Methods, Sultan Chand and Sons, New Delhi.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

8. Hooda R.P. Statistics for Business and Economics, Macmillan, New Delhi.
9. Alpha C Chiang: Fundamental Methods of Mathematical Economics, 2nd Ed. Inter National Student Edition, Mc Grawhill.
10. Edward T Dowling: Introduction to Mathematical Economics, Third Edition, Schaum's Outlines, Tata Mc Grawhill Publishing Co. Ltd, New Delhi.
11. Sreenath Baruah: Basic Mathematics and its Applications in Economics, Macmillan India Ltd.
12. Joseph K.X, Quantitative Techniques, CUCCS Ltd, Calicut University.

Quantitative Methods for Economic Analysis 11

CC19PECO2 C08 - Quantitative Methods For Economic Analysis 11

Module I: Probability and Probability Distributions

Concepts- Set theory- Permutations and Combinations, Definitions of Probability - classical, empirical and axiomatic approaches- Addition and multiplication laws, conditional probability- Bay's theorem, Random variables- probability distribution- Mathematical expectation- moments- Two random variables, joint, Marginal and conditional probability functions, expectation of two random variables.

Module II: Discrete and Continuous Probability Distribution

Probability Distributions - Discrete Probability Distributions, Binomial, Poisson, Uniform - simple applications- Continuous probability distributions- Normal, Lognormal and Exponential Distributions (Derivations are not expected), concept of law of large numbers and Central limit theorem.

Module III: Theory of Estimation



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Statistical Inference, Concept of population, sample- Sampling distributions-

Standard error- Distributions of sample mean, Sample variance - chi square Student's t, and F distributions-

Small and large sample properties of Z, t, Chi Square and F- Estimations of populations parameters- point and interval estimation- Fisher's properties of estimators-Confidence interval for Mean and Proportion and variance- Methods of estimation-Methods of least squares, Method of maximum likelihood.

Module IV: Testing of Hypothesis

Parametric and Non-parametric tests of Hypothesis - Testing of hypothesis- simple and composite hypothesis- Null and alternative hypothesis- Type I and Type II error, Critical region- Level of significance, Power of a test- Test procedure - Test of significance in respect of Mean, Proportion, Variance and Correlation coefficient and their differences -Chi Square test of goodness of fit, and test for independence of attributes. Non parametric tests, sign test, Wilcoxon- Mann Whitney U Test, Signed rank test, Kruskal Wallis test, Wald-Wolfowitz test

Module V: Analysis of Variance

Analysis of Variance- Meaning, assumptions-One way classification and Two way classifications, simple applications.

References

1. Taro Yamane, Statistics: An Introductory Analysis, Harper & Row, Edition 3, 1973
2. Hoel PG: Introduction to Mathematical Statistics, John Wiley & Sons, Edition 4, 1971



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. YP Agarwal: Statistical Methods: Concepts, Application and Computation, Sterling Publishers 1986
4. Sidney Siegal, N. John Castellan: Non parametric Statistics for Behaviour Sciences, Edition 2, 1988, Mc Graw-Hill
5. Tulsian, P.C and Vishal Pandey: Quantitative Techniques, Pearson Education, New Delhi
6. S.P. Gupta: Statistical Methods, Sulthan Chand and Sons, New Delhi.
7. Hooda R.P: Statistics for Business and Economics , Mac Million, New Delhi
8. Alpha C Chiang: Fundamental Methods of Mathematical Economics, 2nd Ed. -Inter National Student Edition, Mc Grawhill
9. Edward T Dowling: Introduction to Mathematical Economics, Third Edition, Shaum’s Outlines, Tata Mc Grawhill Publishing Co. Ltd, New Delhi.
10. Sreenath Baruah: Basic Mathematics and its applications in Economics, Macmillan India Ltd.
11. Joseph K.X, Quantitative Techniques, CUCCS Ltd, Calicut University.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Phycology, Bryology, Pteridology And gymnosperms

BO1C01 Phycology, Bryology, Pteridology and Gymnosperms

Phycology

1. Classification of Algae-comparative Survey of important systems - Fritsch-Smith-Round. Criteria for algal classification-Phylogenetic considerations.
2. **Biological importance of Planktons.**
3. Algal cytology-Basic ideas of cell features-Electron microscopic studies of algal cell, cell wall, flagella, chloroplast, pyrenoid, eyespot- their importance in classification.
4. Reproduction-Different types of life cycles in algae.
5. General account of energy sources and pigments in algae.
6. **Economic importance of algae-Role of algae in soil fertility, algae in industry-Biological importance of phytoplanktons and water blooms.**
7. **General account of thallus structure, cell ultra-structure, reproduction, relationships and evolutionary trends in the following' groups: Chlorophyta, Xanthophyta, Bacillariophyta, Phaeophyta, Rhodophyta.**

References

1. Fritsch, F.E. The structure and Reproduction of Algae.
2. Smith, G.M. Manual of Phycology
3. Round, F.E, The Biology of Algae.
4. Pold and Wyane. Introduction of Algae.

Bryology

1. General characters and systems of classifications of Bryophytes



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. General account of the anatomy, reproduction, life history and phylogeny of Sphaerocarpaceae, Marchantiales, Jungermanniales, Calobryales, Anthocerotales, Sphagnales, Andreales, Funariales and Polytrichales
2. Origin and evolution of Bryophytes- gametophytic and sporophytic.
3. A general account of fossil Bryophytes and their affinities.
4. Economic importance of Bryophytes.

References

1. Watson E.V. The structure and life of Bryophytes. Hutchinson Univ. Press, London.
2. Cavers F. The interrelationship of Bryophytes. New Phytologist.
3. Kashyap S. R., The Liverworts of Western Himalaya and the Punjab Plains, Vol. I & II. Chronica Botanica
4. Smith G. M. Cryptogamic Botany. McGraw Hill Book Co., N.Y.
5. Parihar N. S. An introduction of Embryophyta: Bryophyta. General Book House, Allahabad.
6. Verdoon, F. M. Manual of Bryology. Ashor & Co., Amsterdam.
7. Shaw, J. and Goffinet, B. Bryophyte Biology. Cambridge University Press.
8. Manju C. Nair, K.P. Rajesh and Madhusoodanan P.V. Bryophytes of Wayanad in Western Ghats. Malabar Natural History Society, Kozhikode.

Pteridology

1. General characters and life history of Pteridophytes.
2. Cytology of Pteridophytes- Chromosome number and polyploidy.
3. Structure and evolution of stele in Pteridophytes.
4. Origin and evolution of Sporangium.
5. Heterospory and seed habit.



CRITERION	I	Curricular Aspects
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6. Development and evolutionary trends in the Gametophytes of Pteridophytes.
7. Apogamy, Apospory and Parthenogenesis.
8. Classification of Pteridophytes: Holttum, Pichi-Sermolli.
9. Comparative morphology, ecology and phylogeny of the following:
 - a. Psilopsida : Rhyniales, Psilophytales and Psilotales
 - b. Lycopsidea: Lycopodiales and Isoetales
 - c. Sphenopsida: Hyeniales, Pseudoborniales, Sphenophyllales, Calamitales and Equisetales.
 - d. Filicopsida: General account: Primofilicales, Ophioglossales, Marattiales, Osmundales, Schizaeales, Cyatheaales, Gleicheniales, Marsileales and Salviniiales.
10. Economic importance of Pteridophytes-Medicinal, Horticulture, Biofertilizer, weeds.
11. General account of the contribution of Indian pteridologists.

References

1. Bierhost, D.W. Morphology of Vascular Plants. Mac Miilan Co., New York.
2. Dyer, A.C. The Experimental Biology of Ferns. Academic Press, London.
3. Jermy, A.C. (Ed.): The phylogeny and Classification of Ferns.
4. Kramer, K.U. and Green, P.S. The Families and Genera of Vascular Plants. Narosa, New Delhi.
5. Nampy, S. and Madhusoodanan, P.V. Fern Flora of South India-Taxonomic Revision of Polypodioid Ferns. Daya Publishing House, New Delhi.
6. Abdul Hameed C., Rajesh K.P. and Madhusoodanan P.V. Filmy Ferns of South India. Penta Book Publishers & Distributors, Calicut.
7. Azeez K., Venugopalakrishna Kurup V. and P.V. Madhusoodanan. Spleenworts (Aspleniaceae) of South India. Malabar Natural History Society, Calicut.
8. Venugopalakrishna Kurup V., Azeez K. and P.V. Madhusoodanan. Primitive Ferns of South India. 'V'Publishers, Kottayam.



CRITERION	I	Curricular Aspects
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Gymnosperms

- Geological time scale and correlated predominant Gymnosperm flora. Classification of Gymnosperms- Chamberlain's system.
- Geological horizons. Distribution, morphology, anatomy, reproduction and interrelationship of the following orders (Study of families and types not required)
 - Pteridospermales; b. Glossopteridales; c. Caytoniales; d. Cycadaeoidales; e. Pentoxylales; f. Cycadales, g. Ginkgoales; h. Cordaitales; i. Coniferales; j. Taxales; k. Ephedrales; l. Welwitschiales; m. Gnetales
- Phylogenetic relationship of Gymnosperms.
- Economic importance of Gymnosperms
-

References

- Andrews, H.N. Studies in Paleobotany, Wiley, N.Y.
- Banks, H.P. Evolution and plants of the past. Wadsworth.
- Bierhost, D.W. Morphology of Vascular Plants. Macmillan.
- Bower, F.O. Primitive Plants. Macmillan.
- Chamberlain, C.J. Gymnosperms- Structure and Evolution. Univ. of Chicago Press.
- Foster, A.S. & E.M. Gifford. Comparative morphology of vascular plants. Freeman.
- Maheshwari, P & V. Vasil. Gnetum. CSIR, New Delhi.
- Ramanujam, C.G.K. Indian Gymnosperms in time and space. Today & Tomorrow, Dehra Dun.
- Sewart, W.N. Paleobotany and the Evolution of Plants. Cambridge Univ. Press.
- Stockey, R.S. Some comments on the origin and evolution of conifers. Canadian J. Bot. 59: 75-82
- Taylor, T.N. Reproductive biology in early seed plants. Bioscience 32:23-28.
- Walton. An Introduction to the Study of Fossil plants.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Mycology, Lichenology, Microbiology and Plant Pathology

BOT1C02 Mycology, Lichenology, Microbiology And Plant Pathology

Mycology

1. General characters of Fungi: cell-ultra structure, unicellular and multicellular organization, hyphal growth, cell wall composition, nutrition (saprobic, biotrophic, symbiotic, predacious) reproduction (vegetative, asexual, sexual), heterothallism, parasexuality.
2. Classification of fungi by Ainsworth & Bisby (1983), Alexopoulos et al. (1996)- Phylogeny of fungi- Characters used in classification.
3. **General account of Myxomycota, Mastigomycota, Zygomycota, Ascomycota, Basidiomycota and mitosporic fungi. Different kinds of spores and their dispersal.**
4. Fungi as saprophytes: details of the fungal decomposition of organic matter, coprophilous fungi, lignin degrading fungi, role of fungi in degradation of pesticides.
5. **Fungi as symbionts: Mycorrhiza – ectotrophic, orchidaceous and Ericoid mycorrhiza, Vesicular Arbuscular Mycorrhiza - their distribution and significance. Endophytes.**
6. **Lichenology: General account and systematics of lichens, thallus structure, reproductive bodies, ecological significance and economic importance of lichens.**

References

1. Alexopoulos C.J., Mims, C.W. & Blackwell, M. Introductory Mycology. 4th edition. John Wiley & Sons Inc.
2. Ainsworth, G.C., Sparrow, K.F.& Susmann, A.S.(Eds.). The Fungi - An Advanced Treatise. Vol 1-4. Academic Press.
3. Burnett, J.H. Fundamentals of Mycology. Edward Arnolds.
4. Cariile, M. J. & Watkinson S.C. The Fungi. Academic Press.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Deacon, J.W. Introduction to Modern Mycology. Blackwell.
- Dubey, H.C. An Introduction to Fungi. Vikas Publishers, New Delhi.
- Hale Mason, E. The Biology of Lichens. 3rd Ed. Edward Arnold, London.
- Jennings, D.H. & Lysek, G. Fungal Biology. Bios Scientific Publishers.
- Mehrotra, R.S. & Aneja, K.R. An Introduction to Mycology. New Age International Publishers.
- Landecker, Elizabeth Moore. Fundamentals of Fungi. 4th Ed. Prentice Hall.
- Nair, M.C. & Balakrishnan, S. Beneficial fungi and their utilization. Scientific Publishers, Jodhpur.
- Nash, T.H. Lichen Biology. Cambridge University Press.
- Webster, John. Introduction to Fungi. Cambridge University Press.

Microbiology

- Introduction - main groups of microorganisms and their characteristics -prions, viroids, viruses, bacteria, mycoplasmas and actinomycetes.
- Bacteria - classification based on Bergey's Manual. Archaeobacteria and Eubacteria. Morphology, ultra-structure, nutrition, genetics
- Plasmids and their characterization.
- Cyanobacteria- salient features, morphology, ultrastructure, classification and economic importance.
- Viruses- General account of plant and animal viruses, bacteriophages and their classification. Isolation, purification, infection, replication and transmission of plant viruses. Detailed study of TMV and T4Phage.
- Microbial ecology- microbiology of rhizosphere and phylloplane. Sewage disposal, bioremediation and water purification. Detection of microbes in air and water.
- Agricultural microbiology - management of agricultural soils, biofertilizers, biopesticides
- Food Microbiology - Food spoilage and preservation methods. Microbiology of fermented food - dairy products, bread and other fermented plant products. Microorganisms as source of food- single cell protein.



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9. **Industrial Microbiology - Production of alcohol, vinegar, antibiotics, vitamins, steroids, vaccines, organic acids, amino acids.**

References

1. Adams, M R & Moss, M.O. Food Microbiology. New Age International Publishing Ltd., New Delhi.
2. Brock, T. D. Biology of Microorganisms. Prentice Hall.
3. Campbell, R. Microbiology. ELBS-Edward Arnold, London.
4. Carpentier, P.L. Microbiology. W.B. Saunders & Company, Philadelphia.
5. Dubey, R.C. & Maheswari, D.K. A text book of Microbiology.
6. S. Chand. Desikachary. Cyanophyta- Monograph
7. Goodfellow, M. et.al. The Biology of Actinomyces. Academic press.
8. Kumar, H.D. & Swati Kumar. Modern Concepts of Microbiology.
9. Mathew, R.E.F. Plant Virology, Academic press.
10. Pelozar, M.J., Chan, E.C.S. & Krieg, N.R. Microbiology. Tata Mc Graw Hill.
11. Sharma, P.D. Microbiology & Plant Pathology. Rastogi Publishers, Meerut.

Plant Pathology

1. Principles of Plant Pathology- Causal agents of plant diseases - Biotic causes (fungi, bacteria, virus, mycoplasma, nematodes, angiospermic parasites. Abiotic causes (nutrient and mineral deficiencies, effect of pollution). Koch's postulates. Iatrogenic diseases. Seed pathology.
2. Details of different symptoms of plant diseases.
3. Process of infection- mechanical, physiological and enzymatic action. Penetration and entry of pathogens in to host tissue.



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- Host- parasite interaction. Enzymes and toxins in pathogenesis. Defense mechanisms in plants (structural and biochemical).
- Details of different ways of spread and transmission of plant diseases- wind and water-mediated, seed borne and vector borne.
- Plant disease management- exclusion, eradication and protection. Different pesticides and fungicides and their application. Biocides in plant protection.
- Study of the following diseases with reference to the symptoms, causal organisms, disease cycle and control measures:

Bunchy top of banana, Bacterial blight of paddy, Bud rot of coconut, Mahali of Arecanut, Powdery mildew of rubber, Abnormal leaf fall of rubber, tikka disease of Ground nut, Late blight of potato, Blister blight of tea, wheat rust, coffee rust, grey leaf spot of coconut, Phytophthora foot rot of pepper, rhizome rot of ginger and turmeric, angiospermic parasites-Viscum, Dendrophoe.

References

- Agrios, G.N. Plant pathology. 4th Ed., Academic Press.
- Bilgrami, K.H. & Dube, H C. A Text Book of Modern Plant Pathology. Vikas Publishers, New Delhi.
- Chaube, H.S. & Ramji Singh. Introductory Plant Pathology. International Book Distributing Co., Lucknow.
- Gareth-Jones, D. Plant Pathology: Principles and Practice. Open University Press.
- Horsfall J.G. & Cowling E. B. (Ed.). Plant Disease: An Advanced Treatise. Academic Press.
- Lucas, J. A. Plant Pathology and Plant pathogens. Blackwell.
- Manners, J.G. Principles of Plant Pathology. Cambridge Univ Press.
- Mehrotra, R.S. Plant Pathology. Tata Mc Graw Hill.
- Pandey, B. P. Plant Pathology -pathogen and plant disease. S. Chand & Co.
- Pathak, V.N., Khatri, N.K. & Pathak, M. Fundamentals of Plant Pathology. Agro-bios India.
- Rangaswami, G. Diseases of Crop Plants of India. Prentice Hall India.



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

12. Tarr, S.A. J. The Principles of Plant Pathology. Winchester Press.

13. Wheeler, H. Plant Pathogenesis. Springer Verlag.

14. Wood, R.K.S. Physiological Plant Pathology. Blackwell

Angiosperm Anatomy, Angiosperm Embryology, Palynology & Lab Techniques

BOT1C03 Angiosperm Anatomy, Angiosperm Embryology, Palynology & Lab Techniques

Angiosperm Anatomy

1. Cell wall and its development. Chemistry of cell wall- cellulose, hemicellulose, polysaccharides, cell wall proteins, water. Organization of primary wall. Cytokinesis and growth. Plasmodesmata. Secondary wall chemical constituents- lignin, suberin, callose; organization of secondary wall.
2. Node - nodal patterns: Unilacunar, trilacunar, multilacunar and split lateral. Phylogenetic considerations. Leaf trace and branch trace- origin, departure; effect on stele and pith. Secondary growth in leaf traces.
3. Cambium: Development of vascular cambium and cork cambium in root and stem; cell types in vascular cambium, infected vascular cambia, seasonal variations in cambial activity; role of cambium in wound healing and grafting. Conversion of fusiform initials in to ray initials; cambium in arborescent monocotyledons (Liliflorae).
4. Development and differentiation: The structure of specialized cells. Vascular differentiation (procambium, residual meristem, interfascicular and intrafascicular cambia); acropetal and basipetal differentiation in leaves, stem and roots. Sieve tube differentiation. Control of phloem differentiation. Tracheary elements differentiation. Ultra-structure of phloem and xylem, brief account of transfer cells. Secondary wall thickening, cytoplasmic changes and autolysis. Control of differentiation. Genetic aspects- induction of vessel elements. induction of secondary xylem structure in relation to function in water conduction.



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5. Anomalous secondary growth: Concepts; modification of the common type of vascular cambium, unequal activity of the vascular cambium. Successive cambia. Anomalous placement of vascular cambium. Discontinuous, unidirectional and bidirectional activity of cambium. Anomalous secondary growth in storage roots (Beet root, sweet potato).
6. Seedling anatomy: Concepts: anatomy of cotyledons, hypocotyl, seedling root, mesocotyl differentiation
7. Leaf anatomy: Unifacial, bifacial and centric leaf (onion); structure of epidermis, stomatal types; foriar
 1. sclerieds; oil cells; crystal idioblasts.
 2. Anatomy in relation to taxonomy.
 3. Wood anatomy- general account.

References

1. Easu, K. Plant Anatomy - Wiley Eastern Limited.
2. Fahn, A. Plant Anatomy. Pergamon Press.
3. Cutter, E.G. & Edward, E. Plant Anatomy: Experiment and Interpretations Part I and II.
4. Mauseth, J.D. Plant Anatomy - The Nenjamin Cumming Publishing Co.
5. Forester, A.S. Practical Plant Anatomy. D. Van Nostrand Company Inc.
6. Roberts, L.W. Cytodifferentiation in Plants - Cambridge University Press, Cambridge.

Angiosperm Embryology

1. Introduction to angiosperm embryology - structure of ditheous and monotheous anther.
2. Microsporogenesis: Structure and function of wall layers, role of tapetum in pollen development
3. Male gametophyte: Pollen mitosis, division of generative cells, heterospory.
4. Megasporogenesis: Megaspore triad, dyad, coenomegaspore.
5. Embryo sac- different types- ultra-structure of components- synergid and antipodal. Theories of the morphological nature of embryo sac



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6. Pollination -Artificial pollination - ultra-structural and dis-ultrastructural and histo-chemical sigma. Significance of pollen - pistil interaction. Role of pollen wall proteins and stigma. In vitro pollination and fertilization.
7. Fertilization: Role of synergids - filiform apparatus, heterospermy and triple fusion.
8. Structure and development of typical dicot and monocot embryos- structure and function of suspensor.
9. Endosperm: classification and type- ruminant endosperm- mosaic endosperm- endosperm haustoria- physiology and cytology of endosperm.
10. Polyembryony - classification – practical value.
11. Apomixis - general account, genetics of apomixis.
12. Parthenocarpy -seedless fruits
13. Experimental embryology-embryo culture, anther culture, ovule culture.
14. Embryology in relation to taxonomy.

References

1. Bouman F. Ovule initiation, ovule development and seed coat a structure in angiosperms. Today and Tomorrow Publishers, New Delhi.
1. Bhojwani S.S. and Bhatnagar S.S. The embryology of Angiosperms. Vikas Publication, New Delhi.
2. Davis C.L. Systematic embryology of Angiosperms. John Wiley.
3. Eames A.J. Morphology of Angiosperms. Mc Graw Hill.
4. Johanson D. Plant Embryology. Waltham, Massachusetts.
5. John B.D. (Ed.). Embryology of Angiosperms. Springer Verlag.
6. Maheswari P. An introduction to the Embryology of Angiosperms. Mc Graw Hill.
7. Raghavan V. Experimental embryogenesis in plants. Academic Press.
8. Wardlaw C.W. Embryogenesis in Plants. Methusen, London.

Palynology



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Introduction- contributions of Erdtman and P. K. K. Nair.
2. Development and structure of pollen wall. Pollen morphology and its application. Pollen evolution
3. Aero-palynology- methods of aerospore survey and analysis
4. Melittopalynology- nutritional and medical value of honey- unifloral and multifloral honey.
5. **Recent advances in palynological studies- forensic-pollen allergy-oil exploration-paleopalynology.**
6. Palynology in relation to taxonomy- eurpalynous and stenopalynous taxa.

References

1. Sripad N. Agashe. Palynology and its Application.
2. Kahinath Bhattacharya et. al. A Text Book of Palynology.

Laboratory Techniques

1. Study of the following instruments - their uses and principles:
 - a. Microscope: microscopic measurements - camera lucida, micrometry.
 - b. Microtomes- Sledge, Rocking, Rotary.
2. Killing, fixing and staining of plant tissues:
 - a. Important reagents and chemicals used in the preparation of fixatives and their properties.
 - b. Fixatives - FAA, Carnoy's fluid, chrome acetic, Nawaschins fluid, Craff, Flemings- composition, preparation and specific uses.
 - c. Dehydrating agents, clearing agents, mounting media. Examples and brief description.
 - d. Stains - classification, composition and specific uses - safranin, crystal violet, cotton blue, fast green, Orange - G, hematoxylin, carmine.
 - e. Brief account of vital staining.
 - f. Staining techniques - Double staining.
 - i. Safranin - Fast green
 - ii. Crystal violet – Orange G
 - iii. **Methods of embedding plant materials in paraffin wax - TBA method; embedding for Electron microscopy.**
 - ii. **Sectioning of embedded paraffin wax materials using Rotary Microtome.**
 - iii. **Double staining of microtome serial sections embedding in paraffin wax - Safranin - fast green; Crystal violet - Orange G / Erythrosin.**
 - iv. **Whole mounts - general account**
 - v. **Maceration, smears**



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

vi. Histochemical tests –

1. PAS Test - insoluble polysaccharides. (2) Sudan black -lipids. (3) Fuelgen reaction - Nucleic Acids.

References

1. Peter Gray. Hand book of Basic microtechnique. Mcgraw – Hill.
2. John E. Sass. Botanical Microtechnique, Oxford & IBH Publishing Co.
3. John R. Baker. Principles of Biological Microtechnique –
4. A guide book to microscopical methods. A. V. Grimstone and R.J. Saker, Cambridge Univ. press.
5. K.V. Krishnamurthy. Methods in Plant Histochemistry.

Practicals of Phycology, Bryology, Pteridology, Gymnosperms, Mycology & Lichenology

BOT1L01 – Practicals of Phycology, Bryology, Pteridology, Gymnosperms, Mycology & Lichenology

Phycology

1. Collection, preparation and submission of algal herbarium (5 numbers).
2. Collection and study of the types mentioned below and their identification up to generic level using algal monographs:

Chlorophyta: Pediastrum, Scenedesmus, Hydrodictyon, Ulva, Cladophora, Pithophora, Bulbochaeta, Cephaleuros, Draparnaldiopsis, Bryopsis, Codium, Caulerpa, Halimeda, Desmids (Closterium, Cosmarium), Nitella.

Xanthophyta: Botrydium.

Bacillariophyta: Biddulphia, Coscinodiscus, Cymbella.

Phaeophyta: Ectocarpus, Dictyota, Padina, Turbinaria.

Rhodophyta: Batrachospermum, Gracilaria, Champia.

Bryology

1. Morphological and structural study of representative members of the following groups using whole mount preparations, dissections and transactions:



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Asterella, Targionia, Cyathodium, Lunularia, Pallavicinia, Dumortiera, Porella, Anthoceros, Sphagnum and Bryum.

Pteridology

1. Collection, preparation and submission of five herbarium sheets of pteridophytes.
2. Study of vegetative and reproductive features of Lycopodium, Ophioglossum, Angiopteris, Osmunda, Lygodium, Ceratopteris, Pteris, Asplenium, Blechnum, Cyathea, Gleichenia, Trichomanes, Salvinia and Azolla.
3. Study of the following fossils: Rhynia, Lepidodendron, Sphenophyllum, Calamites, Calamostachys, Zygopteris and Anachoropteris.
4. Spore germination and development of prothallus in Knop's Agar medium.

Gymnosperms

1. Identification of petrifications, compressions, impressions: Lyginopteris, Heterangium, Medullosa, Trignocarpus, Glossopteris, Caytonia, Pentaxylon and Cordaites.
2. Study of vegetative and reproductive structures of Zamia, Ginkgo, Pinus, Cryptomeria, Cupressus, Araucaria, Agathis, Podocarpus, Cephalotaxus, Ephedra and Gnetum.

Mycology

1. Critical study of the following types with the help of fresh/preserved materials by making suitable micropreparations giving emphasis on systematic position, details of vegetative and reproductive structures: Stemonitis, Saprolegnia, Phytophthora, Albugo, Mucor, Pilobolus, Saccharomyces, Xylaria, Chaetomium, Peziza, Puccinia, Auricularia, Polyporus, Ganoderma, Lycoperdon, Dictyophora, Geastrum, Cyathus, Aspergillus, Curvularia, Alternaria, Fusarium, Colletotrichum, Parmelia, Usnea.

Practical records:

Submission of certified record of practicals at the time of terminal evaluation.

Field work:

2 days of field work for the in-situ study of the types of the above areas of study and submission of a field report.



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Practicals Of Microbiology, Plant Pathology, Angiosperm Taxonomy, Angiosperm Embryology, Palynology & Lab Techniques

BOT1L02 – Practical Of Microbiology, Plant Pathology, Angiosperm Taxonomy, Angiosperm Embryology, Palynology & Lab Techniques

Microbiology

1. Test for the presence of coliform bacteria in contaminated water.
2. Isolation of Eubacteria and Cyanobacteria from soil by dilution plate method.
3. Isolation of pure bacterial culture by streak plate method.
4. Staining of bacteria (negative staining, Gram staining and spore staining).
5. Demonstration of bacterial motility by hanging drop method.
6. Morphological studies on Scytonema, Aphanocapsa, Spirulina, Oscillatoria, Anabaena.

Plant Pathology

1. Submission of five herbarium sheets of pathological specimens.
2. Detailed lab study of the following diseases:
Bunchy top of banana, Bacterial blight of paddy, Bud rot of coconut, Mahali of Arecanut, Powdery mildew of rubber, Abnormal leaf fall of rubber, tikka disease of Ground nut, Late blight of potato, Blister blight of tea, wheat rust, coffee rust, grey leaf spot of coconut, Phytophthora foot rot of pepper, rhizome rot of ginger and turmeric, angiospermic parasites- Viscum and Dendrophoe.
3. Technique of isolation and pure culture of pathogens.

Angiosperm Anatomy

1. Study of anomalous secondary growth in roots and stems of Aristolochia, Strychnos, Amaranthaceae, Nyctaginaceae, Bignoniaceae and Agavaceae.
2. Nodal anatomy of different types.
3. Leaf anatomy: epidermal peels and TS of lamina.

Embryology

1. Study of anther development of Datura.
2. Preparation of dissected whole mounts of microsporangium.
3. Study of megaspore mother cell, megaspore and embryo sac.



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4. Study of the receptivity of stigma and in situ germination of pollen.
5. Dissection of stages in the development of embryo and endosperm.
6. Pollen germination using hanging drop technique.
7. Demonstration of intra ovarian pollination.

Palynology

1. Analysis of honey for microscopic examination of pollen.
2. Calculation of percentage of viable pollen by using T Z test.
3. Study of pollen wall by acetolysis.

Lab Techniques

1. Measurement of microscopic objects - Micrometry
2. Camera lucida drawing - calculation of magnification
3. Double stained permanent sections - free hand section, Microtome serial sections.
4. Preparation of whole mounts, macerations and smears.
5. Submission of 10 permanent slides - which should include microtome serial sections, free hand sections, macerations, whole mounts and smears.

Practical records:

Submission of certified record of practicals at the time of terminal evaluation.

Field work:

2 days of field work for the in-situ study of the types of the above areas of study and submission of a field report.

Cell Biology, Molecular Biology & Biophysics

BOT2C04 – Cell Biology, Molecular Biology & Biophysics

Cell Biology



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. The nucleus. Interphase nucleus- Chromatin organization- nucleosomes, scaffold. Organization of eukaryotic chromosome. Heterochromatin- constitutive, facultative and condensed. Euchromatin. Satellite DNA. Chromosome banding and its significance.
2. Cell reproduction: Cell cycle. Specific events G1, S, G2 and M phases. Significance of G₀. Control of cell cycle. Significance. Gene expression during cell cycle. Mitotic Inducers.
3. Meiosis: types, synaptonemal complex, significance of meiosis. Genetic control and consequences of meiosis. Restriction points and check points. Cell cycle regulation of meiotic events- behaviour of sex chromosomes in meiosis- suppression of DNA replication between Meiosis I and II. Meiotic defects and human diseases.
4. Programmed cell death- necessity, classes, signals. Genetic analysis of cell death. Proteins regulating apoptosis. Pathways leading to cell death- significance. Aging- cellular and extracellular. Cell signaling.
5. Cell interactions-communication, recognition and adhesion. Application.
6. Cellular differentiation and specialization. General characteristics, intrinsic interactions- Nucleo-cytoplasmic. Extrinsic interactions. Molecular mechanisms of cellular differentiations.
7. Cancer- carcinogenic agents. Phenotype of the transformed cell. Genetic basis of malignant transformation- oncogenes. Tumour suppressor genes. Cancer and cell cycle. Metastasis. Interaction of cancer cells with normal cells.

References

1. Cooper Jeffrey M. The Cell- A Molecular Approach. ASM, Washington.
2. Karp Gerald. Cell Biology. JohnWiley and Sons.
3. Derobertis. Cell and Molecular Biology.
4. Sadava R.
5. Pollard T.D. and Earn Shaw W.C. Cell Biology. Saunders.

Molecular Biology

1. Molecular biology of gene: Structure of DNA: Repetitive DNA; c-value paradox.
2. Replication of DNA: Enzymology of replication. Replication in prokaryotes and eukaryotes. Primosomes and replisomes. Telomerase and its function.
3. Gene expression: regulation of gene expression- Operon concept- Gene regulation in prokaryotes and eukaryotes- enhancers and silencers.
4. Protein synthesis: Transcription, post-transcriptional events. Infrons and their significance. Translation. Post translational events. Role of chaperons.
5. Mutation: Spontaneous and induced. Physical and chemical mutagens. Molecular mechanism of mutation. Mutation and cancer. Mutator and antimutator genes. DNA repairing mechanisms.
6. Molecular evolution: The origin of genomes. Evolution of new genes. Origin of eukaryotic genomes. Phylogenetics. Application of molecular phylogenetics.



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References

1. Lewin Benjamin. Genes. Oxford University press.
2. Brown TA. Genomes. John Willey and Sons.
3. Snustad, Simmons and Jenkins. Principles of Genetics. John Willey and Sons.
4. Weaver and Hendrick. Genetics. Wm. C. Brown Publishers.
5. Hawkins J.D. Gene Structure and Expression. Cambridge University Press.

Biophysics

1. pH and buffer solutions- hydrogen ion concentrations and pH, dissociation of acids and bases. Measurement of pH using organic indicator molecule and potentiometric method. Functions of buffers in a biological system. Use of buffers in biological and biochemical research. pH and life. Henderson and Hasselbalch equation.
2. Chromatography: Principles of chromatography. Types of chromatography (Brief account).
3. Electrophoresis: Electrophoretic mobility, principles, PAGE, Agarose gel electrophoresis. Separation and detection of macromolecules by electrophoresis. Electrophoretic apparatus, technique and procedure.
4. Centrifugation - Theory of centrifugation. Centrifuge- Types, Methodology of centrifugation, applications.
5. Colorimetry and spectrophotometry: Beer-Lamberts law. Measurement of extinction. Colorimeters and spectrophotometers.
6. Techniques and applications in biological and biochemical research. Comparison between colorimetry and spectrophotometry.
Radiobiology: Autoradiography. principles, types. Methods and applications in biological research.
7. Immunochemistry: Immune response. Antigens- Antibodies. Histo-incompatibility antigens; Structure of IgG. Immunochemical assays - RIA, ELISA.
8. Cryobiology: Freeze drying (lyophilization) - applications.

References

1. Hoppe, W. (Ed.). Biophysics. Springer Verlag.
2. Rogers, A.W. Techniques of Autoradiography. Elsevier.
3. Roy, R.N. A Text Book of Biophysics. New Central Book Agency Pvt. Ltd, Calcutta.
4. Sasidharan, A. Selected Topics of Biophysics. Frontier Area Publishers.
5. Slayter, E.M. Optical methods in Biology. Wiley Intersciences.
6. Wong, C.H. Radiation Tracer Methodology in Biophysical Sciences. Prentice Hall.
7. Plummer, D. An introduction to Practical Biochemistry. Tata Mc Graw Hill, New Delhi.



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Cytogenetics, Genetics, Biostatistics, Plant Breeding & Evolution

BOT2C05 – Cytogenetics, Genetics, Biostatistics, Plant Breeding & Evolution

Cytogenetics

1. Cytogenetics of aneuploids, euploids and structural heterozygotes: Effect of aneuploidy on phenotype. Transmission of monosomics and trisomics and their uses. Breeding behaviour and genetics of structural heterozygotes; translocation heterozygotes; Robertsonian translocation; B-A translocation. Karyotype-concepts and its importance. Structural chromosome aberrations- types and significance in evolution. Heteroploidy, aneuploidy, monosomy, trisomy (primary, secondary, tertiary and compensating). Nullisomy. Uses of aneuploidy in cytogenetics. Euploidy- autopolyploidy, allopolyploidy and segmental allopolyploid diploidization. Role of aneuploidy and euploidy in evolution.
2. Molecular cytogenetics: Multigenic families and their evolution; in situ hybridization- concept. Computer assisted chromosome analysis, chromosome micro-dissection and micro-cloning; flow cytometry.
3. Polytene and lampbrush chromosomes- cytogenetic importance.
4. Supernumerary chromosomes: B-chromosomes.

References

1. Alberts B., D. Bray, J. Lewis, K. Roberts and J. D. Watson. Molecular Biology of the Cell Garland Publishing Inc. New York.
2. Atherly A.G., J.R. Girton and J.F. McDonald. The Science of Genetics. Saunders College Publishing, Fort Worth, USA.
3. Burnharm C.R. Discussions in Cytogenetics. Burgess Publishing Co., Minnesota.
4. De Robertis E.D.P. and De Robertis E.M.F. Cell and Molecular Biology ISBN, Hong Kong.
5. Dupraw E.J. DNA and Chromosomes. Holt, Rinehart and Winston Inc. New York.
6. Hart D.L and E.W. Jones. Genetics: Principles and Analysis. Jones & Bartlett publishers, Massachusetts, USA.
7. Khush, G.S. Cytogenetics of Aneuploids. Academic Press.
8. Karp G. Cell and Molecular Biology: Concepts and Experiments. John Wiley & Sons, Inc. USA.
9. Lewin B. Gene. Oxford University Press, New York, USA.
10. Lewis R. Human Genetics: Concepts and Applications. WCB Mc Graw Hill, USA.
11. Malacinski G.M and D. Freifelder. Essentials of Molecular Biology. Jones and Bartlett Publishers Inc., London
12. Rieger R., A. Michaelis and M. M. Green Glossary of Genetics and Cytogenetics - Classical and Molecular. Springer-Verlag, New York.
13. Swanson C.P., T. Merz, and J. W. Young. Cytogenetics. Prentice Hall.



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Genetics

1. Relevance of Mendelism in modern genetics. A critical evaluation of Mendelism on the basis of modern concept of genes.
2. Linkage and gene mapping. Three- point test cross; linkage map; interference; tetrad analysis and centromere mapping. **Linkage in humans. Pedigree analysis.** Genetic recombination and mapping of genes in bacteria and bacteriophages.
 3. Mobile genetic elements: Transposable elements in bacteria. IS elements. Tn elements. Cmp site transposon. Cepia and P elements in Drosophila. Ac, DS and Mu elements in maize. Retrotransposons- Molecular characteristics and significance in development and evolution.
 4. Extranuclear inheritance: Analysis of mitochondrial and chloroplast genomes and their utility. Cytoplasmic male sterility.
 5. Quantitative genetics: Polygenic inheritance, heritability and its measurements. QTL mapping.
 6. Population genetics: Systems of mating. The Hardy-Weinberg principle. Estimation of gene frequencies. Factors affecting equilibrium: natural selection, mutation, migration and genetic drift.
 7. **Human genetics: Human pedigree analysis, Lod score for linkage testing. Karyotype; genetic disorders.**

References

1. Snustad, Simmons and Jenkins. Principles of Genetics. John Willey and Sons.
2. Weaver and Hendrick. Genetics. Wm. C Brown Publishers.
3. Goodenough. Genetics. Saunders College Publishing.
4. Stansfield. Theory and Problems of Genetics. Mc Grow Hills.
5. Strickberger. Genetics. Macmillan.
6. Burnet L. Essential Genetics. Cambridge University Press.
7. Friefelder. Microbial Genetics. Narosa Publishing House.
8. Gardner, Simmons and Snustad. Principles of Genetics. John Wiley and Sons, New York, USA.
9. Singh B.D. Fundamental of Genetics. Kalyani Publishers, New Delhi.

Biostatistics

1. The science of statistics and its applications in biological research.
2. Types and collection of data- Census and sampling- theory and methods.
3. Tabulation and presentation of data- diagrammatic and graphic presentation.
4. Analysis of data- central tendencies.
5. Measures of dispersion - Range, quartile deviation, mean deviation, standard deviation and standard error. Relative measures of dispersion - coefficient of variation.
6. Tests of significance- formulation and testing of hypothesis- testing the probability of committing type 1 and type 2 errors. z test, t test, chi-square test.



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- Analysis of variance- one way classification and two-way classification, F test, F value calculation, F table.
- Correlation and Regression analysis- coefficient of correlation- significance testing. Rank correlation. Lines of regression- coefficient of regression.
- Experimental designs- designing an experiment- CRD, RBD, LSD. Factorial experiments.
- Probability- application of the principles of probability- theorems of probability- applications- Probability distributions- binomial, multinomial, normal and poisson distributions.
- Statistical softwares- SPSS, SPAR, MINITAB.

References

- Chandal S.R.S. A Handbook of Agricultural Statistics. Achal Prakashan Mandir, Kanpur, India.
- Das M.N. and N.C. Giri. Designs and Analysis of Experiments. Wiley Eastern Ltd.
- Elhance and Elhance. Fundamentals of Mathematical Statistics. Kithab Mahal, New Delhi, India.
- Gupta S.K and V.K. Kapoor. Fundamentals of Mathematical Statistics. Sultan Chand & Sons, New Delhi.
- Gupta C.B. An Introduction to Statistical Methods. Vikas Publishing House Pvt. Ltd.
- Kemphrone, O. An introduction to Genetic statistics. John Wiley and Sons Inc. New York.
- Mather K. and J.L. Links. Biometrical Genetics. Chapman and Hall, London.
- Panse, V.G and P. Sukatme. Statistical Methods for Agricultural Workers. ICAR, New Delhi.
- Rao C.A. Advanced Statistical Methods in Biometrical Research. Wiley and Sons, New York.
- Singh P. and S.S. Narayanan. Biometrical Techniques in Plant Breeding. Kalyani Publishers, New Delhi.
- Singh R.K. and Chaudhary B.D. Biometrical Methods in Quantitative Genetic Analysis. Kalyani Publishers, New Delhi.
- Daniel W.W. Biostatistics- A foundation for Analysis in Health Sciences.

Plant Breeding

- Introduction and objectives.
- Organizations involved in plant breeding.
- Breeding systems in sexually propagated plants- Floral Biology and its significance in plant breeding. Sterility and incompatibility systems.
- Genetic resources- centers of crop genetic diversity. In situ and ex situ conservation; cryopreservation of germplasm.
- Conventional methods of plant breeding:
Domestication of wild plants- changes under domestication.



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Plant introduction- history, types, principles, plant introduction agencies in India- rules and regulations. Major achievements

Selection- selection methods in sexually and vegetatively propagated species. Selection in segregating populations. Major achievements.

Hybridization- history, objectives, techniques, consequences and major achievements. Heterosis breeding- genetic basis of heterosis and inbreeding depression.

Modern methods of plant breeding:

1. Mutation breeding- history, methodology, applications, merits, demerits and achievements. Polyploidy breeding- methodology, applications, merits, demerits and achievements.
2. Biotechnological approaches in plant breeding- Molecular markers and their uses- Transgenic plants- critical evaluation
3. Breeding for special purposes: Resistance breeding- a brief account of disease resistance, pest resistance,
4. stress resistance- achievements. Quality breeding- objectives and achievements.
5. Biometrical techniques in Plant Breeding- analysis of variability, heritability, genetic advance and combining ability.
6. IPR- Protection of plant variety and farmers' right act.

References

1. Allard R.W. Principles of Plant Breeding. John Wiley and Sons, New Delhi.
2. Chahal G.S. and Gosal S.S. Principles and Procedure of Plant Breeding. Narosa Publishing House, New Delhi.
3. Jain H.K. and Kharkwal M.C. Plant Breeding- Mendelian to Molecular Approaches. Narosa Publishing House, New Delhi.
4. Roy D. Plant Breeding- Analysis and Exploitation of Variation. Narosa Publishing House.
5. Hayward M.D., Bosemark N.O. and Romagasa I. Plant Breeding- Principles and Prospects. Chapman & Hall.
6. Gupta S.K. Plant Breeding- Theory and Techniques. Agrobios (India), Jodhpur.
7. Khan M.A. Plant Breeding. Biotech Books, New Delhi.
8. Stoskopf N.C. Plant Breeding- Theory and Practice. Scientific Publishers (India), Jodhpur.
9. Sharma J.R. Principles and Practices of Plant Breeding. Tata Mc Graw Hill.
10. Chopra V.L. Breeding Field Crops. Oxford & IBH.
11. Mohanan K.V. Essentials of Plant Breeding. PHI Ltd., New Delhi.
12. Mohanan K.V. Essentials of Plantation Science. Penta Book Publishers, Calicut, Kerala.

Evolution

1. The concept of evolution- evidences of evolution- geological time scale and evolution.
2. Origin of life- theories and experimental evidences- chemical evolution and biological evolution.
3. Evidences of evolution.



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- Theories of evolution- Pre-Darwinian, Darwinian and Post Darwinian theories - Modern synthetic theory of evolution.
- Reproductive isolation and the origin of species.
- Evolution at the molecular level

Plant Ecology, Conservation Biology, Phytogeography & Forest Botany

BOT2C06 –Plant Ecology, Conservation Biology, Phytogeography & Forest Botany

- Habitat Ecology: Salient features of terrestrial (Biomes), fresh water (Limnology), wet land and marine habitats.
- Productivity and Energy flow: Concepts, limits and process of primary production; methods of productivity measurements: global trends in primary productivity, energy flow models.
- Population characteristics: density, natality, mortality, distribution, biotic potential, carrying capacity, aggregation and dispersal, ecotone and edge effect.
- The environment and its pollution- types (land, air and water). Effect on living organisms. Control with emphasis on biological methods. Environmental hazards.
- Threats to the global environment- greenhouse effect, ozone depletion, El-Nino and La Nina effects.
- Environment impact assessment (EIA) and assessment of environmental hazards- remote sensing.
- Problems of conservation; causes of threat to environment- human interference, deforestation, habitat destruction, overexploitation of resources.
- Identification of threatened plants; red list categories- extinct, endangered, vulnerable, rare and out of danger. Extinction process. Hot spots, keystone species and flagship species.
- Strategies for conservation: in situ and ex situ conservation, biosphere reserve, national parks, wildlife sanctuaries. Gene banks, cryopreservation, seed banks.
- Afforestation- social forestry, agroforestry. International biological programme (IBP), Man and biosphere programme (MAB), IUCN, world environment day, wild life preservation act (1972), Indian forest (conservation) act (1980) and United Nations Environment Programme. Environment Protection Acts.
- Environmental awareness- role of government and NGOs. -Gaia hypothesis
- Biodiversity- significance at Local, National and Global levels. Deep ecology (Paradigm shift from anthropocentric ecology to ecocentric ecology. National heritages.

References

- Negi, S.S. Hand book of National Parks and Sanctuaries in India.



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- M.P. Nair and P.K Sastry - Red data book of Indian plants.
- Mehrotra and B.K Suri - Remote sensing for environment and forest management.
- Negi S.S - Biosphere reserves in India.
- Lucas and Syngé - IUCN Red data book. IUCN, Stockholm
- Dasman R.F - Environmental Conservation.
- Odum E.P. Fundamentals of ecology
- Odum E.P. Basic principles of ecology
- Misra K.R. Ecology workbook.
- Puri G.S. - Indian Forest Ecology Volumes I and II. Oxford & IBH.
- Clarke G.L - Elements of Ecology.
- Chhatwal G.L. Encyclopedia of environmental biology.
- Ray P.K. - Pollution and Health. Willey-Eastern Ltd, New Delhi.
- Michael P.- Ecological methods for field and laboratory investigations. Tata McGraw Hill, New Delhi.
- Kershaw K.A. Quantitative and Dynamic Plant Ecology. ELBS.

Phytogeography

- Patterns of plant distribution: continuous distribution: circumpolar, circumboreal, circum austral, pan tropical.
 - Discontinuous distribution: Theory of land bridges, theory of continental drift, theory of glaciation.
 - Endemic distribution (neoendemic, paleoendemic), age and area hypothesis.
 - Phytochoria of world and India.

References

- Ronald Good. The geography of flowering plants. Lcngmans.
- Bharucha F.R. A text book of plant geography of India. Oxford University Press.
- Puri G.S. Indian Forest Ecology, Vol I, II. Oxford, New-Delhi.

Forest Botany

- Forest- Definitions. Study of various types of forests in the world and in India.
- Forest products- Major and minor with special reference to Kerala.
- Influence of forests on environment. Consequence of deforestation and industrialization- sustainable utilization of bioresources.

References

- Agarwal A. P. Forests in India. Oxford & IBH.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Gregory G. R. Forest products, production, trade and consumption, quantity and value of raw materials requirements. Ford foundation, New-Delhi.
- Puri G.S. Indian Forest Ecology Vol. I& II. Oxford & IBH.
- Champion G. H. and Seth S.K. A revised survey of the forest types of India.

Practicals of Cell Biology, Molecular Biology, Biophysics, Cytogenetics

BOT2L03 Practicals of Cell Biology, Molecular Biology, Biophysics, Cytogenetics **Cell Biology**

- Study of Mitosis in root tip cells.
- Pre-treatment of root tips with colchicine /hydroxy quinoline /paradichlorobenzene and study of chromosomes in Chlorophytum, / Zea mays/ Crotalaria/ Cyanotis.
- Isolation of plastids and mitochondria.
- Chromosome banding

Molecular Biology

- Working out problems from molecular genetics.
- Isolation of nucleic acid and identification of histones by SDS-PAGE.
- Isolation of plant DNA and its quantification by spectrophotometric/ calorimetric method.
- Immunological techniques: ELISA and Western Blot.

Biophysics

- Preparation of buffers and measurement of pH using pH meter.
- Determination of isoelectric pH.
- Paper chromatography: Separation of sugars.
- Thin layer chromatography- separation of amino acid mixtures.
- Calorimetric and spectrophotometric estimation of proteins by Biuret / Lowry's method.
- Estimation of amino acid by ninhydrin method (colorimetric).

Cytogenetics



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1. Induction of polyploidy using colchicine; different methods of the application of colchicine.
2. Effect of induced and spontaneous polyploidy on plant phenotype, meiosis, pollen and seed fertility and fruit set.
3. Preparation of karyotype and ideogram of plant meristematic cells.
4. Cytological studies in callus tissues.
5. Study of meiosis in translocation heterozygotes (Rheo discolor)
6. Study of polytene chromosomes.

Preparation of lab record and submission for valuation.

Visit to a reputed molecular biology lab and submission of a report.

Genetics, Biostatistics, Plant Breeding, Plant Ecology, Conservation Biology, Phytogeography & Forest Botany

BOT2L04 – Genetics, Biostatistics, Plant Breeding, Plant Ecology, Conservation Biology, Phytogeography & Forest Botany

Genetics

1. Problems from linkage, tetrad analysis, quantitative genetics and population genetics.

Biostatistics

1. Problems from Mean, standard deviation, Coefficient of variation, tests of significance and correlation analysis.
2. Use of computer programmes for statistical analysis.

Plant Breeding

1. Study of floral morphology and flower structure in crop plants- rice, cashew, pulses, Solanum, Capsicum.
2. **Practice of hybridization technique in self- and cross-pollinated plants mentioned in (1).**
3. Biometrical techniques in Plant Breeding- analysis of variability.

Ecology and Conservation biology

1. Determination of food chains and food web in aquatic ecosystem.
2. Determination of the minimum size of the quadrat suitable for an area using species area curve method.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Determination of the Importance Value Index (IVI) of plant species in the community by quadrat, line and belt transect methods.
- Comparative study of polluted and non-polluted aquatic ecosystems.
- Visit to a meteorological station, national park or wild life sanctuary, sewage treatment unit and major construction site.
- Estimation of dissolved oxygen content in the water sample by Winkler's method.
- Determination of primary production in water samples by light and dark bottle method (Winkler's method).
- Determination of dissolved carbon dioxide content in water samples.
- Determination of frequency of plant species of an area and heterogeneity of vegetation using transect method.

Phytogeography

- Identification of the various floristic and vegetational regions of the world and India in maps.

Forest Botany

- Study of the major and minor forest products of Kerala and their uses.

Preparation and submission of lab record

Visit to one plant breeding station and one ecologically sensitive area and submission of reports

Biotchnology and Bioinformatics

BOT3C09 – Biotechnology and Bioinformatics

Biotechnology

A. Plant Tissue Culture

- Basic concepts and history.
- General account of laboratory facilities and management.
- Media for in vitro culture, composition and their preparation.
- Callus culture- selection of explants and medium- types of callus- growth profile of callus.
- Cell culture - isolation of single cells- mechanical and enzymatic methods- measurement of growth of cells in suspension culture- viability tests.
- Large scale cultivation of cells using bioreactors for secondary metabolite production.
- Organogenesis- direct and indirect- factors affecting organogenesis.



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8. Organ culture – apical/ axillary meristems, embryo, ovary, ovule, endosperm, anther, pollen and root cultures.
9. Applications of plant tissue culture - clonal propagation, somaclones, somatic hybrids, synthetic seeds, secondary metabolites, germplasm conservation –cryopreservation.

Genetic Engineering

1. Molecular analysis of gene and gene products: southern, northern and western blots- restriction maps- RAPD and RFLP. Chromosome walking and jumping. FISH. PCR and its applications. DNA finger printing. DNA chips.
2. DNA sequencing: Enzymatic methods. Gilbert and Maxam method. Messing's shot gun method. Fluorescent detection and automation. The Human Genome Project.
3. Recombinant DNA Technology- Enzymes, vectors, gene-cloning strategies, construction and screening of gene and cDNA Libraries. Expression of cloned genes in bacteria and mammalian cells. Prospects and achievements.
4. Transgenic plants. Gene cloning strategies in plants. Vector dependent and vector independent methods. Identification and selection of transformed plants; the reporter enzyme technology. Objectives and achievements- engineering for secondary metabolites; resistance against herbicides, pests, pathogens, stress - improved nutritional and status changes in plants. Plants as bioreactors; phytopolymers and biodegradable plastics; antisense RNA technology; transgene inactivation. Terminator and traitor technologies.
5. Cloning: objectives. Creation of transgenic animals- other developments in cloning. Human cloning. Ethics of cloning.
6. Patenting of genes and GMOs. Gene piracy. Ethics and biosafety aspects, rec DNA safety; IPR, biosafety protocols.

References

1. Walker J.M. and R. Rapley. Molecular Biology and Biotechnology: Panima Publishing Corporation.
2. Bernard R. Glick and Jack J. Pasternack. Molecular Biotechnology Principles and Applications of Recombinant DNA: ASM Press Washington
3. Brown T.A. Gene Cloning and DNA Analysis Blackwell Science Pub:
4. Primrose S.B. Molecular Biotechnology. Panima Publishing Corporation.
5. Maarten J. Chrispeels and D.E.Sadava. Plants, Genes and Agriculture. Jones and Bartlett Publishers.
6. Robert de la Pemere and Franck Seuret. Brave New Seeds: The threat of GM crops to farmers. Global Issues Series.



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Bioinformatics

A. Computer application.

1. Computer in Science with special reference to biology, the scope and prospects.
2. Information super highway (Internet)- Information networks: Internet, World Wide Web. Web browsers, HTTP, HTML and URLs. Biological networks.
3. Online publications with special reference to biology, -electronic journals, books, downloading and uploading.)- Open Archive Initiative (www.openarchives.org), biomedcentral, pubmedcentral, freedom of scientific information access, e-access debate- concepts and implications, Free Software Movement, Free Software Foundation, GNU/Linux, etc. Online archives, databases, the Public Library of Science (www.publiclibraryofscience.org).

References

Online resources freely available at internet sites such as

1. www.publiclibraryofscience.org
2. www.openarchives.org
3. www.pubmedcentral.gov
4. www.biomedcentral.com
5. www.nature.com/nature/debates/e-ccess/index.html

Bioinformatics

1. Introduction: Importance and scope.
2. Biological Databases
 - a. Nucleic acid databases: EMBL, GenBank- structure of GenBank entries. Specialized genomic resources, UniGene.
 - b. Protein sequence databases: PIR, SWISS-PROT, TrEMBL. Composite protein databases: NRDB, OWL.

Secondary databases: PROSITE, PRINTS, BLOCKS, IDENTIFY. Structure classification databases- SCOP, CATH.

1. Database searching
 - a. Sequence database searching. EST searches. Different approaches to EST analysis. Merck/IMAGE, Incyte, TIGR. EST analytical tools. Sequence similarity, sequence assembly and sequence clustering.
 - b. Pair wise alignment technique: Comparison of sequences and sub-sequences. identity and similarity. Substitution matrices, BLOSUM, DOTPLOT and BLAST.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- c. Multiple alignment technique: Objective, Manual, simultaneous and progressive methods. Databases of multiple alignments. PSI-BLAST, CLUSTAL-W.
2. Protein structure Prediction:
 - a. Secondary structure prediction. Chou- Fasman, J Pred.
 - b. Tertiary structure prediction: Comparative modelling - Modeller, RasMol.
3. **Emerging areas of Bioinformatics: DNA Microarrays, functional genomics, comparative genomics, pharmacogenomics, chemoinformatics, medical informatics.**

References

1. Attwood T.K. and D.J. Arny-smith. Introduction to Bioinformatics. Pearson Education.
2. Sundararajan S. and R. Balaji, Introduction to Bioinformatics. Himalaya Publishing House.

Practicals of Plant Physiology, Metabolism, Biochemistry, Angiosperm Morphology,

And Taxonomy

BOT3L05 Practicals of Plant Physiology, Metabolism, Biochemistry, Angiosperm Morphology, And Taxonomy

Plant Physiology

1. Determination of water potential by tissue weight change method.
2. Extraction of leaf pigments and preparation of absorption spectra of chlorophylls and carotenoids.
3. Demonstration of Hill reaction.
4. Separation of leaf pigments by paper chromatography and column chromatography.
5. Effects of light intensity on photosynthesis by Wilmot's bubbler.
6. Determination of sugars and amino acids in germinating seed by TLC.
7. Extraction of seed proteins based on solubility.
8. Biochemical analyses of leakages from seeds during germination.
9. Analyses of proline in water stressed plants.
10. Testing of seed viability by NBT test.
11. Changes in the reserve proteins during germination.



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Metabolism

1. Extraction of enzyme: Any enzyme.
2. Effect of substrate on enzyme and determination of its Km value.
3. pH dependent activity profile of enzymes.
4. Ammonium sulphate precipitation of enzymes.
5. Desalting of proteins by gel filtration using Sophadex G25/ dialysis
6. Separation of isoenzymes by native PAGE.
7. Determination of enzyme / protein sub units by SDS PAGE.
8. Metabolism of germinating seeds - changes in metabolisable carbohydrates.

Biochemistry

1. Qualitative tests for monosaccharides, reducing and non-reducing oligosaccharides, starch, amino acids and protein.
2. Quantitative estimation of reducing sugars and starch.
3. Qualitative tests for lipids. Emulsification, saponification, acrolein test, Boundouin's test.
4. Quantitative estimation of amino acids.
5. Quantitative estimation of protein by Biuret / Branford's /Lowry et al method.
6. Quantitative estimation of DNA and RNA (colorimetric / spectrophotometric)
7. Quantitative estimation of total phenolics.

Angiosperm Morphology

1. Preparation of cleared whole mounts of floral parts to show vasculature.
2. Examination of the following with the help of dissections and hand sections: Transmitting tissues/canals in style and stigma; Different types of ovaries; Different types of placentation, vasculature of androecium and gynoecium in special types of flowers.

Angiosperm Taxonomy

1. Familiarization with local flora and construction of keys – use of floras in identification up to species.
2. Study of diagnostic features of the families studied in the theory paper with special reference to their economic aspects.
3. Study of the following families with special reference to morphology of modified parts, economic importance, interrelationships and evolutionary trends: Magnoliaceae, Ranunculaceae, Menispermaceae, Nymphaeace, Polygalaceae, Caryophyllaceae, Clusiaceae, Sterculiaceae, Meliaceae, Sapindaceae, Rosaceae, Melastomaceae, Rhizophoraceae, Aizoaceae, Rubiaceae, Sapotaceae, Gentianaceae, Boraginaceae, Convolvulaceae,



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Scrophulariaceae, Pedaliaceae, Verbenaceae, Nyctaginaceae, Euphorbiaceae, Urticaceae, Casuarinaceae, Orchidaceae, Zingiberaceae, Amaryllidaceae, Commelinaceae, Araceae, Cyperaceae and Poaceae.

- Dissection of at least two members of each family in the laboratory, making suitable sketches, describing them in technical terms and identifying them constructing appropriate floral diagrams.
- Field study of three days under the guidance and supervision of teachers at an ecologically different locality and submission of a field study report certified by the teacher concerned. The report should contain ecology of flora of the area studied.
- Collection of plant specimens following the standard means of plant collection for preparation of herbarium. Each student shall submit a minimum of 25 such herbarium specimens with QR code along with the field book for the Practical examination.
- Problems in Bar Coding.

Practicals of Plant Resources, Biotechnology And Bioinformatics

BOT3L06 Practicals of Plant Resources, Biotechnology And Bioinformatics

Plant Resources

- Morphological study of the source plants mentioned in the theory syllabus and identification of the plants and plant products.

Biotechnology- A. Tissue Culture

- Preparation and sterilization of culture media.
- Culturing of Carrot /Tobacco/Datura.
- Estimation of cell growth in callus culture by fresh wt. and dry wt.
- Induction of multiple shoots using axillary and apical meristems as explants.



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- Plantlet regeneration from callus.
- Identification of secondary metabolites in cultures.

Biotechnology- B. Genetic Engineering

Isolation of DNA.

Bioinformatics

A. Computer Application

- Acquiring basic computer operation and internet browsing skills in Windows and Linux platforms.
- Acquiring basic word processing/ data entry skills using popular (both commercial and opensource) packages such as MS-Word, K-Word, Open Word, PageMaker.
- Acquire graphic processing skills using popular packages such as Photoshop, Corel Draw, Chem Draw.
- Preparation of scientific presentations using packages such as MS-PowerPoint.
- Use of statistical packages such as SPSS, Biostat, Origin, MS-Excel.
-

Bioinformatics

- Acquisition of basic skills in Internet browsing
- Use of web browsers and search engines.
- Use of biological and bioinformatic websites Agris, Agricola, BIOSIS, CABWeb.
- Visit to Bioinformatics websites: NCBI, SWISS PROT, PIR, PDB.

Submission of lab record

Submission of 10 plant products directly collected by the student from the field with a note on the source plant and plant part.



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Environmental Biology and Biodiversity Conservation

BOT4E01 Environmental Biology and Biodiversity Conservation

- Population ecology:** Properties (concepts of rate, intrinsic rate of natural increase, carrying capacity, population fluctuations and cyclic oscillations, density independent and density dependent mechanisms of population regulation, patterns of dispersion, Allee principle of aggregation and refuging, home range and territoriality, energy partitioning and optimization, r and K selection).
- Community ecology:** Types of interaction between two species, coevolution, evolution of cooperation, group selection, interspecific competition and coexistence, positive and negative interactions, concepts of habitat, ecological niche and guild.
- Human population:** Expansion and its causes, rich and poor nations, consequences, dynamics, Cairo conference 1994.
- Major global environmental challenges:** Acid rain, Ozone depletion, climate disruption, deforestation, land degradation and desertification, freshwater degradation and shortage, marine fisheries decline, loss of biological diversity and excess nitrogen.
- Global initiatives:** Stockholm conference (1972), Rio (1992), Ramsar convention (1971), Kyoto (1997), Johannesburg (2002), Stockholm (2011).
- Environmental Law- International and National:** The Environment Protection Act & Rules 1986; Water (Prevention & Control of Pollution) Act 1974; Biodiversity Act (2002).
- Thoughts on ecology:** Contributions of Buddha, Rabindranatha Tagore, Mahatma Gandhi, Rachel Carson, Gro Herlem Brundtland, Vandana Siva, Edward O Wilson, Aldo Leopald.
- Biodiversity:** a). Genetic diversity, agrobiodiversity and cultivated taxa, causes of decline, value of wild species, conservation practices- traditional (*upavana vinoda*, sacred groves, *sthalavrikshas*) and modern (*in situ* and *ex situ*).
b). Biodiversity information management and communication- libraries, databases (taxonomic database working groups for plant sciences, data bases on biodiversity); distribution of biodiversity information, metadatabases, virtual libraries.
- Ecosystem capital- use and restoration:** Global perspective on biological systems; conservation, preservation and restoration. Biomes and ecosystems under pressure (forest biomes, ocean ecosystems).
- Habitat studies:** Wetlands (Ramsar sites), mangroves and forest types of Kerala.
- Brief study of the following:** Cybernetics, ecological foot print, sustainable development, deep ecology, Gaia hypothesis, conservation ethics, peoples' movements for biodiversity conservation, role of NGOs and educational institutions in biodiversity conservation, trade related IPR, ecotourism.
- Climate change and its impacts-** brief study.
- Disaster management-** basic aspects.



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References

1. Champion H.G. and Seth S.K. A Revised Classification of Forest Types of India. Govt. of India, New Delhi.
2. Gadgil Madhav. Ecological Journeys. Permanent Black, Delhi.
3. Jaiswal P.C. Soil Plant and Water Analysis. Kalyani Publishers, Ludhiana.
4. Krishnamurthy K.V. An Advanced Text Book on Biodiversity Principles and Practice. Oxford IBH.
5. Misra R. Ecology Workbook. Oxford IBH.
6. Odum E.P. and Barrett G.W. Fundamentals of Ecology. Thomson Books, Bangalore.
7. Palmer J.A. Fifty Thinkers on the Environment. Routledge, London.
8. Puri G.S. Indian Forest Ecology. Oxford IBH.
9. Pushpangadan P. and Nair K.S.S. Biodiversity and Tropical Forests- The Kerala Scenario. STEC, Thiruvananthapuram.
10. Sarngdharacharyar. (Translated by Vishnu B.). *Vruksha ayurvedam* Janapriya Pusthakasala, Kottayam.
11. Sivadasan M. and Mohanan K.V. Biodiversity and Ecology: Concepts and Facts. Department of Botany, University of Calicut, Kerala.
12. Speth Gustave James and Haas M. Peter. Global Environmental Governance. Pearson Longman, New Delhi.
13. Vijayalakshmi.K . and Shyam Sundar K.M- Vrikahayurveda- An introduction to Indian plant science. Lok Swasthya parampara samardhan samithi, Madras.
14. Wright T.Richard. Environmental science- Towards a sustainable future- Prentice HallLearning Pvt. Ltd., New Delhi.

Genetic Engineering

BOT4E02 Genetic Engineering

1. Structure of genes in prokaryotes and eukaryotes. Genetic code and codons. Gene expression.
2. **Recombinant DNA technology: Tools of rDNA technology, methods of creating rDNA molecules, restriction mapping, isolation and separation of genetic material, southern, northern, western, southwestern and northwestern blotting techniques.**
3. **Gene transfer techniques in plants- Agrobacterium mediated transfer, gene gun method, electroporation, microinjection, chemical methods.**
4. Molecular markers- RAMPO, SSCP, RFLP, RAPD, AFLP, EST markers, Repetitive DNA, Microsatellite and Minisatellite.
5. **DNA sequencing- chemical and enzymatic methods. Importance of DNA sequencing.**



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6. Gel electrophoresis- techniques for visualization and reading sequences.
7. Polymerase Chain Reaction- history, methodology of PCR. Variations from Basic PCR- reverse transcriptase PCR, nested PCR, inverse PCR- applications of PCR.
8. DNA profiling- history, methodology of genetic fingerprinting- applications.
9. Genetic engineering for crop improvement – transgenic plants.
10. Cloning of genes and production of vaccines, drugs, growth hormones and chemicals.
11. Gene therapy- types of gene therapy. Getting transgenes in to patients- viral and non-viral approaches. Success of gene therapy.
12. Abatement of pollution through genetically engineered microorganisms- an emerging approach towards environmental clean-up programmes.
13. Nanotechnology and its applications in genetic engineering.

References

1. Hartl D.L. and Jones E.W. Genetics- Analysis of genes and genome. Jones and Bartlett Publishers.
2. Nicholl Desmond S.T. An Introduction to Genetic Engineering. Cambridge Pub.
3. Brown T.A. Gene Cloning and and DNA Analysis. Blackwell Science Pub.
4. Dubey R.C. A Text Book of Biotechnology. Chand Pub.
5. Singh B.D. Biotechnology. Kalyani Publishers.
6. Walker and Rapley. Molecular Biology and Biotechnology. Panima Pub.
7. Chrispeels M.J. and Sadava D.E. Plants, Genes and Agriculture.
8. Lewin B. Genes. Oxford University Press.
9. Mason A.C. Principles of Gene Manipulation and Genomics.
10. Rissler J. and Mellon M. The Ecological Risks of Engineered Crops. MIT Press, Cambridge.
11. Avice, John C. The Hope, Hype and Reality of Genetic Engineering.
12. McYYan R.P. Genetics and Genetic Engineering. Saras Publications.
13. Narayana L.M. Molecular Biology and Genetic Engineering.
14. Khadpekar N.R. The Age of Nanotechnology. ICFAI University Press, Hyderabad.
15. Nalwa H.R. Encyclopedia of Nanoscience and Technology.



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Practicals of Environmental Biology and Biodiversity Conservation & Genetic

Engineering

BOT4L07 Practical of Environmental Biology and Biodiversity Conservation & Genetic Engineering

Environmental Biology and Biodiversity conservation Practicals

1. Studies on the following and submission of reports: Waste water treatment plant, local environmental peculiarities (such as hillocks and forest patches), wet land ecosystem, alien invasive plants, degraded ecosystem, different forest types, effluent treatment system).
2. Physical and chemical analysis of soil and water: Particle size analysis of soil, estimation of particle density using relative density or volumetric flask; Air capacity analysis of soil by field method; Soil pH analysis of soil using pH meter. Water analysis for pH using pH meter, estimation of BOD by Winkler's method (dark and light bottles).
3. Study of community structure: Charting and mapping of vegetation, Raunkiaer's life forms, biological spectrum, profile diagram (soil).
4. Study of ecological succession: Different types of ecological successions.
5. Visit to an ecological sensitive area and submission of a report.

Genetic Engineering Practicals

1. Working out problems in genetic engineering.
2. Isolation of plant DNA and its quantification by spectrophotometer.
3. Isolation of plasmid DNA from E. coli.
4. Gel electrophoresis- gel preparation, casting, elution and staining.
5. Visualization of DNA by agarose gel electrophoresis and gel reading.
6. Construction of coding sequence of DNA using amino acid sequence.
7. Visit to a genetic engineering lab and submission of a report.



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Library, Information and Society

BLIS 01 Library, Information and Society

Unit 1

Library in the Social Context

Library: Conceptual change

Role of libraries in modern society and Education

Development of libraries in India

Five Laws of Library Science

Implications of Five Laws

Unit 2

Types of Libraries

Types of libraries: their distinguishing features and functions

Public libraries, special libraries

Academic libraries: School, college and university libraries

National libraries: UK, USA, USSR

National library of India

Unit 3

Resource Sharing and Extension Services

Resource sharing

Library consortia: ShodhSindhu, FORSA, CeRA

Library extension services, library publicity

Library Networks: OCLC, NICNET, CALIBNET, DELNET, ERNET, INFLIBNET

Library public relations

Unit 4

Library Legislation



CRITERION	I	Curricular Aspects
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Need for library legislation

Essential features of library legislation

Library legislation in India- Model Public Library Bill of Dr. S. R. Ranganathan

Public library legislation in Kerala; Kerala Public Libraries Act, 1989

Indian Copy Right Act, Delivery of Book and Newspapers Act and the Press and Registration of Books Act National Knowledge Commission of India

Unit 5 Library and Information Science Profession

Librarianship as a profession

Professional skills and competencies

Professional ethics

Professional associations and their role: IFLA, ILA, IASLIC, IATLIS, CILIP, SLA, ALA, ASLIB

Promotion of library and information services by UNESCO, UGC and RRRLF

Library and Information Science Education in India

Reading list

1. Choudhury, G. G. et al. Librarianship: An introduction. London: Facet, 2004.
2. Ajaykumar Raval. Handbook of public library system. New Delhi: Discovery Publishing, 2013.
3. Anil K Dhiman and Suresh C Sinha. Academic Libraries. New Delhi: Ess Ess Publication, 2002.
4. Anil K Dhiman. Handbook of special libraries and librarianship. New Delhi: Ess Ess Publication, 2008
5. Khanna, J. K. Library and society. New Delhi: Ess Ess Publications, 1994.
6. Kumar, P. S. G. Library in India Series. New Delhi: B. R. Publishing Corporation, 2008.
7. Macdougall, Alan F. and Prytherch, Ray, ed. Handbook of library cooperation. Mumbai: Jaico Publishing, 1997.



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8. Ranganathan, S. R. The five laws of Library Science. Bangalore: Sarada Ranganathan Endowment for Library Science, 1988.
9. Paslithil, A. Public library movement: Kerala. Delhi: Kalpaz Publications, 2006.
10. Sharma, S K. Libraries and Society. New Delhi: Ess Ess Publication, 1987

Management of Libraries and Information Centers

BLIS 02 Management of Libraries and Information Centers

Unit 1 Library Management

Concept of Management History of management thought
Principles of management -POSDCORB

Functions of management – MBO, TQM, MIS
Library and Information Centre Organization and Management

Unit 2 Housekeeping Operations

Acquisition: Collection Development: Selection, Ordering and Accessioning
Technical Processing: Classification, Cataloguing and Physical Processing of documents
Maintenance of Collection: Shelving, Rectification, Stock Verification, Binding and weeding out, care and preservation

Unit 3 Reader Services

Circulation of Documents: Issue of membership, charging systems Reference Collection, and service routines
Serials Control: Selection, ordering, recording the receipt and display of Documentation Services
Special Collections and services

Unit 4 Library Administrative Tools and Techniques



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Library Committee, Library rules, Staff Manual, Library Statistics, Annual Report

Unit 5 Library Budgeting

Methods of financial estimation, Sources of Finance, Types of Expenditure
Types of Budgets - Line budget, Performance budget, PPBS, ZBB

Reading list

1. Bryson, Jo. Effective library and information centre management. Hampshire,U. K.: Gower, 1990.
2. Bryson, Jo. Managing information services: A transformational approach. 2nd ed. Aldershot, UK: Ashgate Publishing, 2006.
3. Evans, G. Edward G. Management techniques for librarians. 2nd ed. New York: Academic Press, 1983.
4. Evans, G. Edward and Aire, Camila A. Management basics for information professionals. 3rd ed. London: Facet, 2013
5. Khanna, J. K. Handbook of library administration. New Delhi: Crest Publishing House, 2001.
6. Koontz, Harold and Weirich, Heinz Essentials of management: An international and leadership perspective. 9th ed. New Delhi: Tata McGraw-Hill, 2013.
7. Mittal, R. L. Library administration: Theory and Practice. 5th ed. New Delhi: Ess Ess Publications, 2007.
8. Principles of management. Retrievable from <http://www.saylor.org/site/textbooks/Principles%20of%20Management.pdf>
9. Ranganathan, S. R. Library administration. New Delhi: Ess Ess Publications, 2006.
10. Stueart, Robert D. and Moran, Barbara B. Library and Information Centre Management. Colorado: Libraries Unlimited, 2004.

Information Sources, Systems and Services

BLIS03 Information Sources, Systems and Services

Unit1 Physical Media of information

Evolution of physical media;
Classification of information sources – Print and non-print; Documentary and Non-Documentary;
Primary, Secondary and Tertiary Sources of Information -- their categories and characteristics.



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Unit 2 Ready Reference Sources: Print and Digital

Criteria for the evaluation of reference sources

Detailed Study of dictionaries, encyclopedias, yearbooks, directories, handbooks and manuals, biographical sources, geographical sources, statistical sources, sources of current information;

E-resources: E-books, E-journals, ETDs, Databases, Subject Gateways; Open Access Resources

Unit 3 Information Users and their Information Needs

Categories of information users; Information needs, definition; Types and models; Information seeking behavior; User studies, methods, technique and evaluation

Unit 4 Information Services

Reference service – Types and steps; Reference interview; Virtual Reference Service; Referral service

Other services: CAS, SDI, Document Delivery, Abstracting and Indexing services; Translation, Reprography

Unit 5 Information Systems and their Services

Study of national, International Systems and Services: NISCAIR, , DESIDOC, NASSDOC, SENDOC, AGRIS, CAS, BIOSIS, ERIC, INIS, INSPEC, MEDLARS, OCLC, Thomson Reuters, ProQuest, Ebsco

Record of Term Work:

Evaluation of not less than 50 reference sources including electronic sources.

Reading list

1. Bopp, Richard E. and Smith, Linda C. Reference and information services: An introduction, 4th ed. Libraries Unlimited, 2011.
2. Cassel, Kay Ann and Hiremath, Uma. Reference and information services: An introduction, 3rd ed. London: Facet Publishing, 2013.
3. Gurdev Singh. Information Sources, Services and Systems. New Delhi: PHI Learning, 2013



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. Hurt, C. D. Information Sources in Science and Technology. 3rd ed. Westport, Conn.: Libraries Unlimited, 1998.
5. Katz, William A. Introduction to reference work, 7thed. New York: McGraw Hill, 1997.
6. Krishan Kumar. Reference service, 5thed. New Delhi: Vikas Publishing House, 2004.
7. Ranganathan, S. R. Reference Service. 2nd ed. Bombay: Asia Pub. House, 1961.
8. Sewa Singh. Manual of reference and information sources. New Delhi: B R. Publishing, 2004.
9. Stebbins, Leslie, F. Student guide to research in the digital age: how to locate and evaluate information sources. Santa Barbara: Libraries Unlimited, 2005
10. Webb, William H. et al. Sources of information with social sciences. 3rded. Chicago: ALA, 1986.

Project Work and ViVa

BLIS 10 Project Work and ViVa

Students have to carry out project works under the guidance of a faculty member and prepare reports. The students should also appear for a viva-voce.

Project Work

- Evaluation of 30 Reference Sources – 20 marks
- 50 Fact Finding of Information Queries from different authentic sources -10 marks
- Compilation of Bibliography on a selected topic (Using MLA/APA) -10 marks
- Study Tour Report -10 marks

Viva Voce

Viva -voce based on course -50marks

Advanced Data Structures

CSS1C02 Advanced Data Structures

Unit I:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Data structure - definition - types & operations, characteristics of data structures -Abstract Data Type (ADT) – algorithms - concepts - definition - objectives of algorithms -quality of an algorithm - space complexity and time complexity of an algorithm.

Unit II:

Counting Techniques: Basic counting techniques - permutations and combinations, asymptotic behavior of functions. Linear data structures - Arrays - records -representation - data structure operations - traversing, inserting and deleting - sorting and searching - sorting algorithms - linear search & binary search - complexity. Linked lists -operations and implementations, - Stack - operations and its implementations (both array and linked list) - Applications - parsing arithmetic expressions, conversion and evaluating

expressions. Recursion - characteristics of recursion, types of recursion applications of recursion in algorithms - comparison of recursive and non-recursive algorithms. Queue -operations and its implementations (both array and linked list) - circular queue - dequeue -priority queues, recursive lists, heterogeneous lists, deterministic skip lists, doubly linked lists and circular lists sparse matrix-representation.

Unit III:

Non-linear Data Structures - trees - terminology - tree traversals algorithms -Binary trees - threaded binary trees - binary search trees - traversals and operations on BSTheap Tree - balanced trees - M-way trees - B and B+ trees, Red Black Tree, Digital Search Tree, Tries, Treaps, Huffman algorithm for extended binary tree - operations and their implementation. Graphs - representation of graphs – operations - traversals and their implementation.

Unit IV:

Hashing - overview of hashing - hash tables - hash functions and their computations open addressing - linear probing - quadratic probing - double hashing algorithms and their implementations - rehashing - extendable hashing - separate chaining -hashing efficiency - heaps - overview of heaps - implementation and operations.

Unit V:

Heap structures - Min-Max heaps - Deaps - leftist heaps - binomial heaps - Fibonacci heaps -binary heaps - skew heaps - pairing heaps - applications - amortized analysisan unrelated puzzle - Binomial queues - skew heaps - Fibonacci heaps - Splay trees.

References:

1. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, Data Structures and



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Algorithms, Addison-Wesley, ISBN: 978-0201000238.

2. Horowitz E and Sahni S, Fundamentals of Data Structures, Computer Science Press, ISBN: 9780716780427.

3. Ellis Horowitz, Sartaj Sahni and Susan Anderson-Freed, Fundamentals of Data Structures in C, Silicon Press, ISBN: 0929306406.

4. Richard F. Gilberg and Behrouz A. Forouzan, Data Structures: A Pseudocode Approach With C, Thomson Brooks/Cole Publications, Course Technology, ISBN: 9780534390808.

5. Aaron M. Tenenbaum, Yedidyah Langsam and Moshe J. Augenstein, Data Structure using C, Prentice- Hall, ISBN: 9780131997462.

6. Robert Kruse, Tondo C L and Bruce Leung, Data Structures & Program Design in C, Pearson India, 2nd Edition, ISBN: 9788177584233.

7. U. A. Deshpande and O. G. Kakde, Data Structures & Algorithms, ISTE Learning Materials Centre, New Delhi, ISBN: 9788188057054.

8. Thomas H Cormen, Charles E Leiserson, and Ronald L Rivest, Introduction to Algorithms, 3rd Edition, Prentice Hall of India Private Limited, New Delhi, ISBN: 978-0262033848.

9. Seymour Lipschutz, Data Structures With C, 1st Edition, Tata Mcgraw Hill Education Private Limited, ISBN: 0070701989.

10. Jean-Paul Tremblay, Paul G. Sorenson, P. G. Sorenson, Introduction to Data Structures with Applications, 2nd Edition, Mcgraw-Hill College, ISBN: 0070651574.

Theory of Computation

CSS1C03 Theory of Computation



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Unit I:

Preliminaries - Introduction to formal proof and inductive proofs - The central concepts of Automata Theory - Alphabets, Strings, Languages - Introduction to automata and grammar - Deterministic Finite Automata, Non-deterministic Finite Automata -Equivalence of Deterministic and Nondeterministic Finite Automata - Finite Automata with Epsilon Transitions - Equivalence of NFA with and without epsilon moves.

Unit II:

Regular Expressions, Finite Automata and Regular Expressions, Properties of Regular Languages - Pumping lemma and proof for existence of non-regular languages, Closure properties, homomorphism, substitution - Decision Properties - Equivalence and Myhill Nerode and DFA state minimization - Regular Grammar.

Unit III:

Context Free Languages - Equivalence of CFG and PDA - Normal forms (CNF and GNF) - Closure properties of CFL's - DCFL's and their properties - Decision procedures - CYK algorithm - Pumping lemma and proof for existence of non-context - free languages - Context sensitive languages: Equivalence of LBA and Context Sensitive Grammar (CSG).

Unit IV:

Turing machines - TM computations - Equivalence of standard TM with multi tape and non deterministic TM's - Turing acceptable, Turing decidable and Turing enumerable language classes - Equivalence of type 0 grammars with TM's - Church thesis -Chomsky hierarchy - Closure properties of recursive and recursively enumerable languages.

Unit V:

Computability and Decidability - halting problem - reductions - post correspondence problem. Computational complexity - Time and space bounded simulations - Classes P and NP - NP completeness - Cook's theorem.

References:

1. John E. Hopcroft, Rajeev Motwani, Jeffrey D. Ullman, Introduction to Automata Theory, Languages of Computation, 3rd Edition, Prentice Hall, ISBN: 0321455363.
2. Linz P, An Introduction to Formal Languages and Automata, Narosa Publishing House Pvt. Ltd., New Delhi, ISBN: 9788173197819.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Michael Sipser, Introduction to Theory of Computation, Cengage Learning India Private Limited, Indian Edition, ISBN: 8131505138.

4. H.R. Lewis and C.H. Papadimitriou, Elements of Theory of Computation, 2nd Edition, Prentice Hall, ISBN: 0132624788.

5. J. E. Savage, Models of Computation, Exploring the Power of Computing, Addison Wesley, 1998, Available at <http://cs.brown.edu/~jes/book/>.

6. Martin J.C, Introduction to Languages and Theory of Computation, Tata McGraw Hill, 3rd Edition, ISBN: 9780070660489

The Art of Programming Methodology

CSS1C04 The Art of Programming Methodology

Unit I:

Part A: Problem Solving - Flow Chart for Structured Programming - Program

Charts System Charts - Variables, data names, programming statements - Flow Chart Symbols - Terminal Symbols - I/O - Comments - Connectors - Process - Decision - Loops - Flow Charts of Fundamental Algorithms (mentioned in Part B). Part B: Algorithm Design - Problem Solving Aspect - Top down Design - Formal Conventions Writing Algorithms -Fundamental Algorithms (Discuss the Design of Algorithms only). Part C: Program, Characteristics of a good program - **Modular Approach - Programming style - Documentation and Program Maintenance - Compilers and Interpreters - Running and Debugging Programs - Syntax Errors - Run-Time Errors - Logical Errors - Concept of Structured Programming.**

Unit II:

Introduction to C Programming - overview and importance of C - C Program

Structure and Simple programs - Creation and Compilation of C Programs under Linux and Windows Platforms. Elements of C Language and Program constructs - structure of C program - character set, tokens, keywords, identifier - Data types, constants, symbolic constants, variables, declaration, data input and output, assignment statements. Operators in C - arithmetic operators, relational



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operators, logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, precedence of operators - arithmetic expressions - evaluation of expressions, type conversion in expressions - precedence and associativity - mathematical functions - I/O operations.

Unit III:

Decision making - if statement, if else statement, nesting of if else and else if ladder, switch statement, break statement, continue statement, goto statement, return statement. looping - while, do-while, and for loops, nesting of loops, skipping & breaking loops. Arrays - single dimension arrays - accessing array elements - initializing an array, two dimensional & multi-dimensional arrays - memory representation - strings - processing of strings - string manipulation functions.

Unit IV:

The Concept of modularization - defining function - types of functions - User defined functions - function prototype and definition - arguments - passing parameters - call by reference - call by value - returning - nesting of functions and recursion - passing arrays & strings to function - returning multiple values - recursion - scope and life time of variables storage class specifiers - automatic, extern, static storage, register storage. Structures & Union definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures

and functions, Unions, bit-fields.

Unit V:

Pointer - pointer operator - pointer expression - declaration of pointer - initializing pointer - de-referencing - pointer to pointer, constant pointer, array of pointers, pointer to function. Files - file handling - defining & opening a file - closing a file - Input/output operations on files - error handling, random access to files, command line arguments -dynamic memory allocation - linked lists (concepts only) - preprocessor directives: macro substitution directives - simple macros - macros with arguments - nesting of macros, compiler control directives.

References:

1. Martin M. Lipschutz and Seymour Lipschutz, Schaum's Outline of Theory and Problems of Data Processing, ISBN: 9780070379831 (Unit I Part A).
2. Anil Bikas Chaudhuri, The Art Of Programming Through Flowcharts & Algorithms, Laxmi Publications, New Delhi (Unit I Part A).
3. Jean Paul Trembley and Pual G Sorenson, An Introduction to Data Structures with Applications, Tata McGraw Hill (Unit I Part B).



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. R G Dromey, How to Solve by Computer, Pearson Education, 5th Edition, ISBN: 0134340019 (Unit I Part B).
5. J.B Dixit, Computer Fundamentals and Programming in C, Firewall Media, ISBN: 8170088828. (Unit I Part C).
6. Dennie Van Tassel, Program Style, Design, Efficiency, Debugging, and Testing, PHI, ISBN: 0137299478 (Unit I Part C).
7. E Balagruswamy, Programming in ANSI C, TMH, 5th Edition, ISBN: 0070681821.
8. Kamthane, Programming in C, 2nd Edition, Pearson India, ISBN: 8131760316.
9. Brian W. Kernighan and Dennis M. Ritchie, C Programming Language, PHI, ISBN: 0131103628.
10. Kanetkar, Let Us C, BPB Publications, 8th Edition, ISBN: 1934015253.

Introduction To Research (Ability Enhancement Audit Course)

CSS1A01 – Introduction to Research (Ability Enhancement Audit Course)

Objectives: Large numbers of students are actively considering and taking up research and associated higher studies. An introductory course on research aims to introduce students to the important aspects of research. The intent of such a course is to make students aware of

the details associated with formal research. By going through this introductory course on research, students are likely to be able to take up research activities in a more systematic and formal manner right from the beginning. The specific objectives of the course include:

- ♣ Understand research terminology
- ♣ Be aware of the ethical principles of research
- ♣ Identify the components of a literature review process
- ♣ Critically analyse published research
- ♣ To introduce research methods in the field of computer Science

Course Evaluation & Course Credit

The Ability Enhancement Audit Course has 4 credits which will not be counted for evaluating the overall SGPA & CGPA. The College/Department shall conduct examination of 2 Hrs duration with a minimum



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of 20 weightage before the conclusion of first semester classes and have to intimate /upload the results of the same to the University on the stipulated date during the III Semester. Students have to obtain only minimum pass requirements in this Audit Course.

Course Delivery Mode

This course is an Ability Enhancement Audit Course. The course content is not delivered in the classrooms. Instead, the students have enrol themselves for the online course offered at NPTEL. The online course is available at <https://nptel.ac.in/courses/121106007/>. Students can either view the video module online or can download the video lessons and transcripts to view or read them offline. Course Outline The students are encouraged to cover the following modules of the course Introduction to

Research from NPTEL:

♣ **Week1: Overview of Research**

♣ **Week2: Overview of Literature Survey: Literature Survey using Web of Science,**

Literature Survey using Scopus, Writing Up, Tutorial on using BibTeX with LaTeX to add references to a document, Tutorial on using Microsoft Word with Bibliographic Sources, Tutorial on using Microsoft Word with endnote entries

♣ Week3: Data Analysis

♣ Week4: How to make Technical presentation – Technical Writing

♣ Week 6: Intellectual property

♣ Week8: Research in Computer Science & Engineering

References:

1. Video Lessons and Transcripts available (including in the regional language) at https://nptel.ac.in/courses/nptel_download.php?subjectid=121106007

Design and Analysis of Algorithms

CSS2C06 Design and Analysis of Algorithms

Unit I:

Algorithm Design: Introduction, Steps in developing algorithm, Methods of specifying an algorithm, Decisions prior to designing: based on the capabilities of the device, based on the nature of solutions, based on the most suitable data structures. Model of Computation: RAM model and PRAM model. Important Problem Types (Introductory concepts): Sorting, Searching, String processing, Graph problems, Combinatorial problems, Geometric problems and Numerical problems.

Unit II:



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Basic Technique for Design of Efficient Algorithm: Brute Force approach (String matching), Divide-and-Conquer approach (Merge sort), Branch-and-Bound technique (Knapsack problem). Greedy approach (Kruskal's algorithm and Prim's Algorithm), Dynamic Programming (Longest Common Subsequence), Backtracking (Sum of subsets problem).

Unit III:

Algorithm Analysis: Importance of algorithm analysis, Time and Space

Complexity. Growth of Functions: Asymptotic notations, Cost estimation based on key operations- Big Oh, Big Omega, Little Oh, Little Omega and Theta notations, Big Oh Ratio Theorem, Big Theta Ratio Theorem, Big Omega Ratio Theorem. Analyzing Algorithm Control Structures, Solving Recurrences: Iteration Method, Substitution Method, The Recursion Tree Method, Master's Theorem, Problem solving using Master's Theorem Case 1, Case 2 and Case 3. Analysis of Strasser's algorithm for matrix multiplication, Analysis of Merge sort.

Unit IV:

Complexity - Complexity Classes: P, NP, NP Hard and NP Complete problems.

NP Completeness reductions for Travelling Salesman Problem and Hamiltonian Cycle. P versus NP problem.

Unit V:

Analysing Parallel Algorithms: Time Complexity, Cost, Number of Processors,

Space Complexity, Speed up, Efficiency, Scalability, Amdahl's Law. Parallel merging and sorting, Euler tour technique, Parallel prefix computation, Deterministic symmetry breaking.

References:

1. Thomas H Cormen, Charles E Leiserson, and Ronald L Rivest, Introduction to Algorithms, 3rd Edition, Prentice Hall of India Private Limited, New Delhi, ISBN: 9780262033848 (Unit I, II, III and IV).
2. Alfred V. Aho, John E. Hopcroft and Jeffrey D. Ullman, The Design and Analysis of Computer Algorithms, 1st Edition. Addison Wesley, ISBN: 0534915728 (Unit I, II, III and IV).
3. Pallaw, V K, Design and Analysis of Algorithms, Asian Books Private Ltd, 2012, ISBN:



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8184121687 (Unit I, II, III and IV).

4. Sanjay Razdan, Fundamentals of Parallel Computing, Narosa Publishing House, 2014, ISBN: 9788184873481 (Unit V).

5. Pandey H M, Design and Analysis of Algorithms, University Science Press, 2013, ISBN: 9788131803349 (Unit I, II, III and IV).

6. Upadhyay N, Design and Analysis of Algorithms, SK Kataria & Sons, 2008 (Unit I, II, III and IV).

7. U. Manber, Introduction to Algorithms: A Creative Approach, Addison Wesley, ISBN: 9780201003277 (Unit I, II, III and IV).

8. Gilles Brassard and Paul Bratley, Fundamentals of Algorithmics, Prentice-Hall of India, ISBN: 0133350681 (Unit I, II, III and IV).

9. Goodman S E and Hedetniemi, Introduction to the Design and Analysis of Algorithms, Mcgraw Hill, ISBN: 0070237530 (Unit I, II, III and IV).

10. Horowitz E and Sahni S, Fundamentals of Computer Algorithms, Galgotia Publications Pvt. Ltd, ISBN: 8175152575 (Unit I, II, III and IV).

11. Oded Goldreich, P, NP and NP - Completeness, Cambridge University Press, 2011. ISBN: 0521122546 (Unit V).

12. Donald Knuth, The Art of Computer Programming, Fundamental Algorithms, Volume 1, Addison Wesley, 1997, ISBN: 8177587544 (Unit I).

13. Sanjeev Arora and Boaz Borak, Computational Complexity - A Modern Approach, Cambridge University Press; 2009, ISBN: 0521424267 (Unit III).

14. Daniel Hills W and Bruce M Boghosian, Parallel Scientific Computation, Science, 13 August 1993, Vol. 261 (5123), pp.856-863 (Unit V)



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Computer Networks

CSS2C08 Computer Networks

Unit I:

Introduction to Computer networks - introduction - topology - categories of

networks Internetwork - Internet - network modes- layered model - OSI and TCP/IP Models Transmission media - Wired and unwired media. Computer networks and Internet - the network edge - the network core - network access - delay and loss - protocol layers and services - history of computer networking and Internet.

Unit II:

Application layer protocols – principles – the web and HTTP – FTP – Email in

Internet – DNS. Socket programming – building a Web server - content distribution.

Unit III:

Transport layer services – introduction – relationship between Transport and

Network layer – UDP – reliable data transfer – TCP - congestion control - Network layer services – routing – IP - routing in Internet - router - IPV6 - multicast routing – mobility.

Unit IV:

Link layer services - error detection and correction - multiple access protocols –LAN address – ARP – Ethernet – hubs – bridges – switches - wireless links – PPP - ATM.

Unit V:

Security in Networks – Principles of Cryptography – Authentication – Integrity –Key Distribution and Certification – Firewalls – Attacks and Counter Measures.

References:

1. J. F. Kurose and K. W. Ross, Computer Networking: A Top-Down Approach Featuring

Internet, 6th Edition, Perason Education, ISBN: 0132856204.

2. Behrouz Forouzan, Data Communications and Networking, 4th Edition, McGrawHill Reprint, ISBN: 0073250325.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Peterson L.L. and Davie B .S., Computer Networks, A Systems Approach, 5th Edition, Morgan Kaufmann, ISBN: 9780123850591.

4. Keshav, An Engineering Approach to Computer Networking, Pearson Education Asia, ISBN: 97898123598652000.

5. Andrew S. Tanenbaum, Computer Networks, 5th Edition, PHI, ISBN: 9788131787571.

6. Herbert Scheldt, Java Complete Reference, 7th Edition, McGraw-Hill Osborne Media, ISBN: 9780072263855.

Computational Intelligence

CSS2C09 – Computational Intelligence

Unit I:

Introduction - Artificial Intelligence - problems, scope and applications, problem space and search - production system- characteristics - the predicate calculus, inference rules, structures and strategies for state space search, strategies for space search, using state space to represent reasoning with the predicate calculus.

Unit II:

Heuristics Search: control and implementation of state space search, generate and test, hill climbing, Best-first search, problem reduction, constraint satisfaction, means- ends analysis, heuristic in games, complexity issues.

Unit III:

Knowledge representation issues, representation and mappings, representing

simple facts in logic, representing instances and ISA relationships, computable functions and predicates, resolution, natural deduction, knowledge representation using rules, logic programming, forward versus backward reasoning, symbolic reasoning under uncertainty non-monotonic reasoning, depth first search, breadth first search.

Unit IV:



CRITERION	I	Curricular Aspects
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Game playing - the mini-max search procedure, adding alpha-beta cut-offs,

additional refinement, iterative deepening, planning system and its components,

understanding, understanding as constrained satisfaction. Slot and filler structures: semantic nets, frames, conceptual dependency, scripts. Definition and characteristics of expert system,

representing and using domain knowledge, expert system shells. Knowledge engineering, knowledge acquisition, expert system life cycle & expert system tools, MYCIN & DENDRAL examples of expert system.

Unit V:

Machine learning - rote learning, learning by taking advice, learning in problem

solving, learning from examples, explanation based learning, analogy, formal learning theory, connectionist models - hopfield networks, learning in neural networks, back propagation, the genetic algorithm, classifier systems and genetic programming, artificial life and society based learning.

References:

1. Elaine Rich, Kevin Knight and Shivshankar B. Nair, Artificial Intelligence, 3rd Edition, Tata - McGraw Hill, New Delhi, ISBN: 0070087709.
2. V S Janakiraman, K Sarukesi and P Gopalakrishnan, Foundations of Artificial Intelligence and Expert System, Macmillan India Limited, ISBN: 0333926250.
3. Stuart Russell and Peter Norvg, Artificial Intelligence: A Modern Approach, 3rd Edition, Prentice Hall, ISBN: 0136042597.'
4. G. F. Luger and W.A Stubblefield, Artificial Intelligence - Structures and Strategies for Complex Problem Solving, Addison-Wesley, 6th Edition, ISBN: 9780321545893.
5. P. H. Winston, Artificial Intelligence, Addison-Wesley, 3rd Edition, ISBN: 0201533774.
6. Nils J. Nilsson, Artificial Intelligence, A New Synthesis, 1st Edition, Morgan Kaufmann Publishers, Inc, ISBN: 1558604677

Term Paper (Professional Competency Audit Course)

CSS2A02 – Term Paper (Professional Competency Audit Course)

Objectives:

- ♣ To introduce the student to the techniques of literature survey.
- ♣ To acquaint him/her with the process of presenting his/her work through seminars and technical reports.



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The student is expected to do an extensive literature survey and analysis in an area related to computer science, chosen by him/her, under the supervision of a faculty member from the department. The student has to choose an area for his/her work after due consultation and approval from the guide. The study should preferably result in a critical review of the present works/design ideas/designs/algorithms/theoretical contributions in the form of theorems and

proofs/new methods of proof/new techniques or heuristics with analytical studies/implementations and analysis of results.

The student should give a seminar on his/her work, during the semester, and submit a technical report. Technical report should be prepared in TEX in IEEE conference style format.

Course Delivery Mode

Students be given choice to opt for the supervisor according to his/her area of interest. The

Department council will finally decide and distribute the students among the faculty members by accommodating the choice and interest of the students, as far as possible. The faculty in charge must give proper directions and guidance to the students in carrying out the literature review effectively and systematically.

Course Evaluation & Course Credit

The Professional Competency Audit Course has 4 credits which will not be counted for evaluating the overall SGPA & CGPA. The Department shall conduct the final evaluation of the course based on the following criteria and have to intimate /upload the results of the same to the University on the stipulated date during the III Semester. Component Weightage Publication of the Review Paper in a UGC Listed, Peer Reviewed or other peer

reviewed refereed Journals20% (Maximum weightage be given to UGC listed Journal and weightage be reduced in other cases)Presentation in an International/ National/Regional Conference20% (Maximum weightage be given to International Conferences with Proceeding having ISBN and weightage be reduced in other cases)Quality of the Technical Report 40%Quality and Effectiveness of the Report Presentation20%Students have to obtain only minimum pass requirements in this Audit Course.

References:

Articles from ACM/IEEE/INFLIBNET Journals/Conference Proceedings and/or equivalent documents, standard textbooks and web based material, approved by the supervisor



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Advanced Database Management System

CSS3C11 Advanced Database Management System

Unit I:

Introduction - purpose of database systems, views of data - data abstraction, instances and schemas, data independence, data models - hierarchical data model, network data model, relational data model, ER d&t9,mg9lei. Database languages - DDL, DML, transaction management, storage management, database administrator, database users, overall system structure. Relational data model - relational model concepts, keys, integrity constraints - domain constraints, key constraints, entity integrity constraints, referential integrity constraints. ER data model - basic concepts, constraints, keys, design issues, entity relationship diagram, weak entity sets, extended ER features, design of an ER database schema, reduction of an ER schema to tables. Relational algebra and calculus - relational algebra - selection and projection, set operations, renaming, joins, division. Relational

calculus - tuple relational calculus, domain relational calculus. Expressive power of algebra and calculus.

Unit II:

Relational database design - anomalies in a database - functional dependency -

lossless join and dependency-preserving decomposition - normalization - normal forms -first, second and third normal form - Boyce Codd normal form - multivalued, dependency - fourth normal form - join dependency - project join normal form - domain key normal form.

Unit III:

Relational database query languages - basics of QBE and SQL. Data definition in SQL data types, creation, insertion, viewing, updation, deletion of tables, modifying the structure of the tables, renaming, dropping of tables. Data constraints - I/O constraints, primary key, foreign key, unique key constraints, ALTER TABLE command database manipulation in SQL - computations done on table data - SELECT command, logical operators, range searching, pattern matching, grouping data from tables in SQL, GROUP BY, HAVING clauses. Joins - joining multiple tables, joining a table to it. DELETE -UPDATE. Views - creation, renaming the column of a view, destroys view. Program with SQL - data types Using SET and SELECT commands, procedural flow, IF, IF /ELSE,

WHILE, GOTO, global variables. Security - locks, types of locks, levels of locks. Cursors -working with cursors, error handling, developing stored procedures, CREATE, ALTER and DROP, passing and



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returning data to stored procedures, using stored procedures within queries, building user defined functions, creating and calling a scalar function, implementing triggers, creating triggers, multiple trigger interaction (Use MySQL as the RDBMS).

Unit IV:

Transaction management, concurrency control and query processing - concept,

definition and states of transactions, ACID properties - concurrency control, serializability -conflict serializability, view serializability, recoverability-recoverable schedules, noncascading schedules, strict schedules. Concurrency control schemes - locking- two phase locking, deadlock, granularity, timestamp ordering protocol. Basics of query processing.

Unit V:

Object Oriented Database Management Systems (OODBMS) - concepts, need for OODBMS, composite objects, issues in OODBMSs, advantages and

disadvantages of OODBMS. Distributed databases - motivation - distributed database concepts, types of distribution, architecture of distributed databases, the design of distributed databases, distributed transactions, commit protocols for distributed databases.

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1. Elmasri and Navathe, Fundamentals of Database Systems, 5th Edition, Pearson, ISBN: 9788131758984.
2. Abraham Silbersehatz, Henry F. Korth and S.Sudarshan, Database System Concepts, 6th Edition, Tata McGraw-Hill, ISBN: 0071325220.
3. CJ Date, An Introduction to Database Systems, 8th Edition, Addison Wesley, ISBN: 0321197844.
4. Ramakrishnan and Gehrke, Database Management Systems, 3rd Edition, McGraw - Hill Education, ISBN: 9339213114.
5. Alexis Leon and Mathews Leon, Database Management Systems, 1st Edition, Vikas Publishers, ISBN: 8182092221.
6. Vikram Vaswani, MySQL The complete Reference, 1st Edition, Tata Mcgraw Hill



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Education Private Limited, ISBN: 0070586845.

7. Joel Murach, Murach's Mysql, Mike Murach & Associates Inc, ISBN: 9350237695.

8. Paul DuBois, MySQL Cookbook, 2nd Edition, O'Reilly Media, ISBN: 8184042809.

Object Oriented Programming Concepts

CSS3C12 – Object Oriented Programming Concepts

Unit I:

Introduction to OOPS - basic principles of object orientation (objects , attributes

and methods, encapsulation and information hiding, state retention, object identity, messages, class hierarchy, inheritance, polymorphism, genericity) - introduction to Java -history, versioning, the Java Virtual Machine, byte code, features of Java, language components - primitive data types, comments, keywords, literals, variables scope & declarations, control structures - FOR, IF, WHILE, DO WHILE, SWITCH, BREAK, CONTINUE statements - operators - casts and conversions - arrays.

Unit II:

Object - oriented programming – classes - class fundamentals - declaring objects -new operator – methods – parameter passing – constructors - parameterized constructors -this keyword – finalize method. Overloading methods and constructors, access controls, static and final, nested and inner classes. Inheritance - extends, member access and inheritance, super keyword, polymorphism, method overriding, dynamic method dispatch, abstract classes, packages and interfaces.

Unit III:

Exceptions, threads & IO in Java - The file and standard streams, stream classes

and interfaces, using byte streams and character streams, threads - threads vs. processes, creating threads, runnable interface, thread class, inter thread communication, synchronization. Exceptions - basic of Java exception handling, hierarchy, developing user defined exception classes.

Unit IV:



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Applets, AWT & Swing - applet class, types of applet, skeleton, applet tag, passing parameters, event handling, delegation event model, event classes, listeners, AWT classes and window fundamentals, frames, working with fonts, graphics and colors, AWT controls, layouts and menus, dialogue boxes. Swings - Japplets, icon, labels, buttons, textbox, combo box, tables and panes.

Unit V:

Database and sockets - JDBC - introduction, architecture, drivers, connections, statements, resultset and meta data (Use MySQL as the RDBMS). Sockets: introduction to networking, InetAddress, url, socket, server sockets, datagrams.

Introduction to Unified Modelling Language (UML), UML diagrams, class diagrams, object interaction diagrams, state and activity diagrams, component diagrams, deployment diagrams. Introduction to analysis - object oriented system analysis, design and implementations.

References

1. Herbert Scheldt, Java Complete Reference, 8th Edition, Tata Mcgraw Hill Education Private Limited, ISBN: 1259002462.
2. E Balaguruswamy, Programming in Java: A Primer, 4th Edition, Tata Mcgraw Hill Education Private Limited, ISBN: 007014169X.
3. Kathy Sierra, Head First Java, 2nd Edition, Shroff Publishers and Distributors Pvt Ltd, ISBN: 8173666024.
4. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, Java Enterprise MSc Computer Science (Academic Year 2019-20 Onwards)
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in a Nutshell: A Desktop Quick Reference, 3rd Edition, O'Reilly Media, ISBN: 0596101422.
5. Grady Booch, James Rumbaugh and Ivar Jacobson, The Unified Modeling Language User Guide, 2nd Edition, Pearson, ISBN: 8131715825.



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Computer Graphics

CSS3E01a – Computer Graphics

Unit I:

Introduction – Application of computer graphics, Video Display Devices- refresh CRT, raster and random scan display, color CRT, flat panel, LCD, LED, DVST. Raster -Scan Systems-video controller, display processor, Random-Scan Systems.

Unit II:

2D Graphics: Line drawing algorithms – DDA, Bresenham’s – Midpoint Circle

drawing algorithm –Filling-Scan line polygon fill algorithm, boundary fill algorithm, floodfill algorithm, 2D Transformations-translation, rotation, scaling, shearing and reflection, composite transformations. 2D Viewing –the viewing pipeline, viewing coordinate reference frame, window-to- viewport coordinate transformation. Clipping-pointclipping, Cohen Sutherland line clipping, Sutherland Hodgeman polygon clipping, textclipping.

Unit III:

3D Graphics: 3D Transformations- translation, rotation, scaling, shearing and

reflection,3D Viewing-viewing pipeline, viewing coordinates, projections- parallel & perspective projections.

Unit IV:

3D object representation - wireframe model, curve representation, surfaces, spline representation, bezier curves, cubic spline. Visible surface detection methods- classification, back-face detection, Z-buffer algorithm.

Unit V:

Discrete Techniques and OpenGL programming - Texture mapping, Bit and Pixel operations, Compositing, Sampling and Aliasing Techniques. Introduction to OpenGL, Features in OpenGL, OpenGL operations, Abstractions in OpenGL - GL, GLU & GLUT, a few examples of OpenGL programs.

References:

1. Donald Hearn and M. Pauline Baker, Computer Graphics, 2nd Edition, Prentice Hall, ISBN: 0135309247.



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2. Donald D. Hearn, M. Pauline Baker and Warren Carithers, Computer Graphics with Open GL, 4th Edition, Prentice Hall, ISBN: 9780136053583.

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3. Hill, Computer Graphics using OpenGL, 3rd Edition, Prentice Hall of India Private Ltd. New Delhi, ISBN: 8120338294.

4. Mason Woo, Jackie Neider, Tom Davis, Dave Shreiner, Dave Shriner and Tom David, Open GL Programming Guide, 6th Edition, Person, ISBN: 9780201604580.

5. The Official Guide to Learning OpenGL, Version 1.1, Available at <http://www.glprogramming.com/red/>.

6. Shreiner and Angel, Interactive Computer Graphics: A Top-Down Approach with Shader-Based OpenGL, 6th Edition, Pearson Education, ISBN: 0132545233.

Web Technology

CSS3E01C– Web Technology

unit I:

Introduction to web programming - introduction to SGML features - HTML,

XHTML, DHTML, XML - HTML Vs XML - creating XML documents - parsing an XML document writing well-formed documents - organizing elements with namespaces - defining elements in a DTD - declaring elements and attributes in a DTD. Overview of HTML basic formatting tags - heading, paragraph, underline break, bold, italic, underline, superscript, subscript, font and image. Attributes -



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align, color, bgcolor, font face, border, size. Navigation links using anchor tag - internal, external, mail and image links. Lists - ordered,

unordered and definition, table tag, HTML form controls - form, text, password, textarea, button, checkbox, radio button, select box, hidden controls, frameset and frames. CSS.

Unit II:

Client side programming – introduction – popular client side scripting languages - Java Script - introduction, identifiers, operators, functions, event handling, classes, objects,

array, math, string, window object, navigator DHTML font, text, image change, tableexpansion. JavaScript’s object model- strengths and weaknesses of JavaScript - building and extending objects in JavaScript - events in JavaScript - event handlers - creating interactive forms – cookies - storing users choices in cookies - encoding cookies - browser objects - object hierarchy, creating browser objects, working with window, document, history & location -browser detection, Java to JavaScript communication.

Unit III:

Web server – role - Apache web server – introduction – architecture – features -

Apache's role in the Internet – LAMP – WAMP - installation and configuration - build and install Apache web server - verify initial configuration start, stop, and status the Apache server process. Configure Apache core modules security - basic security with Apache - host-based authentication - user-based authentication - secure sockets layer (SSL) - delivering dynamic web content - Apache's role in the dynamic web - server side includes (SSIs) - configure Apache web server to support CGI – CGI Alternative Technologies. virtual hosts, redirection, indexing – virtual hosting with Apache, virtual host configuration redirection, directory indexing. Proxy servers and firewalls - apache proxy configuring, proxy services firewalls and apache, firewall architecture models monitoring apache web server - error logs, logging http access, web server status and server information, user tracking - proxy caching.

Unit IV:

Server side programming – server side scripts – PHP – designing dynamic web pages using PHP - defining PHP variables – variable types – operators – control flowconstructs in PHP – passing form data between pages - establishing connection with MySQL database – managing database.

Unit V:

Overview of content management system - coding for reusability (header.php) –

user management - article publishing - additional CMS features – Web site developmentusing Joomla!.



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1. Thomas A. Powell, The Complete Reference HTML, 3rd Edition, McGrawHill/Osborne Media, ISBN: 0072129514.
2. Thomas A. Powell, Web Design: The Complete Reference, 2nd Sub-Edition, McGrawHill/Osborne Media, ISBN: 0072119772
3. Robert W. Sebesta, Programming with World Wide Web, 7th Edition, AddisonWesley, ISBN: 9780132665810.
1. Xue Bai, Michael Ekedahl, Joyce Farrell, Don Gosselin, Diane Zak, Bill Morrissey, Michael V. Ekedahl, Peter Macintyre and Shashi Kaparathi, The Web Warrior Guide to Web programming, Thomson Learning, ISBN: 9780619064587.
4. Chris Bates, Web Programming: Building Internet Applications, 3rd Edition, Wiley Academic Catalog, ISBN: 9780470017753.
5. Paul J. Deitel, Harvey M. Deitel, Harvey Deitel, Paul Deitel and Abbey Deitel, Internet and World Wide Web: How to Program, 5th Edition, Prentice Hall, ISBN: 9780132151009.
6. R. Allen Wyke and Richard Wagner, JavaScript Unleashed, 3rd Edition, SAMS, ISBN: 9780672317637.
7. Richard Bowen Ken Coar, Ken A Coar and Matthew Marlowe, Apache Server Unleashed, SAMS, ISBN: 0672318083.
8. Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jeremy Stolz and Michael K Glass, Beginning PHP5, Apache, and MySQL Web Development, Wrox, ISBN: 0764579665.
9. Jennifer Marriott and Elin Waring, The Official Joomla! Book, Addison-Wesley Professional, ISBN: 978-0321821546.
10. Ron Severdia and Kenneth Crowder, Using Joomla: Building Powerful and Efficient Web Sites, 1st Edition, O'Reilly Media, ISBN: 9780596804947



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Bioinformatics

CSS3E01d – Bioinformatics

Unit I:

Bioinformatics - introduction to - nature and scope of computational biology and Bioinformatics. Cells - prokaryotes and eukaryotes - DNA double helix - central dogma -RNA, Amino acids, Proteins - string representations. A glossary of Bioinformatics terms -file format for bio-molecular sequences, sequence alignment, phylogeny, gene finding, microarray analysis, homology and evolutionary relationships.

Unit II:

Basic algorithms in Computational Biology - exhaustive search methods and their applications in Computational Biology - string matching algorithms. Motif finding - tandem repeats - concept of dynamic programming - graph algorithms - clustering algorithms.

Unit III:

Sequence alignment - pair-wise sequence alignment, need of scoring schemes - penalizing gaps, scoring matrices for amino acid sequence alignment, PAM probability matrix and log odds matrix, BLOSUM, Dot-plot visualization, Needleman- Wunsch algorithm- effect of scoring schemes - evaluates - BLAST and FASTA, Smith - Waterman algorithm for local alignment.

Unit IV:

Multiple sequence alignment - sequence alignment using dynamic programming, Ndimensional dynamic programming. Tools for MSA - muscle and T-Coffee. Phylogeneticalgorithms - evaluation of phylogenetic trees, significance.

Unit V:

Introduction to the major resources - NCBI, EBI and ExPASy - nucleic acid sequence databases - GenBank, EMBL, DDBJ – Protein sequence databases - SWISSPROT, TrEMBL, PIR_PSD - genome databases at NCBI, EBI, TIGR, SANGER –procedures to access these databases and to make use of the tools available.

References:

1. Mount D, Bioinformatics; Sequence & Genome Analysis, 2nd Edition, Cold spring Harbor Press, ISBN: 978-087969712.



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2. Dan Gusfield, Algorithms on Strings Trees and Sequences, 1st Edition, Cambridge University Press, ISBN: 0521585198.
3. Pevzner P A, Computational Molecular Biology: An Algorithmic Approach, MIT Press, Cambridge, MA, ISBN: ISBN: 9780262161978.
4. Jeremy J. Ramsden, Bioinformatics: An Introduction, Springer, ISBN: 9789401570961.
5. Sushmita M and Tinku A, Data Mining: Multimedia, Soft Computing and Bioinformatics, Wiley-Interscience, ISBN: 9780471460541.
6. Richard M. Karp, Mathematical Challenges from Genomics and Molecular Biology, Notices of the American Mathematical Society, vol. 49, no. 5, pp. 544-553.
7. Glyn Moody, Digital Code of Life: How Bioinformatics is Revolutionizing Science, Medicine and Business, ISBN: 9780471327882.
8. Tao Jiang, Ying Xu and Michael Q. Zhang, Current Topics in Computational Molecular Biology Edible OH Processing, 1st Edition, Ane Books Pvt Ltd, ISBN: 9788180520525.
9. Andrzej K. Konopka and M. James C. Crabbe, Compact Handbook of Computational Biology, 1st Edition, CRC Press, ISBN: 9780824709822.
10. Richard E. Bellman, Dynamic Programming, Princeton University Press, ISBN: 9780691146683.
11. Needleman S B and Wunsch C D, A General Method Applicable to the Search for Similarities in the Amino Acid Sequence of Two Proteins, J. Mol. Biol., 48 (1970) 443-453.
12. Smith T F and Waterman M S, Identification of Common Molecular Subsequences, J. Mol. Bio. 147 (1981) 195-197.



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13. Watson J D and Crick F H C, A Structure for Deoxyribose Nucleic Acid, Nature, 171 (1953) 737-738.

14. Pevzner P A and Waterman M S, Open Combinatorial Problems in Computational Molecular Biology, Proc. Third Israel Symp. Theo. Comp. Syst. IEEE Computer Society Press, (1995) 158 – 173

Wireless & Mobile Networks

CSS3E02b – Wireless & Mobile Networks

Unit I:

Introduction - applications - brief history of wireless communication – open

research problems – wireless transmission – frequencies for radio transmission – signals – antennas – signal propagation – multiplexing – modulation – spread spectrum – cellular systems – medium access control – motivation – SDMA – FDMA – TDMA – CDMA –

comparison.

Unit II:

Different generations of Wireless Cellular Networks - 1G, 2G, 2.5G, 3G, 4G.

Telecommunication systems – GSM – DECT – TETRA – UMTS – IMT-2000. WirelessLAN – Infrared Vs Radio transmission – Infrastructure Vs Adhoc networks – IEEE 802.11 – HIPERLAN – Bluetooth.

Unit III:

Mobile network layer - Mobile IP - Dynamic Host Configuration Protocol -

Routing - DSDV - DSR - Alternative Metrics. Transport and application layers - traditional TCP classical TCP improvements - WAP, WAP 2.0.

Unit IV:

Wireless network security - IEEE 80211i security - Wireless Transport Layer



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Security sessions and connections - protocol architecture - WAP end-to-end security.

Unit V:

Java for wireless devices - setting up the development environment - basic data types, libraries (CLDC, MIDP) - UI controls - displayable and display image - events and event handling - list and choice - text box - alerts - persistent storage - record stores - records - record enumeration - network MIDlets - the connection framework - connection interface - connection using HTTP - datagram connection.

References:

1. Jochen Schiller, Mobile Communications, Pearson Education, 2nd Edition, ISBN: MSc Computer Science (Academic Year 2019-20 Onwards)
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8131724263.
2. Raj Kamal, Mobile Computing, 2nd Edition Oxford Univ Press, ISBN: 0198068913.
3. William Stallings, Network Security Essentials Applications and Standards, 4th Edition, Pearson India, ISBN: 8131761754.
4. Yu Feng and Jun Zhu, Wireless Java Programming with J2ME, 1st Edition, Sams, ISBN: 0672321351.
5. Dreamtech Software Team, Wireless Programming with J2ME: Cracking the Code, Wiley, ISBN: 0764548859. C,
6. William Stallings, Wireless Communications and Networks, 2nd Edition, Pearson India, ISBN: 8131720934.
7. Jochen Burkhardt, Horst Henn, Stefan Hepper, Klaus Rindtorff and Thomas Schaeck, Pervasive Computing Technology and Architecture of Mobile Internet Applications, 14th Edition, Pearson Education, ISBN: 8177582801.
8. Nishit Narang and Sumit Kasera, 2G Mobile Networks: GSM and HSCSD, Tata McGraw Hill Education, ISBN: 0070621063.
9. Hasan Ahmed, Roopa Yavagal and Asoke K Talukder, Mobile Computing: Technology,



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Applications and Service Creation, 2nd Edition, Tata Mcgraw Hill Education Private Limited, ISBN: 0070144575.

Cryptography And Network Security

CSS3E02c – Cryptography And Network Security

Unit I:

Computer security concepts – challenges – security attacks – security services –

security mechanisms – a model for network security. Cryptography – symmetric encryption principles – cryptography – cryptanalysis – Feistel Cipher structure. symmetric block encryption algorithms - DES – Triple DES – AES – random and pseudorandom numbers –stream cipher and RC4 – cipher block modes of operation.

Unit II:

Message authentication – approaches – MAC – one way Hash function – secure

Hash functions – Message Authentication Codes. Public key cryptography principles –algorithms – digital Signatures.

Unit III:

Network security applications - symmetric key distributions using symmetric

encryption - Kerberos version 4 - key distributions using asymmetric encryption - X.509 certificates - public key infrastructure - federated identity management.

Unit IV:

Transport level security - web security considerations - secure socket layer and

transport layer security - SSL architecture - SSL record protocol - change cipher spec protocol- handshake protocol. Transport layer security - HTTPS - SSH. IP Security - overview -policy - encapsulating security payload - combining security associations - internet key

exchange.



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Unit V:

Intruders - intruders, intrusion detection, password management. Malicious

software - types, viruses, countermeasures, worms, DDoS. Firewalls - need - characteristics, types, firewall basing, location and configuration - DMZ networks, VPN - distributed firewalls.

References:

1. William Stallings, Network Security Essentials Applications and Standards, 4th Edition, Pearson India, ISBN: 8131761754.
2. William Stallings, Cryptography and Network Security: Principles and Practice, 6th Edition, Pearson India, ISBN: 9332518777.
3. Atul Kahate, Cryptography and Network Security, 3rd Edition, Tata McGraw- Hill Publishing, ISBN: 9789332900929.
4. Eric Maiwald, Fundamental of Network Security, 1st Edition, Tata McGraw - Hill Education, 0071070931.
5. Charlie Kaufman, Radia Perlman and Mike Speciner, Network Security: Private Communication in Public WorJd, 2nd Edition, PHI Learning Pvt Ltd, ISBN: 8120322134.

Advanced Web Technology

CSS3E02d – Advanced Web Technology

Unit I:

Web 2.0 - definition, characteristics, key features, client side technologies (Ajax and JavaScript frameworks - YUI library, Dojo toolkit, MooTools, jQuery, Ext JS and prototype JavaScript framework),



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server side technologies (Ruby, Perl, Python, Enterprise Java J2EE and Microsoft.NET Framework), concepts (Rich Internet Application — Web-Oriented Architecture — Social Web), SLATES.

Unit II:

Fundamentals of Web Services - Definition, Components, benefits, behavioural

characteristics. Web services architecture - web service roles, web service protocol stack, service transport. Web services components - XML-RPC, SOAP, WSDL, UDDI. web services security (notions) - confidentiality (XML-RPC and SOAP run on top of HTTP) -support for Secure Sockets Layer (SSL) for HTTP - encrypted communication via SSL, authentication (HTTP's built-in support for Basic and Digest authentication - SOAP security extensions - Digital Signature - SOAP - DSIG - SAML).

Unit III:

Introduction to Python - installation - Python interpreter - usage and

customization - editor setup - variables, expressions and statements - functions. Strings - lists - list comprehensions - stacks - queues - tuples - sequences - sets - dictionaries - sets - modules, I/O and exception handling - modules - search path - compiled modules - standard modules - packages - input and output functions - files - read and write - exception - handling and

raising - user defined exceptions.

Unit IV:

Server side programming using Python - server side scripting - CGI - role of Web server – Apache web server – Python server side script – developing Python Server Side Pages (PSP) – capturing form data – validation – processing data – exchange of data between form and server.

Unit V:

Python-SQLite integration - features of SQLite data types, introduction to SQL

commands - SELECT, DELETE, UPDATE, INSERT. Python functions for SQLite operations - database connection, database and table creation, selection, query, fetching results - insertion and deletion of data using Python - displaying data from SQLite in webpage. Case study - server MVC design pattern - Django.

References

1. James Governor, Web 2.0 Architectures: What Entrepreneurs & Information Architects Need to Know, 1st Edition, Shroff Publisher & Distributors, ISBN: 8184047355.



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3. Web 2.0, http://en.wikipedia.org/wiki/Web_2.0
4. Web Services, <http://www.tutorialspoint.com/webservices/>
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6. Sandeep Chatterjee, James Webber, Developing Enterprise Web Services: An MSc Computer Science (Academic Year 2019-20 Onwards)
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7. The Python Tutorial, <http://docs.python.org/3.3/tutorial/>
8. Allen Downey, Jeffrey Elkner and Chris Meyers, How to Think Like a Computer Scientist: Learning with Python, Createspace, 2009, ISBN: 1441419071. Online Version: <http://openbookproject.net/thinkcs/python/english3e/>
9. Python Documentation. A vailable at <http://www.python.org/doc/>
10. Swarooph CH, A Byte of Python. Available at <http://swarooph.com/notes/python/>
11. Wesley J Chun, Core Python Programming, 2nd Edition, Pearson Education, ISBN: 8131711889.



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Virtualization and Cloud Computing

CSS3E02e Virtualization and Cloud Computing

Unit I:

Introduction - evolution of cloud computing - system models for distributed and cloud computing - NIST cloud computing reference architecture - Infrastructure as a Service (IaaS) - resource virtualization - Platform as a Service (PaaS) - cloud platform & management - Software as a Service (SaaS) - available service providers.

Unit II:

Virtualization - basics of virtualization - types of virtualization - implementation levels of virtualization - virtualization structures - tools and mechanisms - virtualization of CPU, memory, I/O devices - desktop virtualization - server virtualization - Linux KVM, Xen, Qemu, LXC, OpenVZ.

Unit III:

Cloud infrastructure - FOSS cloud software environments - Eucalyptus, Open Nebula, OpenStack - OpenStack architecture - compute, object storage, image service, identity, dashboard, **networking**, block storage, metering, basic cloud orchestration and service definition.

Unit IV:

Programming model - parallel and distributed programming paradigms Mapreduce, twister and iterative Mapreduce – mapping applications - **programming support** – Apache Hadoop – HDFS, Hadoop I/O, Hadoop configuration, MapReduce on Hadoop.

Unit V:

Security in the cloud - security overview – cloud security challenges – software-as-a-service security – security governance – risk management – security monitoring – security architecture design – data security – application security – virtual machine security – Qubes – desktop security through Virtualization.

References:

1. Kai Hwang, Geoffrey C Fox, Jack G Dongarra, Distributed and Cloud Computing (From Parallel Processing to the Internet of Things), Elsevier Science, ISBN: 9780128002049.



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4. George Reese, Cloud Application Architectures, 1st Edition, Shroff /O'Reilly, ISBN: 8184047142.
5. Ravi Nair and Jim Smith, Virtual Machines: Versatile Platforms for Systems and Processes, 1st Edition, Elsevier Science / Morgan Kaufmann, ISBN: 9780080525402/ 1558609105.
6. Katarina Stanoevska - Slabeva, Thomas Wozniak, Santi Ristol, Grid and Cloud Computing - A Business Perspective on Technology and Applications, Springer, ISBN: 3642051928.
7. Open stack Operations Guide, <http://docs.openstack.org/ops/>.
8. Tom White, Hadoop: The Definitive Guide, O'Reilly Media, ISBN: 9780596551360.

Project Work

CSS4P01 – Project Work

Objectives:

- ♣ To give a practical exposure to the process of software development life cycle.
- ♣ To develop a quality software solution by following the software engineering



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principles and practices. Students are also encouraged to take up a research oriented

work to formulate a research problem and produce results based on its

implementation/simulation/experimental analysis.

Course Outline

Major project work is to be done individually by each student, under the guidance of a faculty member of the concerned department. Guide has to constantly monitor the works done by the student, imparting him/her the

necessary inputs for the successful completion of the project work. Students can either take up a real-life application oriented project work or research and development project. The student can formulate a project problem with the help of her/his guide and submit the project proposal of the same. Approval of the project proposal is mandatory. If approved, the student can commence working on it, and complete it.

Guidelines for Submission of Report

The distinguishing mark of a dissertation is an original contribution to knowledge. The dissertation is a formal document whose sole purpose is to

prove that you have made an original contribution to knowledge. Failure to prove that you have made such a contribution generally leads to failure. It is a test of the student's ability to undertake and complete a sustained piece of independent research and analysis / application development, and to write up the work in a coherent form according to the rules and conventions of the academic community. The role of the supervisor too is very crucial in this context. A satisfactory dissertation should not only be adequate in its methodology, in its analysis and in its argument, and adequately demonstrate its author's familiarity with the relevant literature; it should also be written in correct, coherent language, in an appropriate style, correctly following the conventions of citation. It should, moreover, have a logical and visible structure and development that should at all times assist the reader understands the arguments being presented. The layout and physical appearance of the dissertation should also conform to university standards.

The dissertation is to be prepared in TEX format (either Latex or a suitable Windows TEX

variant). The format of the report is included in Appendix A. Students are also encouraged to present their work in IT fest/conference/workshop/journal with the assistance and guidance of the supervisor. This should pave as a good start for the student in the art of publishing/presenting his/her work to the outside world. Due weightage is accommodated for publications out of the project work in the final evaluation.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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System Security

CSS4E03c – System Security

Objectives: To provide an understanding of the differences between various forms of computer security, where they arise, and appropriate tools to achieve them.

Course Outline

Unit I:

Notion of different types of securities - information security - computer security - security goals, relation between security, confidentiality, integrity, availability and authorization, vulnerabilities - principles of adequate protection. Notions of operating security, database security, program security, network security attacks - threats, vulnerabilities and controls. The kind of problems - interception, interruption, modification, fabrication. Computer criminals - amateurs, crackers, career criminals. Methods of defence - control, hardware controls, software controls, effectiveness of controls.

Unit II:

Program security - secure programs - fixing faults, unexpected behaviour, types of flaws. Non-malicious program errors - buffer overflows, incomplete mediation. Viruses and other malicious code - kinds of malicious code, how viruses attach, how viruses gain control, prevention, control example - the brain virus, the internet worm, web bugs. Targeted malicious code - trapdoors, Salami attack. Controls against program threats - development controls, peer reviews, hazard analysis.

Unit III:

Operating system security - protected objects and methods of protection - memory address protection - fence, relocation, base/bounds registers, tagged architecture, segmentation, paging. Control of access to general objects - directory, access control list. File protection mechanism - basics forms of protection, single permissions. Authentication - authentication basics, password, authentication process challenge - response, biometrics. Trusted operating systems - security policies for operating systems, models of security -



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requirement of security systems, multilevel security, access security, limitations of security systems. Trusted operating system design - elements, security features, assurance, system flaws and assurance methods.

Unit IV:

Database Security - security requirements - integrity of database, confidentiality

and availability, reliability and integrity, sensitive data, interface, multilevel database, proposals for multilevel security.

Unit V:

Administrating security - security planning - contents of a security planning, team members, commitment to a security plan, business continuity plans. Risk analysis - the nature of risk, steps of risk analysis. Arguments for and against risk analysis, organizational security policies - purpose and goals of organizational security. Audience, characteristics of a good security policy. Nature of security policies - data sensitivity policy, government agency IT security policy. Physical security - natural disaster, human vandals, interception of sensitive information.

References

1. C. P. Pfleeger and S. L. Pfleeger, Security in Computing, 4th Edition, Pearson India, ISBN: 9788131727256.
2. Matt Bishop, Computer Security: Art & Science, 1st Edition, Pearson, ISBN: 0201440997.
3. William Stallings, Cryptography and Network Security: Principles and Practice, 6th Edition, Pearson India, ISBN: 9332518777.
4. Michael E. Whitman and Herbert J. Mattord, Principles of Information Security, 4th Edition, Ceneage Learning India Pvt Ltd, ISBN: 8131516458



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Molecular Simulation and Modelling

CSS4E03d – Molecular Simulation and Modelling

Objectives:

- ♣ To understand application of simulation techniques to study molecular dynamics and derive properties.
- ♣ To learn and apply the statistical approaches and models for phylogenetic analysis and tree reconstruction.
- ♣ To understand the basis and nature of protein-protein interactions.
- ♣ To understand principles of docking simulations.

Course Outline

Unit I:

Overview of molecular modelling - molecular modelling methods - semi-empirical method and empirical method. Model Type - static, dynamic and probabilistic models. Models of growth and decay

Unit II:

System modelling - concept, principles of mathematical modelling, static physical model, stochastic activities, continuous and discrete simulation. Discrete system simulation - probability concepts in simulation, random number generations and their testing, stochastic variable generation. Model execution - event driven versus time driven.

Unit III:

Computational gene mapping - genetic mapping, gene expression, gene prediction methods, gene prediction tools, mutational analysis, introduction to restriction mapping and map assembly, mapping with restriction fragment fingerprints, Lander -



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Waterman statistics. Software Packages for Phylogenetic Analysis - PHYLogeny Inference Package (Phylip), Phylogenetic Analysis using Parsimony (PAUP) and Phylogenetic Analysis by Maximum Likelihood (PAML). Microarray technology - techniques for microarray data analysis - microarray databases. Scatter Plots, Principal Component Analysis, Cluster Analysis, Applications of Microarray Technology.

Unit IV:

Structural Modelling: Protein structure prediction - Prediction of protein secondary structure from the amino acid sequences. Prediction of three dimensional protein structure. Protein structure classification: Two major classification schemes - CATH and SCOP. Protein structure prediction: Steps involved in homology modeling. Protein-Protein Interactions: Prediction methods for Protein- Protein interactions. Protein- protein interaction Databases. Computer Assisted Drug Design (CADD): Protein based drug design cycle, drug discovery pipeline. Docking Simulations: Rigid docking and Flexible docking.

Unit V:

Molecular Visualization: Visualization of protein structure, Methods of studying proteins, Proteomics databases, Protein family databases, PDB file format. Software tools for 3D molecular graphic visualization: Rasmol - basic operations and steps in Rasmol to visualize the molecule, advantages of Rasmol, advantages of Swiss-PdbViewer.

References:

1. Stephen Misener and Stephen A. Krawetz, Bioinformatics: Methods and Protocols, 1st Edition, Humana Press, ISBN: 1617371564.
2. Geoffrey Gordan, System Simulation 2nd Edition, PHI, ISBN: 9788120301405.
3. Tamar Schlick, Molecular Modeling and Simulation: An Interdisciplinary Guide, 2nd Edition, Springer, ISBN: 14426902.
4. Narsingh Dev, System Modelling with Digital Computer, PHI, ISBN: 0138817898.



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5. Andrew Leach, Molecular Modelling: Principles and Applications, Prentice Hall. 2nd Edition, ISBN: 81317286092001.
6. Prakash S Lohar, Bioinformatics, MJP publishers, Chennai, ISBN: 9788180940668.
7. H-D Holtje, Molecular Modeling - Basic Principles and Applications, 3rd Edition, Wiley-VCH, ISBN-13: 9783527315680.
8. Alan Hinchliffe, Molecular Modelling for Beginners, 2nd Edition, John Wiley and Sons Ltd, ISBN: 9780470513149.
9. N Cohen, Guidebook on Molecular Modeling in Drug Design, 1st Edition, ISBN :9780121782450
10. Masatoshi Nei and Sudhir Kumar, Molecular Evolution and Phylogenetics, Oxford University Press, ISBN: 0195135857.
11. Asheesh Shanker, Vinay Sharma and Ashok Munjal, A Textbook of Bioinformatics, 1st Edition, Rastogi Publications, New Delhi, ISBN: 9788171339174.
12. Des Higgins (Ed), Willie Taylor (Ed), Bioinformatics: Sequence, Structure and Databanks - A Practical Approach, 3rd Edition, New Delhi Oxford University Press, ISBN: 0195667530.



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Web Engineering

CSS4E03f Web Engineering

Unit I:

Web Engineering (WE) – introduction – motivation – categories & characteristics of web applications – product related, usage related and development related – evolution of WE.

Unit II:

Requirements Engineering (RE) for web applications - introduction -

fundamentals - sources of requirements - RE activities - RE specifications in WE - RE principles for web applications - adapting RE methods for web applications development - requirement types, notations, tools.

Unit III:

Web application architecture - introduction - fundamentals - definition of

architecture - developing and characterising architectures - components of a generic web application architecture - layered architecture - database centric architecture - architecture for web document management - architecture for multimedia data.

Unit IV:

Modelling web applications - introduction - modelling specifics in WE - levels –aspects phases of customizations - modelling requirements - hypertext modelling - hypertext structure modelling concepts - access modelling concepts. Web application design - web design from an evolutionary perspective - information design - software design merging information design & software design - problems and restrictions in integrated web design -a proposed structural approach - presentation design - presentation of nodes and meshes -device independent development - approaches - interaction design - user interaction - user interface organization - navigation design - deigning a link representation - designing link internals - navigation and orientation - structural dialog for complex activities - interplay with technology and architecture - functional design.

Unit V:

Testing web applications - introduction - fundamentals - terminology - quality characteristics - test objectives - test levels - role of tester - test specifics in we - test approaches - conventional, agile - test



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schemes - three test dimensions - applying the scheme to web applications - test methods and techniques - link testing - browser testing - usability testing - load, stress and continues testing - testing security - test- driven development. Web project development - scope - refining frame work activities - building a WebE team - risk management - making schedule - managing quality, change - project tracking.

References

1. Gerti Kappel, Birgit Proll, Siegried Reich and Werner Retschitzegger, Web Engineering: The Discipline of Systematic Development of Web Applications, John Wiley and Sons Ltd, ISBN: 9780470064894.
2. Roger S Pressman and David Lowe, Web Engineering: A Practitioner's Approach, 1st Edition, Tata Macgraw Hill Publications, ISBN: 9780073523293.
3. Leon Shklar and Rich Rosen, Web Application Architecture: Principles, Protocols and Practices, 2nd Edition, Wiley, ISBN: 047051860X.
4. Guy W Leeky-Thompson, Just Enough Web Programming with XHTML, PHP, and MySQL, 1st Edition, Cenagage Learning, ISBN: 159863481X.
5. Anders Moller and Michael Schwartzbach, An Introduction to XML and Web Technologies, 1st Edition, Pearson Education, New Delhi, 2009.
6. Christs Bates, Web Programming: Building Internet Applications, 3rd Edition, Wiley India Edition, ISBN: 8126512903. MySQL, 1st Edition, Cenagage Learning, ISBN: 159863481X

Advanced Java Programming

CSS4E04f Advanced Java Programming

Unit I:

RMI & Servlets - introduction, architecture, defining remote objects, creating stubs and skeletons, serializable classes, accessing remote objects, factory classes, dynamically loaded classes, RMI activation, registering remote objects.



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Unit II:

Servlets, generic servlet, servlets that access request headers, develop servlets that manipulate response headers, HTTP servlets, forms, HTTP protocols - configuring Tomcat Server, servlet context, servlet context listener, servlet chaining.

Unit III:

JNDI & EJB - architecture, context initial context class, objects in a context,

binding objects, accessing directory services, attributes and attribute interface modifying directory entities, creating directories entities. EJB roles, architecture, container, implementing a basic EJB object, implementing session beans, implementing entity bean, deploying an enterprise bean object.

Unit IV:

Java Server Pages (JSP) - developing JSP pages, technology, syntax using scripting elements, syntax using the courier page directive, create and use JSP error pages, building reusable web presentation, components, JSP technology syntax using the include directive, JSP technology syntax using the jsp:include standard action, developing JSP Pages using custom tags, problem with JSP technology scriptlet code, given an existing custom tag library, develop a JSP page using the library, developing a simple custom tag, structure and

execution of a custom tag in a JSP page, tag handler class for a simple empty custom tag, custom tag that includes its body in the contour of the HTTP response, tag library description for a simple, empty custom tag.

Unit V:

Hibernate - ORM overview - Hibernate overview, environment, configuration, sessions, persistent class - mapping files - mapping types - examples - O/R mappings - annotations - Hibernate Query Language - Hibernate criteria - queries - Hibernate Native

SQL, caching, batch processing, interceptors.

References

1. Jason Hunter and William Crawford, Java Servlet Programming, 2nd Edition, O'Reilly Media, ISBN: 0596000405.
2. Karl Moss, Java Servlets, McGraw-Hill, ISBN: 0074637398.



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- Barry Burd, JSP: JavaServerPages, IDG Books, ISBN: 0764535358.
- Prashant Sridharan, Javabeans Developer's Resource, ISBN: 0138873089.
- Chuck Cavaness, Programming Jakarta Struts, 2nd Edition, O'Reilly Media, ISBN: 0596006519.
- Madhusudhan Konda, Just Hibernate: A Lightweight Introduction to the Hibernate Framework, Oreilly Meida, ISBN: 9781449334376

Computer Fundamentals and HTML

BCA1B01 Computer Fundamentals and HTML

Unit I [5 T]

Concepts of Hardware and Software: Computer Languages, Language Translators, Features of good language, Basics Computer Organization: Von Neumann Model, Input Unit, Output Unit,

Storage Unit, Control Unit, Memory Hierarchy, Primary Storage, Cache Memory, Registers, Secondary Storage Devices, **Basics of Hardware Components – SMPS, Motherboard, Add-on Cards, Ports, Memory, Adapters, Network cables**, Basic Computer Configuration

Unit II [10 T]

Number Systems and Boolean Algebra – Decimal, Binary, Octal and Hexadecimal Numbers, Arithmetic involving Number Systems, Inter Conversions of Number Systems, 1's and 2's

Complements, Complement Subtractions, Digital Codes – Binary Coded Decimal (BCD),SCII Code ,Unicode, Gray Code, Excess-3 Code. Boolean Algebra: Boolean Operations, Logic Expressions, Postulates, Rules and Laws of Boolean Algebra, DeMorgan's Theorem, Minterms, Maxterms, SOP and POS form of Boolean Expressions for Gate Network, Simplification of Boolean Expressions using Boolean Algebra and Karnaugh Map Techniques (up to 4 variables)

Unit III [7 T]

Fundamentals of Problem Solving – The Problem Solving Aspect, Top-down Design, Definition – Algorithm, Flowchart, Program - Properties of Flowcharts – Flowchart Symbols for



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Designing Application Programs, Sample Algorithms – Sum, Average, Finding Smallest Number, Checking Odd/Even Number, Prime Number, Quadratic Equation

Unit IV [5T + 16L]

Basics of Web Design – www, W3C, Web Browser, Web Server, Web Hosting, Web Pages, DNS, URL, Introduction to HTML, XHTML, DHTML, HTTP.

Overview of HTML 5 – Basic Formatting Tags: heading, paragraph, break, underline, bold, italic, superscript, subscript, font and image, attributes: align, color, bgcolor, font face, border, size, navigation links using anchor tag: internal, external, mail and image, lists: ordered, unordered and definition, HTML media tags: audio and video

Unit V [5T+16L]

Creating Simple Tables: row, col, heading, cell, border, spanning – Form Controls: Input types –text, password, text area, button, checkbox, radio button, select box, hidden controls, frames and frame sets CSS: Introduction - Concept of CSS, Creating Style Sheet: inline and internal, CSS Properties, CSS

Styling: Background, Text Format, Controlling Fonts - Working with Block Elements and Objects, CSS ID and Class

Text Books

1. Sinha. P.K, Computer Fundamentals, BPB Publications
2. Ram. B, Computer fundamentals, New Age International Pvt. Ltd Publishers
3. Rajaraman V and Radhakrishnan, An introduction to Digital computer Design, PHI,
4. HTML 5 Blackbook, Dream Tech Press, 2016 Edition

Reference Books

1. Thomas L Floyd, Digital Fundamentals, Universal Book Stall
2. Bartee T.C, Digital Computer Fundamentals, THM



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Problem Solving Using C

BCA2B02 Problem Solving Using C

Unit I [4T+ 4L]

Introduction to C Programming - Overview and Importance of C, C Program Structure, Sample programs. Familiarization of Integrated Development

Environment - Invoking IDE, Opening a new window in IDE, Writing, Saving and Compiling a C program, making an Executable File.

Elements of C Language and Program Constructs: Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable Declaration and Assignment of Values, Symbolic Constant Definition.

Unit II [4T+ 6L]

C Operators - Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations - Library functions.

Unit III [4T + 10L]

Data input output functions - Simple C programs – Flow of Control - Decision making with IF statement, Simple IF statement, If-else statement, Nesting of If-else and else-if Ladder, Switch statement, Conditional operator, goto statement. Looping - While loop, Do-While, and For Loops, Nesting of loops, jumps in loop, skipping of loops.

Unit IV [6T+ 10L]

Arrays and Strings - One dimensional array, two dimensional and multi-dimensional arrays, strings and string manipulation functions.

The Concept of modularization and User defined functions - Definition - Multifunction Program, prototypes, Passing arguments, calling functions, various categories of functions, Nesting of functions and recursion, functions and arrays, scope and lifetime of variables in functions, multi-file



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programs Structures & Union structure definition - giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit fields.

Unit V [6T+10L]

Pointers - Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string, pointers and functions, pointers and structures, pointer to pointer dynamic memory allocation.

Files: Creating, Processing, Opening and Closing a data file, command line operations

Textbook:

1. Balaguruswami. E, Programming in ANSI C, Tata McGraw-Hill Education, 2008

References

1. Brian W. Kernighan & Dennis M. Ritchie, The C Programming Language, Prentice Hall, 2nd Edition 1998
2. Yashavant P. Kenetkar, Let us C
3. ByranGotfried, Schaums Outline series Programming with C
4. Ashok N. Kamthane, Programming in C, Pearson, 2nd Editio



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Financial and Management Accounting

BCA2C03 Financial and Management Accounting

UNIT I (12T)

Principles of accounting - Some fundamentals concepts and conventions - Systems of accounting double entry principles - Advantages of Double entry system - personal, real, nominal accounts.

UNIT II (12T)

Cash book - forms of cash books - subdivisions of Journal - Ledgers - limitations of financial accounting - Trial balance - Final accounts - Trading P/L A/c - Balance sheet

UNIT III (12T)

Invitation to management accounting: Analysis and interpretation of trading accounts and financial statements - Horizontal Vertical analysis - Common size Balance sheet - common size income statement - comparative income and balance sheet - trend analysis.

UNIT IV (12T)

Marginal costing - Breakeven point - cost volume profit analysis - margin of safety

UNIT V (12T)

Standard costing - analysis of variance - material - labour - O/H - sales variables - Budget and Budgetary control - different types of budgets - master budget - sales budget - production

budget - flexible budget - cash budget - advantages – preparation

Textbooks

1. Financial Management, Pandey I.M Vikas publishing house

References:

1. Elements of Accounting, Kellock.J, Heinmann

2. Advanced Accountancy, S.N Maheshwari, Vikas Publishing

3. Cost and Management Accounting, A.Vinod, Calicut University Central Co-Operative

Store



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Python Programming

XXXXA11 Python Programming

UNIT I [16T]

Introduction to python, features, IDLE, python interpreter, Writing and executing python scripts, comments, identifiers, keywords, variables, data type, operators, operator precedence and associativity, statements, expressions, user inputs, type function, eval function, print function.

UNIT II [16T]

Boolean expressions, Simple if statement, if-elif-else statement, compound boolean expressions, nesting, multi way decisions. Loops: The while statement, range functions, the for statement, nested loops, break and continue statements, infinite loops.

UNIT III [16T]

Functions, built-in functions, mathematical functions, date time functions, random numbers, writing user defined functions, composition of functions, parameter and arguments, default parameters, function calls, return statement, using global variables, recursion

UNIT IV [16T]

String and string operations, List- creating list, accessing, updating and deleting elements from a list, basic list operations. Tuple- creating and accessing tuples in python, basic tuple operations. Dictionary, built in methods to access, update and delete dictionary values. Set and basic operations on a set.

References:

1. E. Balaguruswamy, Introduction to Computing and Problem Solving Using Python
2. Richard L. Halterman, Learning To Program With Python
3. Martin C. Brown, Python: The Complete Reference.

Data Communication and Optical Fibers

A12– Data Communication and Optical Fibers

Unit I [16T]:

Introduction- **Components**, Networks, Protocols and standards, Basic Concepts: Line Configuration, Topology Transmission mode, analog and digital signals, Encoding and modulating analog-to-digital conversion, digital to analog conversion, digital data transmission, DTE-DCE, interface, **modems, cable modems**. **Transmission media: guided media, unguided media**, and transmission impairment.



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Unit II [16T]

Multiplexing: Many to one/ one to many, frequency division multiplexing, wave division multiplexing, TDM, multiplexing applications: **the telephone system, Cellular System, Mobile Communication-GSM, Mobile Services, GSM system Architecture, Radio Interface in GSM**

Unit III [16T]

Data link Control: Line Discipline, flow control, error control, Data link Protocols: Asynchronous Protocols, synchronous protocols, character oriented protocols, bit – oriented protocols, link access procedures. **Local Area Networks: Ethernet, token bus, token ring, FDDI, Comparison, Switching circuit switching, packet switching, message switching, integrated services digital networks**

(ISDN): services, history, subscriber access to ISDN.

Unit IV [16T]

Overview of Optical Fiber Communication - Introduction, historical development, general system, advantages, disadvantages, and applications of optical fiber communication, optical fiber waveguides, fiber materials, Optical Sources And Detectors- **Introduction, LED's, LASER diodes, Photo detectors. Ray theory, cylindrical fiber, single mode fiber, cutoff wave length, mode field**

Diameter.

Text Book:

1. Behrouz A. Forouzan, Data Communication and Networking, TMH
2. Mobile Communications – Jochen H. Schiller , Second Edition , Pearson
3. Optical Fiber Communication – Gerd Keiser, 4th Ed., MGH, 2008.

Reference Books:

1. William Stallings: Data & Computer Communications, 6/e, Pearson Education.
2. William L. Schweber : Data Communication, McGraw Hill.
3. Electronic Communication Systems - Kennedy and Davis, TMH
4. Optical Fiber Communications – John M. Senior, Pearson Education. 3rd Impression, 2007



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Data Structures Using C

BCA3B04 Data Structures Using C

UNIT I [9 T + 7L]

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, Applications of data structures, Algorithms complexity and time-space trade off, Big-O notation.

Strings: Introduction, strings, String operations, Pattern matching algorithms

UNIT II [10 T + 14 L]

Arrays: Introduction, Linear arrays, Representation of linear array in memory, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, sparse matrix. Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way

linked list, Applications of linked lists, Algorithm of insertion/deletion in Singly Linked List (SLL).

UNIT III [10 T + 14 L]

Stack: primitive operation on stack, algorithms for push and pop. Representation of Stack as LinkedList and array, Stacks applications: polish notation, recursion.

Introduction to queues: Primitive Operations on the Queues, Circular queue, Priority queue, Representation of Queues as Linked List and array, Applications of queue: Algorithm on insertion and deletion in simple queue and circular queue.

UNIT IV [10 T + 14 L]

Trees - Basic Terminology, representation, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree: insertion, deletion and processing, Traversal of binary trees: In order, Pre-order & post-order, Algorithm of tree traversal with and without recursion, Binary Search Tree, Operation on Binary Search Tree, expression trees, implementation using

pointers, applications.

UNIT V [10 T + 14 L]



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Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, graph traversal- depth-first and breadth-first traversal of graphs, applications. Searching: sequential searching, binary searching, Hashing – linear hashing, hash functions, hashtable searching; Sorting: Quick Sort, Exchange sort, Selection sort and Insertion sort.

Text books

1. Seymour Lipschutz, “Data Structures”, Tata McGraw- Hill Publishing Company Limited, Schaum’s Outlines, New Delhi.
2. YedidyanLangsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, “Data Structures Using C”, Pearson Education., New Delhi.
3. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., NewDelhi.

Reference books

1. Trembley, J.P. And Sorenson P.G., “An Introduction to Data Structures With Applications”, Mcgraw- Hill International Student Edition, New York.
2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Addison- Wesley, (An Imprint of Pearson Education), Mexico City.
3. A.K.Sharma, Data Structures Using C, Pearson, Second edition, 2011
4. Nair A.S., Makhalekshmi, Data Structures in C, PHI, Third edition 2011.
5. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education Asia, Delhi- 2002
6. K Loudon, “Mastering Algorithms with C”, Shroff Publisher & Distributors Pvt. Lt



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Theory of Computation

BCA3C06 Theory of Computation

UNIT I (10T)

Introduction to Mathematical preliminaries: Sets, Functions and Relations, graphs and trees, Strings and their Properties, Proof techniques: By induction, by contradiction

UNIT II (10T)

Formal languages: Definitions and examples, Chomsky classification of languages, Languages and their relation, Recursive and Recursively enumerable sets, Languages and automata.

UNIT III (20T)

Theory of Automata: Definition of automaton, description of a finite automaton, DFA, transition systems, properties of transition functions, acceptability of a string by a finite automaton, Non deterministic finite state machines: with epsilon moves and without epsilon moves, equivalence of DFA and NFA, Mealy and Moore Models, minimization of finite automata. Regular sets and grammar: Regular expressions, Finite automata and regular expressions, closure properties of regular sets, Algebraic laws for regular expressions, regular sets and regular grammars

UNIT IV (20T)

Context free languages: Context free languages and derivation trees, Ambiguity in context free grammars, Simplification of context free languages, normal forms for context free languages.

UNIT V (20T)

Pushdown automata: Definition, Acceptance by PDA, Pushdown automata and Context-free languages, Parsing and Pushdown Automata. **Turing Machines: Turing machine model, representation of Turing machines, languages accepted by Turing machine.**

Textbooks

1. Theory of Computer Science- Automata, Languages and Computation- K.L.P.

Mishra, N Chandrasekaran, PHI

2. Theory of Computation, Sachin Agrawal, Vikas Publishing House

Reference books



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Introduction to Automata Theory, Languages & Computations, J.E Hopcroft, R Motwani & J. D. Ullman
2. Elements of theory of Computation, Second edition, H.R. Lewis and C.H. Papadimitriou, Pearson education.
3. An Introduction to the Theory of Computer Science, Languages and Machines-Thomas A. Sudkamp, Third Edition, Pearson Education.
5. An Introduction to Formal languages and Automata- Peter Linz

Microprocessors Architecture and Programming

A13 Microprocessors Architecture and Programming

Unit I [16 T]

General architecture of computer, Introduction to Microprocessor, Memory classification, Introduction to 8085, Microprocessor bus organizations, data bus, address bus, control bus. Memory addressing, memory mapping. 8085 architecture in detail. General purpose registers and special purpose registers, flag register -8085 pins and signals.

Unit II [16 T]

Assembly language programming basics. Opcode, Mnemonics etc. 8085 instruction set, Data transfer, Arithmetic and Logic, Shifting and rotating, Branching/Jump, Program control. Addressing modes. Memory read and write cycle. Timing diagram. Instruction cycle, machine cycle and T-states. Types of I/O addressing. Simple programs.

Unit III [16 T]

Types of programming techniques looping, indexing (pointers), delay generation. Stack in 8085, call and return Instructions. Data transfer between stack and microprocessor. Subroutine and delay programs. Interrupts in 8085. Interrupt driven programs. **Interfacing - Programmable peripheral devices - 8255A, 8254, 8237.**

Unit IV [16 T]

Introduction to 8086/88 microprocessors – overview, 8086 internal architecture. The execution unit, BIU, Registers, Flags, Segmentation, physical address calculation, addressing modes.

Text Books:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Ramesh S. Gaonkar, Microprocessor Architecture Programming and Application with 8085, Prentice Hall

2. Doughles V Hall, Microprocessors and Interfacing: Programming and Hardware, Tata McGraw Hill

Reference Books:

1. Microprocessor and Microcomputer - Based system Design - M. Rafiquzzman - CRC press

2. A.P Mathur, Introduction to Microprocessors, Tata McGraw-Hill Education

3. The Intel Microprocessors: 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro, Pentium II, III, IV and Core 2 with 64 bit Extensions, Barry B. Brey, Prentice Hall Pearson

4. Microprocessors PC Hardware and Interfacing –N.Mathivanan – PHT

Sensors and Transducers

A12 Sensors and Transducers

Unit I [16 T]

Transducers: Definition, Principle of sensing & transduction, Classification, Characteristics of transducers. Basic requirement of transducers. Resistance Transducer: Basic principle – Potentiometer – Loading effects, Resistance strain gauge – Types. Inductance Transducer: - Basic principle – Linear variable differential transformer – RVD Types. Capacitance Transducer: Basic principle- transducers using change in area of plates – distance between plates- variation of dielectric constants – Types

Unit II [16 T]

Thermal sensors: Resistance change type: RTD - materials, construction, types, working principle, Thermistor - materials, construction, types, working principle, Thermo emf sensors: Thermocouple –



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Principle and types, Radiation sensors: Principle and types. Pressure Transducers: basic principle- different types of manometers-u tube manometer-well

type manometer

Unit III [16 T]

Level transducer-continuous level measurement-discrete level measurement-mass –capacitive level gauges Flow Transducers: Bernoulli’s principle and continuity, Orifice plate, nozzle plate, ventur tube, Rotameter, anemometers, electromagnetic flow meter, impeller meter and turbid flow

meter

Unit IV [16 T]

Hall effect transducers, Digital transducers, Piezo-electric sensors, eddy current transducers, tacho generators and stroboscope, Magnetostrictive transducers

Radiation sensors: LDR, Photovoltaic cells, photodiodes, photo emissive cell types Force and Torque Transducers: Proving ring, hydraulic and pneumatic load cell, dynamometer and gyroscopes. Sound Transducers: Sound level meter, Microphone.

Text Books

1. D Patranabis, Sensors and Transducers, PHI, 2nd Edition.
2. E. A. Doebelin, Measurement Systems: Application and Design McGraw Hill, New York
3. A.K. Sawhney,- A course in Electrical & Electronic Measurement and Instrumentation, Dhanpat Rai and Company Private Limited.
4. Murthy D.V.S., —Transducers and Instrumentation, 2nd Edition, Prentice Hall of India Private Limited, New Delhi, 2010.
5. S.Renganathan, —Transducer Engineering, Allied Publishers, 2000



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Database Management System and RDBMS

BCA4B05 Database Management System and RDBMS

Unit I [8 T+ 2L]

Database System concepts and applications Introduction to databases, File Systems vs. DBMS, Advantages and Disadvantages of using DBMS Approach, Database administrators and user, Data Models, Schemas, and Instances, Types of Data Models, Three Schema Architecture and Data Independence, Database Languages and Interfaces.

Unit II [10 T+ 6L]

Entity-Relationship Model - Conceptual Data Models for Database Design Entity Relationship Models, Concept of Entity, Entity Sets, Relationship Sets, Attributes, Domains, Constraints, Keys, Strong and Weak Entities, Concepts of EER. Relational Data Model Relations, Domains and Attributes, Tuples, Keys. Integrity Rules, Relational Algebra and Operations, Relational Calculus and Domain Calculus, Relational Database Designing ER to Relational Mapping.

Unit III [10 T+12L]

Relational Database Design - Relational database design Anomalies in a Database, Normalization Theory, Functional Dependencies, First, Second and Third Normal Forms, Relations with more than one Candidate Key, Good and Bad Decompositions, Boyce Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Unit IV [10 T +20L]

SQL Concepts: Basics of SQL, DDL, DML, DCL, Tables – Create, Modify and Delete table structures, Rename and Drop tables, Defining constraints – Primary key, foreign key, unique, not null, check, IN operator Select Command, Logical Operators, Functions - aggregate functions, Built-in functions – numeric,

date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All. View - Creation, Renaming the column of a view, destroys view.

Unit V [10 T+24L]

Transaction Management and Concurrency Control - Transaction Properties (ACID), states, Commit, Rollback; Concurrency Control Lost update problems, Locks, two phase locking. Programming with SQL: Data types: Base and Composite, Attributes. Variables – Constants -Using set and select commands, Control Structures: IF, IF THEN ELSE, IF THEN ELSEIF, CASE.



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Loops: LOOP, EXIT, CONTINUE, WHILE, FOR, and FOREACH - Looping Through Arrays -Looping Through Query Results. Security: Locks: Table-level Lock, Row-level Lock, Deadlock, Advisory Lock. Cursors: Bound and Unbound Cursors, Declaration, Opening, Working with cursors: FETCH, MOVE, UPDATE/DELETE, CLOSE, Looping through a Cursor. Concept of Stored Procedures – Advantages and Disadvantages – Creation – Parameters Setting for Function- Alter – Drop – Grant and Revoke - Passing and Returning data to/from Stored Procedures - Using stored procedures within queries – Triggers: Creation, Modification, Deletion, Error Handling: Control Structures, Cursors, Functions, Triggers.

Textbooks:

1. Abraham Silberschatz, Henry F Korth, S.Sudharshan, Database System Concepts, 6th Edition
2. W. Gilmore, Beginning PHP and PostgreSQL 8: From Novice to Professional, Goels Computer Hut (2007), ISBN: 9788181286000
3. PostgreSQL Official Documentation Online

Reference books:

1. Alex Krigel and Boris M.Trukhnov, SQL Bible, Wiley pubs
2. Paul Nielsen, Microsoft SQL Server 2000 Bible, Wiley Dreamtech India Pubs.
3. CJ Date, Introduction to Database Systems, Addison Wesley.
4. Ramkrishnan, Database Management Systems, McGraw Hill

Computer Organization and Architecture

BCA5B07 Computer Organization and Architecture

Unit I [12 T]

Digital Logic - Positive and negative logic, logic gates ,NOT gate, OR gate, AND gate, XOR and X-NOR gates, Universal gates- NAND gate, NOR gate,. Combinational circuits- Half adder, half subtractor, full adder, full subtractor, ripple carry adders, look-ahead carry adders, decoders, BCD to 7-segment decoder, encoders, multiplexers and demultiplexers.

Unit II [13 T]

Sequential Logic Circuits: Edge triggering, Pulse triggering ,SR latch, SR flip flop, JK flip flop, Master Slave JK flip flop, D flip flop, T flip flop. Shift register: serial in - serial out, serial in -parallel out, parallel



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in - serial out, parallel in-parallel out configurations. counters (asynchronous & synchronous), up/down counter, decade counter, mod N counter, Ring counter, Johnson"s counter

Unit III [13 T]

Basic Computer Organization and Design: Instruction Codes , Computer Registers, Computer Instructions, Instruction types, Timing and Control, Instruction Cycle, Memory reference Instructions, Register reference instructions, Input, Output and Interrupt Design of Basic Computer,

Design of Accumulator logic

Unit IV [13 T]

Micro programmed Control: Control Memory, Address sequencing, Micro program Example, Design of control unit. Processor Organization: general register organization, stack organization, instruction formats, addressing modes, data transfer and manipulation, program control

Unit V [13 T]

Memory Organization: Memory mapping, Associative memory, Cache memory, Virtual Memory, Memory Management Hardware, hit/miss ratio, Input-Output Organization: Peripheral devices, I/OInterface, Modes of Transfer-asynchronous and synchronous, Priority Interrupt, Strobe Control,

Handshaking. Direct Memory Access, Input-Output Processor, Serial Communication. I/O

Controllers

Textbooks:

1. Thomas L Floyd, Digital Fundamentals, Universal Book Stall (Unit I and II)
2. M. Morris Mano, Computer System Architecture PHI (Unit III – V)

References:

1. Rajaraman V & Radhakrishnan, An Introduction to Digital Computer Design, PHI.
2. William Stallings, Computer Organization and Architecture, PHI.
3. Malvino & Leach, Digital Principles & Applications, TMH
4. Jain R.P. , Modern Digital Electronics, TMH
5. Malvino, Digital Computer Electronics, TMH
6. Bartee T.C., Digital Computer Fundamentals, THM



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

7. William H. Gothmann, Digital Electronics: An Introduction to Theory and Practice, PHI

Java Programming

BCA5B08 Java Programming

Unit I [9 T + 5L]

Introduction to OOPS, Characteristics of OOPS, Object oriented languages, comparison between procedural and object oriented programming, basic principles of Object Orientation-class, object, abstraction, encapsulation, inheritance, polymorphism, modularity, and message passing. Features of object orientation - attributes, state, identity, operation, behaviour.

Unit II [9 T + 8L]

Introduction to Java: History, Versioning, The Java Virtual Machine, Byte code, Writing simple java program, Language Components: Primitive Data Types, Comments, Keywords, literals, The break Statement, The continue Statement, Operators – Casts and Conversions, Arrays. Introduction

to classes and methods, constructors, Passing Objects to Methods, Method Overloading, Static and final, The this Reference, finalize, inner and nested classes. Inheriting class, extends, member access and inheritance, super keyword, Object class. Dynamic method dispatch, method overriding, abstract class, interface, packages, import statement.

Unit III [10 T + 12 L]

Exceptions, I/O and Threads Input and Output in Java: The File Class, Standard Streams, Keyboard Input, File I/O Using Byte Streams, Character Streams, File I/O Using Character Streams - Buffered Streams, File I/O Using a Buffered Stream, Keyboard Input Using a Buffered Stream Writing Text Files. Threads: Threads vs. Processes, Creating Threads by Extending Thread, Creating Threads by Implementing Runnable, Advantages of Using Threads, Daemon Threads,

Thread States, Thread Problems, Synchronization. Exceptions: Exception Handling, The Exception Hierarchy, throws statement, throw statement, Developing user defined Exception Classes- The finally Block.

Unit IV [10 T + 12 L]



CRITERION	I	Curricular Aspects
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Database Connectivity & Applets: Introduction to JDBC : The JDBC Connectivity Model, Database Programming, Connecting to the Database, Creating a SQL Query, Executing SQL

Queries, Getting the Results, Updating Database Data, Executing SQL Update/Delete, The Statement Interface, The ResultSet Interface, ResultSetMetaData. Introduction to GUI Applications- Applets - Types of Applet, Applet Skeleton, Update method, repaint Methods, Html Applet tag

and passing parameter to applet.

Unit V [10 T + 11 L]

Events and GUI Applications: Event Handling: The Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter Classes. Java Desktop Applications, Introduction to the AWT, Overview of the AWT, Structure of the AWT, The AWT hierarchy, Containers, Components,

Canvas, Frame Working with: Color, Font, FontMetrics, Simple Graphics- Point, line, Rectangle, Polygon, Controls - Button, , Checkbox, Choice, , Label, List, Scroll bar, TextArea, TextField, Layout Manager, MenuBar, Menu, MenuItem , Checkbox MenuItem.

Text Books

1. Herbert Scheldt, Java The Complete Reference, 8th Edition, Tata McGraw-Hill Edition, ISBN: 9781259002465

References

1. E Balaguruswamy, Programming in Java: A Primer, 4th Edition, Tata McGraw Hill Education Private Limited, ISBN: 007014169X.
2. Kathy Sierra, Head First Java, 2nd Edition, Shroff Publishers and Distributors Pvt Ltd, ISBN: 8173666024.
3. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, Java Enterprise in a Nutshell: A Desktop Quick Reference, 3rd Edition, O'Reilly Media, ISBN: 059610142

Web Programming using PHP

BCA5B09 Web Programming using PHP



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KEY INDICATOR	1.3	Curriculum Enrichment
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Unit I [9 T + 9L]

Introduction web-documents: Static, Dynamic, Active - Web programming: client side and server side scripting. HTML 5: Document Structure, Elements, Attributes, Types of Elements and Attributes, Basic HTML Data types. Using HTML5 form elements: datalist, keygen, output, progress, meter. File uploading using forms - Frameset and frames. CSS: External CSS, CSS3

Syntax, Selector: Universal, Class, ID. Working with Lists and Tables, CSS ID and Class – Navigation Bar - Image Gallery – Image Opacity.

Unit II [9 T + 9L]

Javascript: Introduction, Client side programming, script tag, comments, variables. Including JavaScript in HTML: head, body, external. Data types. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements,

Loops, break and continue. Output functions: write, writeln, popup boxes: prompt, alert, confirm. Functions: Built-in Global Functions: alert(), prompt(), confirm(), isNaN(), Number(), parseInt(). User Defined Functions, Calling Functions with Timer, Events Familiarization: onLoad, onClick, onBlur, onSubmit, onChange, Document Object

Model (Concept). Objects: String, Array, Date

Unit III [10 T + 10 L]

PHP: Introduction, Server side programming, Role of Web Server software, Including PHP Script in HTML: head, body, external. Comments, Data types, variables and scope, echo and print. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements, Loops, break and continue. User Defined Functions.

Unit IV [10 T + 10 L]

Working with PHP: Passing information between pages, HTTP GET and POST method, Cookie, Session. String functions: strlen, strpos, strstr, strcmp, substr, str_replace, string case, Array constructs: array(), list() and foreach(). Header().

Unit V [10 T + 10 L]

PHP & PostgreSQL: Features of PostgreSQL, data types, PostgreSQL commands – CREATE DATABASE, CREATE TABLE, DESCRIBE TABLE (\d table_name or using usinginformation_schema), SELECT, SELECT INTO, CREATE AS, DELETE, UPDATE, INSERT. PHP - PostgreSQL Integration: Establishing Database Connection (pg_connect(), pg_connection_status(),



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pg_dbname(), Getting Error String (pg_last_error()), Closing database Connection (pg_close()), Executing SQL statements (pg_query(), pg_execute()), Retrieving Data

(pg_fetch_row(), pg_fetch_array(), pg_fetch_all(), pg_fetch_assoc(), pg_fetch_object(), pg_num_rows(), pg_num_fields(), pg_affected_rows(), pg_num_rows(), pg_free_result()), Insertion and Deletion of data using PHP, Displaying data from PostgreSQL database in webpage.

Introduction to AJAX - Implementation of AJAX in PHP - Simple example for partial page update.

Textbook

1. HTML 5 Blackbook, Dreamtech Press, ISBN 9879351199076, 2016 Edition.
2. W. Gilmore, Beginning PHP and PostgreSQL 8: From Novice to Professional , Goels Computer Hut (2007), ISBN: 9788181286000

Reference

1. HTML 5 Blackbook, Dreamtech Press, ISBN 987-93-5119-907-6, 2016 Edition.
2. Jon Duckett, Beginning Web Programming with HTML,XHTML, CSS, Wrox.
3. Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley.
4. PostgreSQL Official Documentation Online

Principles of Software Engineering

BCA5B10 Principles of Software Engineering

UNIT I [13T]

Software and Software Engineering: Overview of Software Engineering, Practice & Myths; Software Process; Generic process model- Framework Activity, Task Set, Process Patterns, Process

Improvement; SDLC , Prescriptive process model- Waterfall Model, Spiral Model, Incremental Process Model, Evolutionary Process Model; Specialized Process Models: Component Based Development, the Formal Methods Models;



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Agile development-Agile Process; Extreme Programming; Other Agile Process Models – ASD, Scrum, DSDM, FDD, LSD, Agile Modeling, Agile Unified Process..

UNIT II [13T]

Requirements Engineering- Establishing the Groundwork- Eliciting Requirements - Developing use cases - Building the requirements model - Negotiating, validating Requirements - Requirements Analysis- Requirements Modeling Strategies.

UNIT III [14T]

MODELING WITH UML: Concepts and Diagrams - Use Case Diagrams - Class Diagrams - Interaction Diagrams - State chart Diagrams – Activity Diagrams - Package Diagrams - Component Diagrams - Deployment Diagrams -Diagram Organization- Diagram Extensions. Design ProcessDesign concepts: Abstraction, Architecture, patterns, Separation of Concerns, Modularity,

Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object Oriented Design Concepts, Design Classes- Design Model: Data, Architectural, Interface, Component, Deployment Level Design Elements.

UNIT IV [11T]

Structured coding Techniques-Coding Styles - Standards and Guidelines-Documentation Guidelines- Modern Programming Language Features: Type checking-User defined data types-Data Abstraction Exception Handling - Concurrency Mechanism.

UNIT V [13T]

TESTING: Software Quality- Software Quality Dilemma- Achieving Software Quality- Testing:

Strategic Approach to software Testing- Strategic Issues - Testing: Strategies for Conventional Software, Object oriented software, Web Apps-Validating Testing- System Testing- Art of Debugging.

MAINTENANCE: Software Maintenance-Software Supportability- Reengineering - Business Process Reengineering- Software Reengineering- Reverse Engineering - Restructuring- Forward

Engineering- Economics of Reengineering

Textbooks

1. Roger S, “Software Engineering – A Practitioner’s Approach”, seventh edition, Pressman, 2010.
2. Pearson Education, “Software Engineering by Ian Sommerville”, 9th edition, 2010.



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3. Roff: UML: A Beginner’s Guide TMH

Reference books

1. Hans Van Vliet, “Software Engineering: Principles and Practices”, 2008.
2. Richard Fairley, “Software Engineering Concepts”, 2008.
3. RohitKhurana, Software Engineering: Principles and Practices, 2nd Edition, Vikas Publishing House Pvt Ltd.
4. PankajJalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House.
5. Alhir, learning UML, SPD/O’Reily

Introduction to Computers and Office Automation

BCA5D01 Introduction to Computers and Office Automation

Unit I [12T]

Introduction to Computers: Types of Computers - DeskTop, Laptop, Notebook and Netbook. Hardware: CPU, Input / Output Devices, Storage Devices – System - Software - Operating Systems, Programming Languages, Application Software - Networks - LAN, WAN - Client - Server.

Unit II [12T]

Documentation Using a Word Processor (OpenOffice Writer / M.S. Word) - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features

- Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.



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Unit III [12T]

Electronic Spread Sheet (Open Office Calc/MS-Excel) - Introduction to Spread Sheet, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advanced features – Pivot table & Pivot Chart, Linking and Consolidation.

Unit IV [12T]

Presentation using (OpenOffice Impress/MS-Power Point): Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

References:

1. Michael Miller, Absolute Beginner’s Guide to Computer Basics, Prentice Hall.
2. Russell A. Stultz, Learn Microsoft Office, BPB Publication.
3. H.M.Deitel, P. J. Deitel, et al., Internet & World Wide Web - How to program, Prentice

Web Designing

BCA5D02 - Web Designing

Unit I [12T]

HTML: Introduction - history of html, sgml - structure of html document, web page layout, html tags and types - font type, paragraph formatting, meta data, blockquote, hyperlinks, linking, comments, white space, horizontal ruler, images, ordered and unordered lists, frames, tables, forms

Unit II [12T]

DHTML: Introduction, DHTML technologies, elements of DHTML, document object model, events - window events, form events, keyboard events, mouse events, style sheets, properties used in style sheets - background properties, positioning properties.

Unit III [12T]



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Javascript: Introduction and advantages of javascript, java script syntax, writing javascript in html, javascript operators, arrays and expressions, programming constructs - for .. in loop, while loop - dialog boxes and prompts - alert, prompt, confirm methods - functions - built-in functions and user defined functions, scope of variables, handling events, using event handlers and event methods,

form object, properties, methods, form element's properties and methods.

Unit IV [12T]

HTML Editor: Introduction, advantages, creating, opening, saving a web page, building forms, formatting and aligning text and paragraph, adding lists, styles and themes, linking pages, working

with images, frames.

Reference:

1. H. M. Dietel, Internet and World Wide Web, Pearson.

Introduction to Problem Solving and C Programming

BCA5D03 Introduction to Problem Solving and C Programming

Unit I [12T]

Introduction: The problem solving aspect, Top-down design, Implementation of algorithms, Program verification, efficiency of algorithms. Introduction to C Programming, overview and importance of C, C Program Structure and Simple programs, Creation and Compilation of C Programs under Linux and Windows Platforms.

Unit II [12T]

Elements of C Language and Program constructs, Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable declaration and assignment of values, Symbolic constant definition. C-Operators, Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations.



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Unit III [12T]

Decision making, Branching and Looping, Decision making with IF statement, Simple IF statement, If..else statement, Nesting of If..else and else...if Ladder, Switch statement, Conditional operator, Go-to statement. Looping: While loop, Do-While, and For Loops, Nesting of loops, jumps

in loop, skipping of loops.

Unit IV [12T]

Array & Strings - One dimensional array, two dimensional array and multidimensional array, strings and string manipulation functions. Structures & Union structure definition, giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, CSC-fields.

References:

1. Balaguruswami, Programming in ANSI C
2. Brian W. Kernighan & Dennis M. Ritchie, The C Programming Language
3. Yashvant P. Kanetkar, Let Us C
4. ByranGotfried, Programming with C, Schaums Outline Series

Introduction to Data Analysis using Spread sheet

BCA5D04 Introduction to Data Analysis using Spread sheet

Unit I [12T]

Introduction to MS Excel and Understanding Basic Working with it: Quick review on MS Excel Options, Ribbon, Sheets, Difference between Excel 2003, 2007, 2010 and 2013- Saving Excel File as PDF, CSV and Older versions - Using Excel Shortcuts - Copy, Cut, Paste, Hide, Unhide, and Link the Data in Rows, Columns and Sheet Using Paste Special Options - Formatting Cells, Rows, Columns and Sheets - Protecting & Unprotecting Cells, Rows, Columns and Sheets with or without Password - Page Layout and Printer Properties - Inserting Pictures and other objects in Worksheets



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Unit II [12T]

Introduction to Pivot table: Use multiple pivot tables and pivot charts to create dashboard, Connect multiple slicers to the pivot tables.

Unit III [12T]

Pivot table applications in analytics: filter the data shown in the pivot in different ways to achieve subsets of the data, Use calculated fields on top of the pivot table to calculate profitability and find anomalies.

Unit IV [12T]

Formulae and Function: Use formulas to aggregate the data as an alternative to pivot tables for more flexible reporting layouts. Usage of multiple tables in a single pivot, introduction to data table.

Text Books:

1. Winston, Microsoft Excel 2013: Data Analysis and Business Modeling, Prentice Hall India Learning Private Limited (2013), ISBN: 9788120349605

References:

1. John Walkenbach, Microsoft Excel 2013 Bible, Wiley (23 April 2013), ISBN: 9788126541720.
2. Paul McFedries, Excel 2013 Formulas and Function 1st Edition, Pearson India (2014), ISBN: ISBN: 9789332524026



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Android Programming

BCA6B11 Android Programming

Unit I [13T+3L]

Introducing the android computing platform, History of android, android software stack, Developing end user application using Android SDK, Android java packages, Setting up the development environment, Installing android development tools (ADT), Fundamental components, Android virtual devices, Running on real device, Structure of android application, Application life

cycle.

Unit II [13T+3L]

Understanding android resources - String resources, Layout resources, Resource reference syntax, Defining own resource IDs - Enumerating key android resources, string arrays, plurals, Colour resources, dimension resources, image resources, Understanding content providers - Android built in

providers, exploring databases on emulator, architecture of content providers, structure of android content URIs, reading data using URIs, using android cursor, working with where clause, inserting

updates and deletes, implementing content, Understanding intents basics of intents, available intents, exploring intent composition, Rules for Resolving Intents to Their Components, ACTION PICK,

GET CONTENT, pending intents

Unit III [13T+3L]

User interfaces development in android - building UI completely in code, UI using XML, UI in XML with code, Android's common controls - Text controls, button controls, checkbox control, radio button controls, image view, date and time controls, map view control, understanding adapters,

adapter views, list view, grid view, spinner control, gallery control, styles and themes, Understanding layout managers - linear layout manager, table layout manager, relative layout manager, frame layout manager, grid layout manager.

Unit IV [13T+3L]

Android menus - creating menus, working with menu groups, responding to menu items, icon menu, sub menu, context menu, dynamic menus, loading menu through XML, popup menus, Fragments in Android structure of fragment, fragment life cycle, fragment transaction and back stack, fragment



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manager, saving fragment state, persistence of fragments, communications with

fragments, startActivity() and setTargetFragment(), using dialogs in android, dialogfragments, workingwith toast, Implementing action bar - tabbed navigation action bar activity, implementing base activity classes, tabbed action bar and tabbedlistener, debug text view layout, action bar and menu interaction, list navigationaction bar activity, spinner adapter, list listener, list action bar, standard navigationaction bar activity, action bar and search view, action bar and fragments.

Unit V [12T+4L]

Persisting data - Files, saving state and preferences - saving application data, creating, saving and retrieving shared preferences, preference framework and preference activity, preference layout in XML, native preference controls, preference fragments, preference activity, persisting the

application state, including static files as resources, Working with file system, SQLite - SQLite types, database manipulation using SQLite, SQL and database centric data model for Android,

Android database classes.

References:

1. Satya Komatineni & Dave MacLean, Pro Android 4, Apress.
2. Retomeier, Professional Android 4 Application Development, Wrox.
3. Zigurd Mednieks, Laird Dornin, G. Blake Meike, and Masumi Nakamura, Programming Android, O'Reill

BCA6B12- Operating Systems

BCA6B12- Operating Systems

Unit I [12T + 4P]

Operating System - Objectives and functions - The Evolution of Operating Systems: Serial Processing, Simple batch Systems, Multi Programmed batch Systems, Time Sharing Systems, Parallel Systems, Distributed Systems, Real



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time systems. Definition of Process, Process States, Process Control Block, Operations on Process, Process Communication, Communication in Client server System, Basic concepts of threads, Concurrency, Principles of Concurrency, Mutual exclusion, Semaphores, Messages, Dead lock: Prevention, Detection, Avoidance.

Unit II [13 T + 3P]

Linux Shell Programming: Introduction – Shells available in Unix: Bourne shell (sh), C shell (csh), TC shell (tcsh), Korn shell (ksh), Bourne Again SHell (bash). Bash: special characters – getting help – man pages – Linux Directory Layout – Command for Navigating the Linux Filesystems: pwd, cd, ls, file, cat, cp, mv, mkdir, rmdir, whereis – Piping and Redirection - Informational Commands: ps, w, id, free – clear, echo, more. File permissions – Setting Permissions – Making a file executable. Creating shell programs: comments, variables, operators (arithmetic, relational, logical) – single and double quotes - read – echo – test - conditional commands, iterative commands – break – continue - evaluating expressions using expr, bc – strings – grep – arrays.

Unit III [13T + 3P]

CPU Scheduling: Scheduling Criteria, Scheduling algorithms: FCFS, SJF, Priority, RR, Multilevel, Feedback Queue - Process synchronization, The Critical Section Problem, Synchronization Hardware, Classical Problems of Synchronization: Reader Writer, Dining Philosopher. File and Database System, File System, Functions of organization, Allocation and Free Space Management.

Unit IV [13T + 3P]

Memory Management, Address Binding, Logical Vs Physical Address Space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand Paging, Page Replacement, Thrashing.

Unit V [13 T + 3 P]

Protection and security: policy and mechanism, authentication, authorization. Mobile OS: Concepts, history, features, architecture, future scope. Case studies: Android, UNIX kernel and Microsoft

Windows NT (concepts only).

Text Books

1. Silberschatz, Galvin and Gagne, Operating System Concepts, John Willey & Sons
2. William Stallings, Operating Systems, Internals and Design Principles, PHI
3. Mendel Cooper, Advanced Bash-Scripting Guide, Available at



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<http://www.tldp.org/LDP/abs/abs-guide.pdf>

References:

4. Nutt G.J, Operating Systems: A Modern Perspective, Addison Wesley

Computer Networks

BCA6B13 Computer Networks

Unit I [16 T]

Introduction to Computer networks, Topology, categories of networks, Internetwork, Internet, Network Models, Layered model, OSI and TCP/IP models, Physical layer, Switching - Circuit

switching, Packet Switching and Message Switching, DTE - DCE Interface, EIA - 232 interface,

X.21 modems.

Unit II [16T]

Data link layer, Error detection and correction, Types of errors, Single CSC error and Burst error, Vertical redundancy check (VRC), longitudinal redundancy Check (LRC), Cyclic Redundancy Check(CRC), Error correction - Single CSC error correction, Hamming code Data compression - Huffman code, data link control, Line discipline, Flow control, Error control, Multiple Access,

Random Access, ALOHA, pure ALOHA and slotted ALOHA, CSMA/CD and SCMA/CA, Polling, Wired LANs, Ethernet - IEEE standards, Wireless LANs.

Unit III [16T]

Network layer, Networking and Internetworking devices - Repeaters, Bridges, Routers, Gateways, Logical addressing - IPv4 & IPv6 addresses, Network Address Translation(NAT), Internet protocols, internetworking, Datagram, Transition from IPv4 to IPv6, Address Mapping- Error reporting and multicasting - Delivery, Forwarding and Routing algorithms, Distance Vector Routing, Link State Routing.

Unit IV [16 T]



CRITERION	I	Curricular Aspects
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Transport layer, Process-to-process Delivery: UDP, TCP and SCTP, Congestion control and Quality of Service, Application Layer, Domain Name Systems-Remote Login-Email FTP, WWW,

HTTP, Introductory concepts on Network management: SNMP.

Unit V [16T]

Cryptography and Network Security: Introduction – Goals of Security – Attacks - Services and Techniques. Basics of Cryptography: Plain Text - Cipher Text – Encryption – Decryption. Confidentiality: Basics of Symmetric Key Ciphers - Traditional Symmetric Key Ciphers: Substitution, Transposition, Stream & Lock, Modern – Components of Modern Block Cipher –DES - Modern Stream Cipher. Basics of Asymmetric Key Ciphers – RSA Cryptosystem. Integrity:

Message – Message Digest – Hash Function. Authentication: MAC. Digital Signature : Analogy with Manual Signature – Process – Signing the Digest – Services – RSA Digital Signature Scheme.

Textbook:

1. Behrouz A Forozan, Introduction to Data Communications & Networking, TMH

References:

1. Andrew S. Tanenbaum, Computer Networks, PHI
2. William Stallings, Data and Computer Communications, VIIth Edition, Pearson Education
3. William Stallings, Cryptography and Network Security, Principles and Practices, Prentice Hall of India.
4. Steven Graham and Steve Shah, Linux Administration: A Beginners Guide, Third Edition, Dreamtech,2003



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Industrial Visit and Project Work

BCA6B17 Industrial Visit and Project Work

The objective of the B.Sc. Computer Science final project work is to develop a quality software solution by following the software engineering principles and practices. During the development of the project the students should involve in all the stages of the software development life cycle

(SDLC). The main objective of this project course is to provide learners a platform to demonstrate their practical and theoretical skills gained during five semesters of study in B.Sc. Computer Science Programme.

During project development students are expected to define a project problem, do requirements analysis, systems design, software development, apply testing strategies and do documentation with

an overall emphasis on the development of a robust, efficient and reliable software systems. The project development process has to be consistent and should follow standard. For example database tables designed in the system should match with the E-R Diagram. SRS documents to be created as

per IEEE standards. Students are encouraged to work on a project preferably on a live software project sponsored by industry or any research organization. Topics selected should be complex and large enough to justify as a B.Sc. Computer Science final semester project. The courses studied by the students

during the B.Sc. Computer Science Programme provide them the comprehensive background knowledge on diverse subject areas in computer science such as computer programming, data structure, DBMS, Computer Organization,

Software Engineering, Computer Networks, etc., which will be helping students in doing project work. Students can also undertake group project to learn how to work in groups. However, the

maximum number of students in a group must be limited to 4.

For internal evaluation, the progress of the student shall be systematically assessed through two or three stages of evaluation at periodic intervals.

A bonafied project report shall be submitted in hard bound complete in all aspects.

Industrial Visit:

Contact Hours per Week: NIL

Number of Credits: 1

Number of Contact Hours: NIL



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Course Evaluation: External – 10 Marks

Guide Lines:

- Minimum one day visit to National research Institutes, Laboratories, places of scientific Importance or Software Companies.

OR

- One week Industrial Training / internship at any software firms/ Research Labs
- The Industrial visit should be done in fifth or sixth semester.
- A 10 – 20 page Industrial visit / Training report have to be submitted with certificate from industry / institute, sufficient photos and analysis along with Project for evaluation in the sixth semester

Machine Learning

BCA6B16B Machine Learning

Unit I [12 T]

Basics of Linear Algebra for ML : Classes of spaces (vector , metric , normed , inner product), Pythagorean Theorem, Type of matrices, Matrix operations, Eigenvector, Fundamental Theorem of

Linear Algebra.

Unit II [13 T]

Foundations of Probability for ML : Probability Theory (Random Variables, Distributions, Mean and Variance, Bayes Rule), Basic Techniques (Naive Bayes,

Nearest Neighbor Estimators, KMeans), Density Estimation (Limit Theorems, Parzen Windows, Exponential Families, Estimation,

Sampling).

Unit III [13 T]



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Introduction to Machine Learning : Applications, Issues in Machine Learning, **Designing a Learning system - Supervised Learning - Unsupervised Learning, Vapnik-Chervonenkis Dimension – Probably Approximately Correct (PAC) Learning- Learning Multiple Classes, Bayesian Decision theory- Classification, Discriminant Functions, Association rules.**

Unit IV [13 T]

Dimensionality Reduction : Subset Selection-Principal Component Analysis-Linear Discriminant Analysis, Clustering- K-means Clustering- Expectation maximization Algorithm- Hierarchical Clustering,

Unit V [13 T]

Parametric and Non-Parametric methods for classification and regression : Parametric methods-Maximum Likelihood Estimation- Baye’s Estimator-Parametric Classification, Regression Non-Parametric methods- Kernel Estimator- K-nearest neighbour estimator, Decision Trees Univariate Trees- Classification trees, Regression trees, Rules extraction from Trees

References

1. Ethem Alpaydin, Introduction to Machine Learning, Second edition, MIT Press, 2010.
2. Alex Smola and S.V.N. Vishwanathan ,Introduction to Machine Learning, Second Edition, Cambridge University Press
3. Jason Brownlee, Basics of Linear Algebra for Machine Learning, First Edition, Machine Learning Mastery, 2018
4. Bishop. C M, Pattern Recognition and Machine Learning. Springer, 2006.
5. Duda, R O, Hart P E and Stork D G. Pattern Classification. Wiley-Interscience, 2nd Edition, 2000.
6. Hastie T, Tibshirani R and Friedman J, The Elements of Statistical Learning: Data Mining, Inference and Prediction. Springer, 2nd Edition, 2009.
7. Mitchell T, Machine Learning. McGraw Hill, 1997.
8. Mohssen Mohammed, Muhammad Badruddin Khan ,Eihab Bashier Mohammed Bashier, Machine Learning Algorithms and applications, CRC Press, First Edition,201



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Software testing & Quality Assurance

BCA6B16C Software testing & Quality Assurance

UNIT I (12T)

Phases of Software project - Quality Assurance, Quality control - Testing, Verification and Validation - Process Model to represent Different Phases - Life Cycle models. White-Box

Testing: Static Testing - Structural Testing Challenges in White-Box Testing.

UNIT II (12T)

Black-Box Testing: What is Black, Box Testing?, Why Black, Box Testing?, When to do Black, Box Testing?, How to do Black, Box Testing?, Challenges in White Box Testing, Integration

Testing: Integration Testing as Type of Testing, Integration Testing as a phase of Testing, Scenario Testing, Defect Bash.

UNIT III (12T)

System and Acceptance Testing: system Testing Overview, Why System testing is done? Functional versus Non, functional Testing, Functional testing, Non, functional Testing,

Acceptance Testing, Summary of Testing Phases.

UNIT IV (12T)

Performance Testing: Factors governing Performance Testing, Methodology of Performance

Testing, tools for Performance Testing, Process for Performance Testing, Challenges.

Regression Testing: What is Regression Testing? Types of Regression Testing, When to do

Regression Testing, How to do Regression Testing, Best Practices in Regression Testing.

UNIT V (12T)

Test Planning, Management, Execution and Reporting: Test Planning, Test Management, Test Process, Test Reporting, Best Practices. Test Metrics and Measurements: Project Metrics,

Progress Metrics, Productivity Metrics, Release Metrics.

REFERENCE BOOKS

1. Software Testing Principles and Practices, Srinivasan



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Desikan&Gopalswamy, Ramesh, Pearson Education.

2. Effective Methods of Software Testing, William E. Perry, Wiley

3. Software Testing, RenuRajani and Pradeep Oak, TMH

4. Software Testing Tools, K. V. K. K. Prasad, Dreamtech Press

5. Introducing Software Testing, LouiseTamres, Pearson Education

Technical Writing

BCA6B16D Technical Writing

Unit I [13 T]

Basics of Technical Communication: Technical Communication - features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; the flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Barriers to Communication.

Unit II [13 T]

Constituents of Technical Written Communication: Word formation, Prefix and Suffix; Synonyms and Antonyms; Homophones; One Word Substitution; Technical Terms; Paragraph Development: Techniques and Methods -Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation- various steps.

Unit III [12 T]

Forms of Technical Communication - Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order, Claim and Adjustment Letters; Memos, Notices, Circulars; Job

application and Resumes.

Unit IV [13 T]

Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance, Technical Paper, Project, Dissertation and Thesis Writing. E-Media: E-mail – E-Newsletter – Blogging – E-Magzines – Social Networks.

Unit V [13 T]



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Soft Skills: Presentation Strategies - Preparing a Presentation – Body Language – Voice Dynamics – Handling Questions.

Text Books

1. Professional Communication: For GautamBuddh Technical University & Mahamaya Technical University, Pearson Education India.
2. Phillip A. Laplante, Technical Writing: A Practical Guide for Engineers and Scientists (What Every Engineer Should Know), CRC Press.

References

1. Gerald J. Alred ,Charles T. Brusaw, Walter E. Oliu, Handbook of Technical Writing, Tenth Edition.
2. Gary Blake and Robert W. Bly, The Elements of Technical Writing, New York: Macmillan Publishers.
3. Hackos, JoAnn T., Managing Your Documentation Projects. Wiley, 1994

Fundamentals of Life Skill Education

BCA6B16E Fundamentals of Life Skill Education

Unit I [13 T]

Introduction to life skill education, definition, components, pillars of learning, need for life skill training, approaches - critical thinking skills/decision making skills, interpersonal/communication skills, criteria for using life skills.

Unit II [13 T]

Communication skills, communication, definition , components- sender, message, channel , receiver, feedback, types of communication, effective interpersonal communication, barriers, communication noise, listening, ways to improve interpersonal communication, effective public



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speaking interview, group discussion

Unit III [13 T]

Career planning, career planning steps, choosing a career, career development, career guidance and career guidance centre, need and importance of career guidance, career guidance centre and

sources, making a career decision, preparing a resume and tips

Unit IV [12 T]

Self management, self esteem, definitions, practice self acceptance, practice self acceptance characteristics of people with high self-esteem, low self esteem, characteristics and causes, self-esteem building, self awareness importance, develop self awareness, self control, developing self control, emotional intelligence or emotional quotient, emotional quotient , two aspects of emotional intelligence, five domains of emotional eq or ei, social intelligence, coping with emotions, emotional intelligence,

Unit V [13 T]

Stress and strain: concept of stress, meaning and definition of stress, types of stress, major symptoms of stress, manage everyday stress. strain-mental strain, causes of strain, conflict, conflict resolution, understanding conflict in

relationships, emotional awareness, managing and resolving conflict, stages of healthy conflict resolution, styles of conflict resolution, styles of dealing with

conflict, developing positive thinking, positive and negative self-talk, better self-talk, impacts , assertiveness, behaviour , importance of assertive behaviour.

Text Books

1. ShaliniVerma, Development of Life Skills and Professional Practice , Vikas Publishing House; First edition (2014)

References:

1. Dr. K. RavikanthRao and Dr. P. Dinakar, Life Skills Education, Neelkamal; First edition (2016)
2. http://www.universityofcalicut.info/SDE/opencourses/Life_skill_education.pdf



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Computer Fundamentals

CSC1C01 Computer Fundamentals

UNIT I [7T+6L]

Number systems- Non-positional number systems and positional number systems (Binary, Octal and Hexadecimal), Converting from one number system to another- decimal to a new base, converting to decimal from another bases, converting from base other than ten to base other than ten, short cut method for converting from binary to octal, octal to binary, binary to hexadecimal and hexadecimal to binary, Computer Codes (BCD, EBCDIC, ASCII) error detecting and correcting codes, parity bit, Hamming Code, computer arithmetic ,importance of binary, binary addition and

subtraction.

UNIT II [6T+7L]

Boolean Algebra and Logic circuits- fundamental concepts of Boolean Algebra, postulates, Principle of duality, theorems of Boolean Algebra, Boolean functions, minimization, complement, canonicals forms, conversion between canonical forms. Logic Gates- AND, OR, NOT, NAND, NOR, XOR and XNOR, logic circuits, converting expression to logic circuit, universal NAND and NOR gates, Exclusive OR and equivalence functions, Design of Combinational circuits (Half Adder, Subtractor and Full Adder)

UNIT III [6T+7L]

Basic Computer Organization-Input Unit, Output Unit, Storage Unit (Direct, Sequential and Random Access), CPU organization, Control Unit (micro programmed and hardwired control), primary storage, memory hierarchy, storage locations and addresses, storage capacity, bit, byte,

nibble, RAM, ROM, PROM and EPROM, cache memory, registers. Secondary storage devices (Magnetic tape, Hard disk and CD drive)

UNIT IV [7T+6L]

I/O devices - Input Devices-identification and its use, keyboard, pointing devices (mouse, touch pad and track ball), Video digitizer, remote control, joystick, magnetic stripes, scanner, digital camera, microphone, sensor, and MIDI instruments, Output Devices identification and its use, monitor,

printer (laser, inkjet, dot-matrix), plotter, speaker, control devices (lights, buzzers, robotic arms, and motors)

UNIT V [6T+6L]



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Planning a Computer program, purpose of program planning, algorithm, flowchart - symbols, sample flowcharts, advantages and limitations.

Text Books:

1. Pradeep K. Sinha and Priti Sinha, Computer Fundamentals, BPB

References:

1. Peter Nortorn, Introduction to Computer, TMH
2. Rajaraman, V, Fundamental of Computers, Prentice Hall India
3. B. Ram, Computer Fundamentals

Fundamentals of System Software Networks and DBMS

CSC2C02 Fundamentals of System Software Networks and DBMS

UNIT I [6 T+6L]

System software - classification of programming languages (Machine, assembly & High level), Characteristics and Comparison, language processors (Assembler, Interpreter and Compiler), Operating Systems- Functions, types of OS (batch, multiprogramming, time sharing, real time and distributed)

UNIT II [7 T+6L]

Computer networks- goals of networking, network topologies, types of networks (LAN, MAN and WAN), network model, OSI model- 7 layers, Internet Layer- 5 layers, Communication Media Guided (Twisted Pair, Coaxial Cable and Fiber Optic) and Unguided (microwave, satellite).

UNIT III [6 T+7L]

Database Management Systems-definition, structure of Database, data models (Record based Data model, Network model: - Basic Components, Record types, data types, links, relationships, Hierarchical model and Relational model)

UNIT IV [6 T+7L]

Structured query language - Create, insert, select, update, delete, alter, drop commands



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UNIT V [7 T+6L]

HTML-hypertext, hyper media, understanding basic HTML tools- HTML editor, web browser, General structure of HTML document, different types of elements-doc type, comment element, structural element, HTML tags and attributes: <html>, <body>, <head>,<title>, <h1>,... ,<h6>,
, <table>, , <hr>, adding links, background image to the body,creating lists.

References:

1. P. K Sinha, Fundamentals of Computers
2. D. M Dhamdhere, Operating System: A concept based Approach
3. Behrouz A Forouzan, Data Communication & Networking, MC Graw Hill
4. Joel Sklar, Principles of Web Page Design, Vikas Publications

Problem Solving Using C

CSC3C03 Problem Solving Using C

UNIT I [9 T+7L]

Introduction to C- Structure of C program, Character Set, Keywords, Identifiers, Data Types, Qualifiers, Variables, Declarations, Symbolic Constants, Expressions, Statements, Different Types of Operators (Arithmetic, Logical, Relational & Equality, Unary and Conditional), Operator Precedence and Associativity, Library Functions, Comments, I/O functions-(Formatted scanf() &printf(), getchar (), putchar (), getche(), gets(), puts())

UNIT II [9 T+7L]

Control Statements- Selection Statements (if, if-else, else if ladder, switch), iteration (while, do while, for), jumping (goto, break, continue), Nested Control Statements

UNIT III [10 T+6L]

Structured Data types - Arrays (One dimensional and Two Dimensional), Character and String Functions, Structure (Definition, Processing-period Operator), Union



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UNIT IV [10 T+6L]

User defined Functions - Advantages, Definition, Accessing functions, formal and Actual Parameters, Recursion, Storage Classes- Automatic, External, Static and Register Variable, Argument Passing Mechanism

UNIT V [11T+6L]

Pointers and data files- Pointers, advantages, declaration, operations on pointers, pointers and one dimensional arrays, dynamic memory allocation. Data files (sequential), file handling functions (fopen(), fclose(), fputc(), fgetc(), fgets(), fputs(), fscanf(), fprintf())

Text Book:

1. E Balagurusamy, Programming in Ansi C, Tata McGraw Hill

References:

1. Byran Gotfried, Programming with C, Schaum Series
2. Kezningham & Ritchie, Programming in C
3. Yashvant Kanetkar, Let us C, BPB publications
4. Mullish Cooper, The spirit of C, Jasco books
5. Herbert Schildt, The Complete reference C, Tata McGraw Hill



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Data Structure Using C

CSC4C04 Data Structure Using C

Unit I [11 T+6L]

Primitive Data types and Abstract Data Types(ADT) - Introduction to data structures – definition - characteristics of data structures - categories of data structures – **algorithm - space complexity and time complexity of an algorithm (concept only).**

Unit II [7 T+6L]

Arrays and Singly Linked Lists - 1D, 2D and Multi-dimensional arrays – operations on arrays - Sparse matrix Representation

Unit III [9 T+7L]

Lists- Linked List- Definition –Creation- Operations, Basics of Doubly Linked List, Circular Linked List.

Unit IV [11 T+7L]

Stack and Queues – Definition and Operations on stack - Implementation of Stack using arrays and linked lists - Applications of Stacks - Polynomial Addition

Queues – Definition, Implementations of queue using arrays and linked lists – basics of Circular queue, Dequeue - Applications of queues.

Unit V [10 T+7L]

Searching and Sorting: Searching: Linear search & Binary search.

Sorting – Linear sort - Bubble sort - Selection sort - Insertion sort - Quick sort - Merge sort – Comparisons and implementations.



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Text Books:

1. Seymour Lipschutz, “Data Structures”, Tata McGraw Hill Publishing Company Limited, Schaum’s Outlines, New Delhi.
2. Yedidyan Langsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, “Data Structures Using C”, Pearson Education., New Delhi.
3. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., New Delhi.

Reference Books:

1. Trembley, J.P. And Sorenson P.G., “An Introduction to Data Structures With Applications”, McGraw- Hill International Student Edition, New York.
2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Addison- Wesley, (An Imprint of Pearson Education), Mexico City



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Computer Fundamentals and HTML

BCS1B01 Computer Fundamentals and HTML

Unit I[4 T]

Concepts of Hardware and Software: Computer Languages, Language Translators, Features of good language, Basics Computer Organization: Von Neumann Model, Input Unit, Output Unit, Storage Unit, Control Unit, Memory Hierarchy, Primary Storage, Cache Memory, Registers, Secondary Storage Devices, **Basics of Hardware Components – SMPS, Motherboard, Add-on**

Cards, Ports, Memory, Adapters, Network cables, Basic Computer Configuration

Unit II [5 T]

Number Systems and Boolean Algebra – Decimal, Binary, Octal and Hexadecimal Numbers, Arithmetic involving Number Systems, Inter Conversions of Number Systems, 1's and 2's Complements, Complement Subtractions, Digital Codes – Binary Coded Decimal (BCD),

ASCII Code ,Unicode, Gray Code, Excess-3 Code. Boolean Algebra: Boolean Operations, Logic Expressions, Postulates, Rules and Laws of Boolean Algebra, DeMorgan's Theorem, Minterms, Maxterms, SOP and POS form of Boolean Expressions for Gate Network, Simplification of Boolean Expressions using Boolean Algebra and Karnaugh Map Techniques (up to 4 variables)

Unit III [3 T]

Fundamentals of Problem Solving – The Problem Solving Aspect, Top-down Design, Definition –Algorithm, Flowchart, Program - Properties of Flowcharts – Flowchart Symbols for Designing Application Programs, Sample Algorithms – Sum, Average, Finding Smallest Number, Checking Odd/Even Number, Prime Number, Quadratic Equation

Unit IV [2T + 16L]



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Basics of Web Design – www, W3C, Web Browser, Web Server, Web Hosting, Web Pages, DNS, URL, Introduction to HTML, XHTML, DHTML, HTTP.

Overview of HTML 5 – Basic Formatting Tags: heading, paragraph, break, underline, bold, italic, superscript, subscript, font and image, attributes: align, color, bgcolor, font face, border, size, navigation links using anchor tag: internal, external, mail and image, lists: ordered, unordered and definition, HTML media tags: audio and video

Unit V [2T+16L]

Creating Simple Tables: row, col, heading, cell, border, spanning – Form Controls: Input types –text, password, text area, button, checkbox, radio button, select box, hidden controls, frames and frame sets

CSS: Introduction - Concept of CSS, Creating Style Sheet: inline and internal, CSS Properties, CSS Styling: Background, Text Format, Controlling Fonts - Working with Block Elements and Objects,

CSS ID and Class

Text Books

1. Sinha. P.K, Computer Fundamentals, BPB Publications
2. Ram. B, Computer fundamentals, New Age International Pvt. Ltd Publishers
3. Rajaraman V and Radhakrishnan, An introduction to Digital computer Design, PHI,
4. HTML 5 Blackbook, Dream Tech Press,2016 Edition

Reference Books

1. Thomas L Floyd, Digital Fundamentals, Universal Book Stall
2. Bartee T.C, Digital Computer Fundamentals, TH



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Problem Solving Using C

BCS2B02 Problem Solving Using C

Unit I [3T+ 3L]

Introduction to C Programming - Overview and Importance of C, C Program Structure, Sample programs. Familiarization of Integrated Development Environment - Invoking IDE, Opening a new window in IDE, Writing, Saving and Compiling a C program, making an Executable File. Elements of C Language and Program Constructs: Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable Declaration and Assignment of Values, Symbolic Constant Definition.

Unit II [2T+ 6L]

C Operators - Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations -

Library functions.

Unit III [3T + 7L]

Data input output functions - Simple C programs – Flow of Control - Decision making with IF statement, Simple IF statement, If-else statement, Nesting of If-else and else-if Ladder, Switch statement, Conditional operator, goto statement. Looping - While loop, Do-While, and For Loops, Nesting of loops, jumps in loop, skipping of loops.

Unit IV [4T+ 8L]

Arrays and Strings - One dimensional array, two dimensional and multi-dimensional arrays, strings and string manipulation functions. The Concept of modularization and User defined functions - Definition - Multifunction Program, proto-types, Passing arguments, calling functions, various categories of functions, Nesting of functions and recursion, functions and arrays, scope and lifetime of variables in functions, multi-file



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programs. Structures & Union structure definition - giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit fields.

Unit V [4T+8L]

Pointers - Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string, pointers and functions, pointers and structures, pointer to pointer dynamic memory allocation. Files: Creating, Processing, Opening and Closing a data file, command line operations

Textbook:

1. Balaguruswami. E, Programming in ANSI C, Tata McGraw-Hill Education, 2008

References

1. Brian W. Kernighan & Dennis M. Ritchie, The C Programming Language, Prentice Hall, 2nd Edition 1998
2. Yashavant P. Kenetkar, Let us C
3. ByranGotfried, Schaums Outline series Programming with C
4. Ashok N. Kamthane, Programming in C, Pearson, 2nd Edition



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Python Programming

XXXXA11 Python Programming

UNIT I [16T]

Introduction to python, features, IDLE, python interpreter, Writing and executing python scripts, comments, identifiers, keywords, variables, data type, operators, operator precedence and associativity, statements, expressions, user inputs, type function, eval function, print function.

UNIT II [16T] Boolean expressions, Simple if statement, if-elif-else statement, compound boolean expressions, nesting, multi way decisions. Loops: The while statement, range functions, the for statement, nested loops, break and continue statements, infinite loops.

UNIT III [16T]

Functions, built-in functions, mathematical functions, date time functions, random numbers, writing user defined functions, composition of functions, parameter and arguments, default parameters, function calls, return statement, using global variables, recursion.

UNIT IV [16T]

String and string operations, List- creating list, accessing, updating and deleting elements from a list, basic list operations. Tuple- creating and accessing tuples in python, basic tuple operations. Dictionary, built in methods to access, update and delete dictionary values. Set and basic operations on a set.

References:

1. E. Balaguruswamy, Introduction to Computing and Problem Solving Using Python
2. Richard L. Halterman, Learning To Program With Python
3. Martin C. Brown, Python: The Complete Reference



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Data Communication and Optical Fibers

XXXXA12– Data Communication and Optical Fibers

Unit I [16T]:

Introduction- **Components**, Networks, Protocols and standards, Basic Concepts: Line Configuration, Topology Transmission mode, analog and digital signals, Encoding and modulating analog-to-digital conversion, digital to analog conversion, digital data transmission, DTE-DCE interface, **modems, cable modems**. **Transmission media: guided media, unguided media**, and transmission impairment.

Unit II [16T]

Multiplexing: Many to one/ one to many, frequency division multiplexing, wave division multiplexing, TDM, multiplexing applications: **the telephone system, Cellular System, Mobile Communication-GSM, Mobile Services, GSM system Architecture, Radio Interface in GSM**

Unit III [16T]

Data link Control: Line Discipline, flow control, error control, Data link Protocols: Asynchronous Protocols, synchronous protocols, character oriented protocols, bit – oriented protocols, link access procedures. **Local Area Networks: Ethernet, token bus, token ring, FDDI, Comparison, Switching circuit switching, packet switching, message switching, integrated services digital networks (ISDN): services, history, subscriber access to ISDN.**

Unit IV [16T]

Overview of Optical Fiber Communication - Introduction, historical development, general system, advantages, disadvantages, and applications of optical fiber communication, optical fiber waveguides, fiber materials, Optical Sources And Detectors- **Introduction, LED's, LASER diodes,**



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Photo detectors. Ray theory, **cylindrical fiber, single mode fiber**, cutoff wave length, mode field

diameter.

Text Book:

1. Behrouz A. Forouzan, Data Communication and Networking, TMH
2. Mobile Communications – Jochen H. Schiller , Second Edition ,Pearson
3. Optical Fiber Communication – Gerd Keiser, 4th Ed., MGH, 2008.

Reference Books:

1. William Stallings: Data & Computer Communications, 6/e, Pearson Education.
2. William L. Schweber : Data Communication, McGraw Hill.
3. Electronic Communication Systems - Kennedy and Davis, TMH
4. Optical Fiber Communications– – John M. Senior, Pearson Education. 3rd Impression,2007.
5. Fiber optic communication – Joseph C Palais: 4th Edition, Pearson Education

Data Structures Using C

BCS3B04 – Data Structures Using C

UNIT I [9 T + 7L]

Introduction: Elementary data organization, Data Structure definition, Data type vs. data structure, Categories of data structures, Data structure operations, **Applications of data structures, Algorithms**

complexity and time-space trade off, Big-O notation.



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Strings: Introduction, strings, String operations, Pattern matching algorithms

UNIT II [10 T + 14 L]

Arrays: Introduction, Linear arrays, Representation of linear array in memory, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, sparse matrix.
Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular linked list, Two-way

linked list, Applications of linked lists, Algorithm of insertion/deletion in Singly Linked List (SLL).

UNIT III [10 T + 14 L]

Stack: primitive operation on stack, algorithms for push and pop. Representation of Stack as Linked List and array, Stacks applications: polish notation, recursion. Introduction to queues: Primitive Operations on the Queues, Circular queue, Priority queue, Representation of Queues as Linked List and array, Applications of queue: Algorithm on insertion and deletion in simple queue and circular queue.

UNIT IV [10 T + 14 L]

Trees - Basic Terminology, representation, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree: insertion, deletion and processing, Traversal of binary trees: In order, Pre-order & post-order, Algorithm of tree traversal with and without recursion, Binary Search Tree, Operation on Binary Search Tree, expression trees, implementation using pointers, applications.

UNIT V [10 T + 14 L]

Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, graph traversal- depth-first and breadth-first traversal of graphs, applications. Searching: sequential searching, binary searching, Hashing – linear hashing, hash functions, hash table searching; Sorting: Quick Sort, Exchange sort, Selection sort and Insertion sort.

TEXT BOOKS



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1. Seymour Lipschutz, “Data Structures”, Tata McGraw- Hill Publishing Company Limited,
Schaum’s Outlines, New Delhi.
2. YedidyanLangsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, “Data Structures Using C”, Pearson Education., New Delhi.
3. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd.,
NewDelhi.

REFERENCE BOOKS

1. Trembley, J.P. And Sorenson P.G., “An Introduction to Data Structures With Applications”,
Mcgraw- Hill International Student Edition, New York.
2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Addison- Wesley, (An
Imprint of Pearson Education), Mexico City.
3. A.K.Sharma, Data Structures Using C, Pearson, Second edition, 2011
4. Nair A.S., Makhalekshmi, Data Structures in C, PHI, Third edition 2011.
5. R. Kruse etal, “Data Structures and Program Design in C”, Pearson Education Asia, Delhi2002
6. K Loudon, “Mastering Algorithms with C”, Shroff Publisher & Distributors Pvt. Ltd



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Microprocessors Architecture and Programming

BCS4BA13 Microprocessors Architecture and Programming

Unit I [16 T]

General architecture of computer, Introduction to Microprocessor, Memory classification, Introduction to 8085, Microprocessor bus organizations, data bus, address bus, control bus. Memory addressing, memory mapping. 8085 architecture in detail. General purpose registers and special purpose registers, flag register -8085 pins and signals.

Unit II [16 T]

Assembly language programming basics. Opcode, Mnemonics etc. 8085 instruction set, Data transfer, Arithmetic and Logic, Shifting and rotating, Branching/Jump, Program control. Addressing modes. Memory read and write cycle. Timing diagram. Instruction cycle, machine cycle and T-states. Types of I/O addressing. Simple programs.

Unit III [16 T]

Types of programming techniques looping, indexing (pointers), delay generation. Stack in 8085, call and return Instructions. Data transfer between stack and microprocessor. Subroutine and delay programs. Interrupts in 8085. Interrupt driven programs. **Interfacing - Programmable peripheral devices - 8255A, 8254, 8237.**

Unit IV [16 T]

Introduction to 8086/88 microprocessors – overview, 8086 internal architecture. The execution unit, BIU, Registers, Flags, Segmentation, physical address calculation, addressing modes.

Text Book:

1. Ramesh S. Gaonkar, Microprocessor Architecture Programming and Application with 8085, Prentice Hall
2. Doughles V Hall, Microprocessors and Interfacing: Programming and Hardware, Tata



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McGraw Hill

Reference Book:

1. Microprocessor and Microcomputer - Based system Design - M. Rafiquzzman - CRC press
- 2.A.P Mathur, Introduction to Microprocessors, Tata McGraw-Hill Education
3. The Intel Microprocessors: 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro, Pentium II, III, IV and Core 2 with 64 bit Extensions, Barry B. Brey, Prentice Hall Pearson
4. Microprocessors PC Hardware and Interfacing –N.Mathivanan – PHI

Sensors and Transducers

BCS3BA13 Sensors and Transducers

Unit I [16 T]

Transducers: Definition, Principle of sensing & transduction, Classification, Characteristics of transducers. Basic requirement of transducers.

Resistance Transducer: Basic principle – Potentiometer –Loading effects, Resistance strain gauge– Types. Inductance Transducer: - Basic principle – Linear variable differential transformer – RVDT types. Capacitance Transducer: Basic principle- transducers using change in area of plates –distance between plates- variation of dielectric constants –Types

Unit II [16 T]

Thermal sensors: Resistance change type: RTD - materials, construction, types, working principle, Thermistor - materials, construction, types, working principle, Thermo emf



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sensors: Thermocouple – Principle and types, Radiation sensors: Principle and types. Pressure Transducers: basic principle- different types of manometers-u tube manometer-well type manometers.

Unit III [16 T]

Level transducer-continuous level measurement-discrete level measurement-mass – capacitive level gauges Flow Transducers: Bernoulli’s principle and continuity, Orifice plate, nozzle plate, venture tube, Rotameter, anemometers, electromagnetic flow meter, impeller meter and turbid flow meter

Unit IV [16 T]

Hall effect transducers, Digital transducers, Piezo-electric sensors, eddy current transducers, tacho generators and stroboscope, Magnetostrictive transducers

Radiation sensors: LDR, Photovoltaic cells, photodiodes, photo emissive cell types Force and Torque Transducers: Proving ring, hydraulic and pneumatic load cell, dynamometer and gyroscopes.

Sound Transducers: Sound level meter, Microphone.

Text Books

1. D Patranabis, Sensors and Transducers, PHI, 2nd Edition.
2. E. A. Doebelin, Measurement Systems: Application and Design McGraw Hill, New York
3. A.K. Sawhney,- A course in Electrical & Electronic Measurement and Instrumentation, Dhanpat Rai and Company Private Limited.
4. Murthy D.V.S., —Transducers and Instrumentation, 2nd Edition, Prentice Hall of India Private Limited, New Delhi, 2010.
5. S.Renganathan, —Transducer Engineering, Allied Publishers, 2000



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Database Management System and RDBMS

BCS4B05 Database Management System and RDBMS

Unit I [8 T+ 2L]

Database System concepts and applications Introduction to databases, File Systems vs. DBMS, Advantages and Disadvantages of using DBMS Approach, Database administrators and user, Data Models, Schemas, and Instances, Types of Data Models, Three Schema Architecture and Data Independence, Database Languages and Interfaces.

Unit II [10 T+ 6L]

Entity-Relationship Model - Conceptual Data Models for Database Design Entity Relationship Models, Concept of Entity, Entity Sets, Relationship Sets, Attributes, Domains, Constraints, Keys, Strong and Weak Entities, Concepts of EER. Relational Data Model Relations, Domains and Attributes, Tuples, Keys. Integrity Rules, Relational Algebra and Operations, Relational Calculus and Domain Calculus, Relational Database Design using ER to Relational Mapping.

Unit III [10 T+12L]

Relational Database Design - Relational database design Anomalies in a Database, Normalization Theory, Functional Dependencies, First, Second and Third Normal Forms, Relations with more than one Candidate Key, Good and Bad Decompositions, Boyce Codd Normal Form, Multivalued

Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Unit IV [10 T +20L]

SQL Concepts: Basics of SQL, DDL, DML, DCL, Tables – Create, Modify and Delete table structures, Rename and Drop tables, Defining constraints – Primary key, foreign key, unique, not null, check, IN operator

Select Command, Logical Operators, Functions - aggregate functions, Built-in functions – numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of



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group by, having, order by, join and its types, Exist, Any, All. View - Creation, Renaming the column of a view, destroys view.

Unit V [10 T+24L]

Transaction Management and Concurrency Control - Transaction Properties (ACID), states, Commit, Rollback; Concurrency Control Lost update problems, Locks, two phase locking. Programming with SQL: Data types: Base and Composite, Attributes. Variables – Constants -Using set and select commands, Control Structures: IF, IF THEN ELSE, IF THEN ELSEIF, CASE.

Loops: LOOP, EXIT, CONTINUE, WHILE, FOR, and FOREACH - Looping Through Arrays -

Looping Through Query Results. Security: Locks: Table-level Lock, Row-level Lock, Deadlock,

Advisory Lock. Cursors: Bound and Unbound Cursors, Declaration, Opening, Working with cursors:

FETCH, MOVE, UPDATE/DELETE, CLOSE, Looping through a Cursor. Concept of Stored

Procedures – Advantages and Disadvantages – Creation – Parameters Setting for Function- Alter – Drop – Grant and Revoke - Passing and Returning data to/from Stored Procedures - Using stored

procedures within queries – Triggers: Creation, Modification, Deletion, Error Handling: Control

Structures, Cursors, Functions, Triggers.

Textbooks:

1. Abraham Silberschatz, Henry F Korth, S.Sudharshan, Database System Concepts, 6th Edition

2. W. Gilmore, Beginning PHP and PostgreSQL 8: From Novice to Professional, Goels



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Computer Hut (2007), ISBN: 9788181286000

3. PostgreSQL Official Documentation Online

References:

1. Alex Krigel and Boris M.Trukhnov, SQL Bible, Wiley pubs
2. Paul Nielsen, Microsoft SQL Server 2000 Bible, Wiley Dreamtech India Pubs.
3. CJ Date, Introduction to Database Systems, Addison Wesley.
4. Ramkrishnan, Database Management Systems, McGraw Hill\

Computer Organization and Architecture

BCS5B07 Computer Organization and Architecture

Unit I [12 T]

Digital Logic - Positive and negative logic, logic gates ,NOT gate, OR gate, AND gate, XOR and X-NOR gates, Universal gates- NAND gate, NOR gate,. Combinational circuits- Half adder, half subtractor, full adder, full subtractor, ripple carry adders, look-ahead carry adders, decoders, BCD to 7-segment decoder, encoders, multiplexers and demultiplexers.

Unit II [13 T]

Sequential Logic Circuits: Edge triggering, Pulse triggering ,SR latch, SR flip flop, JK flip flop, Master Slave JK flip flop, D flip flop, T flip flop. Shift register: serial in - serial out, serial in -parallel out, parallel in - serial out, parallel in-parallel out configurations. counters (asynchronous & synchronous), up/down counter, decade counter, mod N counter, Ring counter, Johnson"s counter

Unit III [13 T]

Basic Computer Organization and Design: Instruction Codes , Computer Registers, Computer Instructions, Instruction types, Timing and Control, Instruction Cycle, Memory



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reference Instructions, Register reference instructions, Input, Output and Interrupt Design of Basic Computer, Design of Accumulator logic

Unit IV [13 T]

Micro programmed Control: Control Memory, Address sequencing, Micro program Example, Design of control unit. Processor Organization: general register organization, stack organization, instruction formats, addressing modes, data transfer and manipulation, program control

Unit V [13 T]

Memory Organization: Memory mapping, Associative memory, Cache memory, Virtual Memory, Memory Management Hardware, hit/miss ratio, Input-Output Organization: Peripheral devices, I/O interface, Modes of Transfer-asynchronous and synchronous, Priority Interrupt, Strobe Control, Handshaking. Direct Memory Access, Input-Output Processor, Serial Communication. I/O

Controllers

Textbooks:

1. Thomas L Floyd, Digital Fundamentals, Universal Book Stall (Unit I and II)
2. M. Morris Mano, Computer System Architecture PHI (Unit III – V)

References:

1. Rajaraman V & Radhakrishnan, An Introduction to Digital Computer Design, PHI.
2. William Stallings, Computer Organization and Architecture, PHI.
3. Malvino & Leach, Digital Principles & Applications, TMH
4. Jain R.P. , Modern Digital Electronics, TMH
5. Malvino, Digital Computer Electronics, TMH
6. Bartee T.C., Digital Computer Fundamentals, THM
7. William H. Gothmann, Digital Electronics: An Introduction to Theory and Practice, PHI



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Java Programming

BCS5B08 Java Programming

Unit I [9 T + 5L]

Introduction to OOPS, Characteristics of OOPS, Object oriented languages, comparison between procedural and object oriented programming, basic principles of Object Orientation-class, object, abstraction, encapsulation, inheritance, polymorphism, modularity, and message passing. Features of object orientation - attributes, state, identity, operation, behaviour.

Unit II [9 T + 8L]

Introduction to Java: History, Versioning, The Java Virtual Machine, Byte code, Writing simple java program, Language Components: Primitive Data Types, Comments, Keywords, literals, The break Statement, The continue Statement, Operators – Casts and Conversions, Arrays. Introduction to classes and methods, constructors, Passing Objects to Methods, Method Overloading, Static and final, The this Reference, finalize, inner and nested classes. Inheriting class, extends, member access and inheritance, super keyword, Object class. Dynamic method dispatch, method overriding, abstract class, interface, packages, import statement.

Unit III [10 T + 12 L]

Exceptions, I/O and Threads Input and Output in Java: The File Class, Standard Streams, Keyboard Input, File I/O Using Byte Streams, Character Streams, File I/O Using Character Streams -Buffered Streams, File I/O Using a Buffered Stream, Keyboard Input Using a Buffered Stream, Writing Text Files. Threads: Threads vs. Processes, Creating Threads by Extending Thread, Creating Threads by Implementing Runnable, Advantages of Using Threads, Daemon Threads,

Thread States, Thread Problems, Synchronization. Exceptions: Exception Handling, The Exception Hierarchy, throws statement, throw statement, Developing user defined Exception Classes- The



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finally Block.

Unit IV [10 T + 12 L]

Database Connectivity & Applets: Introduction to JDBC : The JDBC Connectivity Model, Database Programming, Connecting to the Database, Creating a SQL Query, Executing SQL Queries, Getting the Results, Updating Database Data, Executing SQL Update/Delete, The Statement Interface, The ResultSet Interface, ResultSetMetaData. Introduction to GUI Applications - Applets - Types of Applet, Applet Skeleton, Update method, repaint Methods, Html Applet tag and passing parameter to applet.

Unit V [10 T + 11 L]

Events and GUI Applications: Event Handling: The Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter Classes. Java Desktop Applications, Introduction to the AWT, Overview of the AWT, Structure of the AWT, The AWT hierarchy, Containers, Components, Canvas, Frame Working with: Color, Font, FontMetrics, Simple Graphics- Point, line, Rectangle, Polygon, Controls - Button, , Checkbox, Choice, , Label, List, Scroll bar, TextArea, TextField, Layout Manager, MenuBar, Menu, MenuItem , Checkbox MenuItem.

Text Books

1. Herbert Scheldt, Java The Complete Reference, 8th Edition, Tata McGraw-Hill Edition, ISBN: 9781259002465

References

1. E Balaguruswamy, Programming in Java: A Primer, 4th Edition, Tata McGraw Hill Education Private Limited, ISBN: 007014169X.
2. Kathy Sierra, Head First Java, 2nd Edition, Shroff Publishers and Distributors Pvt Ltd, ISBN: 8173666024.
3. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, Java Enterprise in a



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Nutshell: A Desktop Quick Reference, 3rd Edition, O'Reilly Media, ISBN: 0596101422.

Web Programming using PHP

BCS5B09 Web Programming using PHP

Unit I [9 T + 9L]

Introduction web-documents: Static, Dynamic, Active - Web programming: client side and server side scripting. HTML 5: Document Structure, Elements, Attributes, Types of Elements and Attributes, Basic HTML Data types. Using HTML5 form elements: datalist, keygen, output, progress, meter. File uploading using forms - Frameset and frames. CSS: External CSS, CSS3 Syntax, Selector: Universal, Class, ID. Working with Lists and Tables, CSS ID and Class – Navigation Bar - Image Gallery – Image Opacity.

Unit II [9 T + 9L]

Javascript: Introduction, Client side programming, script tag, comments, variables. Including

JavaScript in HTML: head, body, external. Data types. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements, Loops, break and continue. Output functions: write, writeln, popup boxes: prompt, alert, confirm. Functions: Built-in Global Functions: alert(), prompt(), confirm(), isNaN(), Number(), parseInt(). User Defined Functions, Calling Functions with Timer, Events Familiarization: onLoad, onClick, onBlur, onSubmit, onChange, Document Object Model (Concept). Objects: String, Array, Date.

Unit III [10 T + 10 L]

PHP: Introduction, Server side programming, Role of Web Server software, Including PHP Script in HTML: head, body, external. Comments, Data types, variables and scope, echo and print. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements, Loops, break and continue. User Defined Functions.



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Unit IV [10 T + 10 L]

Working with PHP: Passing information between pages, HTTP GET and POST method, Cookie, Session. String functions: strlen, strpos, strstr, strcmp, substr, str_replace, string case, Array constructs: array(),list() and foreach(). Header().

Unit V [10 T + 10 L]

PHP & PostgreSQL: Features of PostgreSQL, data types, PostgreSQL commands – CREATE DATABASE, CREATE TABLE, DESCRIBE TABLE (\d table_name or using usinginformation_schema), SELECT, SELECT INTO, CREATE AS, DELETE, UPDATE,

INSERT. PHP - PostgreSQL Integration: Establishing Database Connection (pg_connect(), pg_connection_status(), pg_dbname()), Getting Error String (pg_last_error()), Closing database Connection (pg_close()), Executing SQL statements (pg_query(), pg_execute()), Retrieving Data (pg_fetch_row(),pg_fetch_array(), pg_fetch_all(), pg_fetch_assoc(), pg_fetch_object(), pg_num_rows(), pg_num_fields(), pg_affected_rows(), pg_num_rows(), pg_free_result()), Insertion and Deletion of data using PHP, Displaying data from PostgreSQL database in webpage. Introduction to AJAX - Implementation of AJAX in PHP - Simple example for partial page update.

Textbook

1. HTML 5 Blackbook, Dreamtech Press, ISBN 9879351199076, 2016 Edition.
2. W. Gilmore, Beginning PHP and PostgreSQL 8: From Novice to Professional , Goels Computer Hut (2007), ISBN: 9788181286000

Reference

1. HTML 5 Blackbook, Dreamtech Press, ISBN 987-93-5119-907-6, 2016 Edition.
2. Jon Duckett, Beginning Web Programming with HTML,XHTML, CSS, Wrox.
3. Jim Converse & Joyce Park, PHP & MySQL Bible, Wiley.
4. PostgreSQL Official Documentation Online



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Principles of Software Engineering

BCS5B10 Principles of Software Engineering

UNIT I [13T]

Software and Software Engineering: Overview of Software Engineering, Practice & Myths; Software Process; Generic process model- Framework Activity, Task Set, Process Patterns, Process Improvement; SDLC , Prescriptive

process model- Waterfall Model, Spiral Model, Incremental Process Model, Evolutionary Process Model; Specialized Process Models: Component Based

Development, the Formal Methods Models;

Agile development-Agile Process; Extreme Programming; Other Agile Process Models – ASD,

Scrum, DSDM, FDD, LSD, Agile Modeling, Agile Unified Process..

UNIT II [13T]

Requirements Engineering- Establishing the Groundwork- Eliciting Requirements - Developing use cases - Building the requirements model - Negotiating, validating Requirements - Requirements

Analysis-Requirements Modeling Strategies.

UNIT III [14T]

MODELING WITH UML: Concepts and Diagrams - Use Case Diagrams - Class Diagrams -Interaction Diagrams - State chart Diagrams – Activity Diagrams - Package Diagrams - Component Diagrams - Deployment Diagrams -Diagram Organization- Diagram Extensions. Design ProcessDesign concepts: Abstraction, Architecture, patterns, Separation of Concerns, Modularity, Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object Oriented Design Concepts, Design Classes- Design Model: Data, Architectural, Interface, Component,

Deployment Level Design Elements.



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UNIT IV [11T]

Structured coding Techniques-Coding Styles - Standards and Guidelines-Documentation Guidelines-Modern Programming Language Features: Type checking-User defined data types-Data Abstraction Exception Handling - Concurrency Mechanism.

UNIT V [13T]

TESTING: Software Quality- Software Quality Dilemma- Achieving Software Quality- Testing: Strategic Approach to software Testing- Strategic Issues - Testing: Strategies for Conventional Software, Object oriented software, Web Apps-Validating Testing- System Testing- Art of Debugging.

MAINTENANCE: Software Maintenance-Software Supportability- Reengineering - Business Process Reengineering- Software Reengineering- Reverse Engineering - Restructuring- Forward

Engineering- Economics of Reengineering

Text Books

1. Roger S, “Software Engineering – A Practitioner’s Approach”, seventh edition, Pressman, 2010.
2. Pearson Education, “Software Engineering by Ian Sommerville”, 9th edition, 2010.
3. Roff: UML: A Beginner’s Guide TMH

References

1. Hans Van Vliet, “Software Engineering: Principles and Practices”, 2008.
2. Richard Fairley, “Software Engineering Concepts”, 2008.
3. RohitKhurana, Software Engineering: Principles and Practices, 2nd Edition, Vikas Publishing House Pvt Ltd.
4. PankajJalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa



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Publishing House.

5. Alhir, learning UML, SPD/O“Reil

Open Courses (XXX5DXX)

Introduction to Computers and Office Automation

BCS5D01 Introduction to Computers and Office Automation

Unit I [12T]

Introduction to Computers: Types of Computers - DeskTop, Laptop, Notebook and Netbook. Hardware: CPU, Input / Output Devices, Storage Devices – System - Software - Operating Systems, Programming Languages, Application Software - Networks - LAN, WAN - Client -

Server.

Unit II [12T]

Documentation Using a Word Processor (OpenOffice Writer / M.S. Word) - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features - Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object,

Template.

Unit III [12T]

Electronic Spread Sheet (Open Office Calc/MS-Excel) - Introduction to Spread Sheet, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and



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Functions, Charts, Advanced features – Pivot table & Pivot Chart, Linking and Consolidation.

Unit IV [12T]

Presentation using (OpenOffice Impress/MS-Power Point): Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect

or In-Built Sound Effect.

References:

1. Michael Miller, Absolute Beginner’s Guide to Computer Basics, Prentice Hall.
2. Russell A. Stultz, Learn Microsoft Office, BPB Publication.
3. H.M.Deitel, P. J. Deitel, et al., Internet & World Wide Web - How to program, Prentice Hall

Web Designing

BCS5D02 Web Designing

Unit I [12T]

HTML: Introduction - history of html, sgml - structure of html document, web page layout, html tags and types - font type, paragraph formatting, meta data, blockquote, hyperlinks, linking, comments, white space, horizontal ruler, images, ordered and unordered lists, frames, tables, forms

Unit II [12T]



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DHTML: Introduction, DHTML technologies, elements of DHTML, document object model, events - window events, form events, keyboard events, mouse events, style sheets, properties used in style sheets - background properties, positioning properties.

Unit III [12T]

Javascript: Introduction and advantages of javascript, java script syntax, writing javascript in html, javascript operators, arrays and expressions, programming constructs - for .. in loop, while loop -dialog boxes and prompts - alert, prompt, confirm methods - functions - built-in functions and userdefined functions,

scope of variables, handling events, using event handlers and event methods, form object, properties, methods, form element's properties and methods.

Unit IV [12T]

HTML Editor: Introduction, advantages, creating, opening, saving a web page, building forms, formatting and aligning text and paragraph, adding lists, styles and themes, linking pages, working with images, frames.

Reference:

1. H. M. Dietel, Internet and World Wide Web, Pearson

Introduction to Problem Solving and C Programming

BCS5D03 Introduction to Problem Solving and C Programming

Unit I [12T]

Introduction: The problem solving aspect, Top-down design, Implementation of algorithms, Program verification, efficiency of algorithms. Introduction to C Programming, overview and importance of C, C Program Structure and Simple programs, Creation and Compilation of C Programs under Linux and Windows Platforms.



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Unit II [12T]

Elements of C Language and Program constructs, Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable declaration

and assignment of values, Symbolic constant definition. C-Operators, Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations.

Unit III [12T]

Decision making, Branching and Looping, Decision making with IF statement, Simple IF statement, If.. else statement, Nesting of If..else and else...if Ladder, Switch statement, Conditional operator, Go-to statement. Looping: While loop, Do-While, and For Loops, Nesting of loops, jumps

in loop, skipping of loops.

Unit IV [12T]

Array & Strings - One dimensional array, two dimensional array and multidimensional array, strings and string manipulation functions. Structures & Union structure definition , giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, CSC-fields.

References:

1. Balaguruswami, Programming in ANSI C
2. Brian W. Kernighan & Dennis M. Ritchie, The C Programming Language
3. Yashvant P. Kanetkar, Let Us C
4. ByranGotfried, Programming with C, Schaums Outline Seri



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Introduction to Data Analysis using Spread sheet

BCS5D04 Introduction to Data Analysis using Spread sheet

Unit I [12T]

Introduction to MS Excel and Understanding Basic Working with it: Quick review on MS Excel Options, Ribbon, Sheets , Difference between Excel 2003, 2007, 2010 and 2013- Saving Excel File as PDF, CSV and Older versions - **Using Excel Shortcuts - Copy, Cut, Paste, Hide, Unhide, and Link the Data in Rows, Columns and Sheet Using Paste Special Options - Formatting Cells, Rows, Columns and Sheets - Protecting & Unprotecting Cells, Rows, Columns and Sheets with or without Password - Page Layout and Printer Properties - Inserting Pictures and other objects in Worksheets**

Unit II [12T]

Introduction to Pivot table: **Use multiple pivot tables and pivot charts to create dashboard, Connect** multiple slicers to the pivot tables.

Unit III [12T]

Pivot table applications in analytics: filter the data shown in the pivot in different ways to achieve subsets of the data, **Use calculated fields on top of the pivot table to calculate profitability and find anomalies.**

Unit IV [12T]

Formulae and Function: Use formulas to aggregate the data as an alternative to pivot tables for more flexible reporting layouts. Usage of multiple tables in a single pivot, introduction to data table.

Text Books:

1. Winston, Microsoft Excel 2013: Data Analysis and Business Modeling, Prentice Hall India

Learning Private Limited (2013), ISBN: 9788120349605

References:



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1. John Walkenbach, Microsoft Excel 2013 Bible, Wiley (23 April 2013), ISBN: 9788126541720.
2. Paul McFedries, Excel 2013 Formulas and Function 1st Edition, Pearson India (2014), ISBN: ISBN: 9789332524026.

Android Programming

BCS6B11 Android Programming

Unit I [13T+3L]

Introducing the android computing platform, History of android, an- droid softwarestack, Developing end user application using Android SDK, Android java packages,Setting up the development environment, Installing android development tools(ADT), Fundamental components,

Android virtual devices, Running on realdevice, Structure of android application, Application life cycle.

Unit II [13T+3L]

Understanding android resources - String resources, Layout resources, Resourcereference syntax, Defining own resource IDs - Enumerating key android resources,string arrays, plurals, Colour resources, dimension resources, image resources,Understanding content providers - Android built in providers, exploring databaseson emulator, architecture of content providers, structure of android content URIs,reading data using URIs, using android cursor, working with where clause,inserting updates and deletes, implementing content, Understanding intents basicsof intents, available intents, exploring intent composition, Rules for ResolvingIntents to Their Components, ACTION PICK,



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GET CONTENT, pending intents

Unit III [13T+3L]

User interfaces development in android - building UI completely in code, UI usingXML, UI in XML with code, Android's common controls - Text controls, buttoncontrols, checkbox control, radio button controls, image view, date and timecontrols, map view control, understanding adapters, adapter views, list view, gridview, spinner control, gallery control, styles and themes, Understanding layoutmanagers - linear layout manager, table layout manager, relative layout manager,frame layout manager, grid layout manager.

Unit IV [13T+3L]

Android menus - creating menus, working with menu groups, responding to menu items, icon menu, sub menu, context menu, dynamic menus, loading menu through XML, popup menus, Fragments in Android structure of fragment, fragment life cycle, fragment transaction and back stack, fragment

manager, saving fragment state, persistence of fragments, communications with

fragments, startActivity() and setTargetFragment(), using dialogs in android, dialog fragments,

working with toast, Implementing action bar - tabbed navigation action bar activity, implementing base activity classes, tabbed action bar and tabbed listener, debug text view layout, action bar and

menu interaction, list navigation action bar activity, spinner adapter, list listener, list action bar, standard navigation action bar activity, action bar and search view, action bar and fragments.

Unit V [12T+4L]

Persisting data - Files, saving state and preferences - saving application data, creating, saving and retrieving shared preferences, preference framework

And preference activity, preference layout in XML, native preference controls, preference fragments, preference activity, persisting the application state, including static files as



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resources, Working with file system, SQLite - SQLite types, database manipulation using SQLite, SQL and database centric data model for Android, Android database classes.

References:

1. Satya Komatineni & Dave MacLean, Pro Android 4, Apress.
2. Retomeier, Professional Android 4 Application Development, Wrox.
3. Zigurd Mednieks, Laird Dornin, G. Blake Meike, and Masumi Nakamura, Programming

Android, O'Reill

Operating Systems

BCS6B12 Operating Systems

Unit I [12T + 4P]

Operating System - Objectives and functions - The Evolution of Operating Systems: Serial Processing, Simple batch Systems, Multi Programmed batch Systems, Time Sharing Systems, Parallel Systems, Distributed Systems, Real

time systems. Definition of Process, Process States, Process Control Block, Operations on Process, Process Communication, Communication in Client server System, Basic concepts of threads, Concurrency, Principles of Concurrency, Mutual exclusion, Semaphores, Messages, Dead lock: Prevention, Detection, Avoidance.

Unit II [13 T + 3P]

Linux Shell Programming: Introduction – Shells available in Unix: Bourne shell (sh), C shell (csh), TC shell (tsh), Korn shell (ksh), Bourne Again Shell (bash). Bash: special characters – getting help – man pages – Linux Directory Layout – Command for Navigating the Linux Filesystems: pwd, cd, ls, file, cat, cp, mv, mkdir, rmdir, whereis – Piping and Redirection - Informational Commands: ps, w, id, free – clear, echo, more. File permissions – Setting Permissions – Making a file executable. Creating shell programs:



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comments, variables, operators (arithmetic, relational, logical) – single and double quotes - read – echo – test - conditional commands, iterative commands – break – continue - evaluating expressions using expr, bc – strings – grep – arrays.

Unit III [13T + 3P]

CPU Scheduling: Scheduling Criteria, Scheduling algorithms: FCFS, SJF, Priority, RR, Multilevel, Feedback Queue - Process synchronization, The Critical Section Problem, Synchronization Hardware, Classical Problems of Synchronization: Reader Writer, Dining Philosopher. File and Database System, File System, Functions of organization, Allocation and Free Space Management.

Unit IV [13T + 3P]

Memory Management, Address Binding, Logical Vs Physical Address Space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand Paging, Page Replacement, Thrashing.

Unit V [13 T + 3 P]

Protection and security: policy and mechanism, authentication, authorization. Mobile OS: Concepts, history, features, architecture, future scope. Case studies: Android, UNIX kernel and Microsoft

Windows NT (concepts only).

Text Books

1. Silberschatz, Galvin and Gagne, Operating System Concepts, John Willey & Sons
2. William Stallings, Operating Systems, Internals and Design Principles, PHI
3. Mendel Cooper, Advanced Bash-Scripting Guide, Available at <http://www.tldp.org/LDP/abs/abs-guide.pdf>

References:

4. Nutt G.J, Operating Systems: A Modern Perspective, Addison Wesle



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Computer Networks

BCS6B13 Computer Networks

Unit I [16 T]

Introduction to Computer networks, Topology, categories of networks, Internetwork, Internet,

Network Models, Layered model, OSI and TCP/IP models, Physical layer, Switching - Circuit switching, Packet Switching and Message Switching, DTE - DCE Interface, EIA - 232 interface,

X.21 modems.

Unit II [16T]

Data link layer, Error detection and correction, Types of errors, Single CSC error and Burst error, Vertical redundancy check (VRC), longitudinal redundancy Check (LRC), Cyclic Redundancy Check(CRC), Error correction - Single CSC error correction, Hamming code Data compression -

Huffman code, data link control, Line discipline, Flow control, Error control, Multiple Access,

Random Access, ALOHA, pure ALOHA and slotted ALOHA, CSMA/CD and SCMA/CA, Polling, Wired LANs, Ethernet - IEEE standards, Wireless LANs.

Unit III [16T]

Network layer, Networking and Internetworking devices - Repeaters, Bridges, Routers, Gateways, Logical addressing - IPv4 & IPv6 addresses, Network Address Translation(NAT), Internet protocols, internetworking, Datagram, Transition from IPv4 to IPv6, Address Mapping-Error reporting and multicasting - Delivery, Forwarding and Routing algorithms, Distance Vector Routing, Link State Routing.

Unit IV [16 T]



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Transport layer, Process-to-process Delivery: UDP, TCP and SCTP, Congestion control
anQuality of Service, Application Layer, Domain Name Systems-Remote Login-Email
FTP, WWW,

HTTP, Introductory concepts on Network management: SNMP.

Unit V [16T]

Cryptography and Network Security: Introduction – Goals of Security – Attacks - Services
and Techniques. Basics of Cryptography: Plain Text - Cipher Text – Encryption –
Decryption. Confidentiality: Basics of Symmetric Key Ciphers - Traditional Symmetric
Key Ciphers: Substitution, Transposition, Stream & Lock, Modern – Components of
Modern Block Cipher –DES - Modern Stream Cipher. Basics of Asymmetric Key Ciphers
– RSA Cryptosystem.

Integrity: Message – Message Digest – Hash Function. Authentication: MAC. Digital
Signature : Analogy with Manual Signature – Process – Signing the Digest – Services –
RSA Digital Signature Scheme.

Textbook:

1. Behrouz A Forozan, Introduction to Data Communications & Networking, TMH

References:

1. Andrew S. Tanenbaum, Computer Networks, PHI
2. William Stallings, Data and Computer Communications, VIIth Edition, Pearson Education
3. William Stallings, Cryptography and Network Security, Principles and Practices, Prentice

Hall of India.

4. Steven Graham and Steve Shah, Linux Administration: A Beginners Guide, Third Edition,

Dreamtech,2003



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Industrial Visit and Project Work

BCS6B17 Industrial Visit and Project Work

The objective of the B.Sc. Computer Science final project work is to develop a quality software solution by following the software engineering principles and practices. During the development of the project the students should involve in all the stages of the software development life cycle (SDLC). The main objective of this project course is to provide learners a platform to demonstrate

their practical and theoretical skills gained during five semesters of study in B.Sc. Computer Science Programme.

During project development students are expected to define a project problem, do requirements

analysis, systems design, software development, apply testing strategies and do documentation with

an overall emphasis on the development of a robust, efficient and reliable software systems. The

project development process has to be consistent and should follow standard. For example database

tables designed in the system should match with the E-R Diagram. SRS documents to be created as per IEEE standards. Students are encouraged to work on a project preferably on a live software project sponsored by industry or any research organization. Topics selected should be complex and large enough to

justify as a B.Sc. Computer Science final semester project. The courses studied by the students during the B.Sc. Computer Science Programme provide them the comprehensive background knowledge on diverse subject areas in computer science such as computer programming, data structure, DBMS, Computer Organization, Software Engineering, Computer Networks, etc., which will be helping students in doing project work. Students



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can also undertake group project to learn how to work in groups. However, the maximum number of students in a group must be limited to 4.

For internal evaluation, the progress of the student shall be systematically assessed through two or three stages of evaluation at periodic intervals.

A bonafied project report shall be submitted in hard bound complete in all aspects.

Industrial Visit:

Contact Hours per Week: NIL

Number of Credits: 1

Number of Contact Hours: NIL

Course Evaluation: External – 10 Marks

Guide Lines:

- **Minimum one day visit to National research Institutes, Laboratories, places of scientific Importance or Software Companies.**

OR

- **One week Industrial Training / internship at any software firms/ Research Labs**
- The Industrial visit should be done in fifth or sixth semester.
- A 10 – 20 page Industrial visit / Training report have to be submitted with certificate from industry / institute, sufficient photos and analysis along with Project for evaluation in the sixth semester.



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Machine Learning

BCS6B16b | Machine Learning

Unit I [12 T]

Basics of Linear Algebra for ML : Classes of spaces (vector , metric , normed , inner product),

Pythagorean Theorem, Type of matrices, Matrix operations, Eigenvector, Fundamental Theorem of

Linear Algebra.

Unit II [13 T]

Foundations of Probability for ML : Probability Theory (Random Variables, Distributions, Mean

and Variance, Bayes Rule), Basic Techniques (Naive Bayes, Nearest Neighbor Estimators, KMeans), Density Estimation (Limit Theorems, Parzen Windows, Exponential Families, Estimation,

Sampling).

Unit III [13 T]

Introduction to Machine Learning : Applications, Issues in Machine Learning, **Designing a Learning system - Supervised Learning - Unsupervised Learning, Vapnik-Chervonenkis Dimension – Probably Approximately Correct (PAC) Learning- Learning Multiple Classes, Bayesian Decision theory- Classification, Discriminant Functions, Association rules.**

Unit IV [13 T]

Dimensionality Reduction : Subset Selection-Principal Component Analysis-Linear Discriminant



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Analysis, Clustering- K-means Clustering- Expectation maximization Algorithm- Hierarchical

Clustering,

Unit V [13 T]

Parametric and Non-Parametric methods for classification and regression : Parametric methods-Maximum Likelihood Estimation- Baye"s Estimator-Parametric Classification, Regression

,Non-Parametric methods- Kernel Estimator- K-nearest neighbour estimator, Decision TreesUnivariate Trees-Classification trees, Regression trees, Rules extraction from Trees

References

1. Ethem Alpaydın, Introduction to Machine Learning, Second edition, MIT Press, 2010.
2. Alex Smola and S.V.N. Vishwanathan ,Introduction to Machine Learning, Second Edition, Cambridge University Press
3. Jason Brownlee, Basics of Linear Algebra for Machine Learning, First Edition, Machine Learning Mastery, 2018
4. Bishop. C M, Pattern Recognition and Machine Learning. Springer, 2006.
5. Duda, R O, Hart P E and Stork D G. Pattern Classification. Wiley-Interscience, 2nd Edition, 2000.
6. Hastie T, Tibshirani R and Friedman J, The Elements of Statistical Learning: Data Mining, Inference and Prediction. Springer, 2nd Edition, 2009.



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7. Mitchell T, Machine Learning. McGraw Hill, 1997.

8. Mohssen Mohammed, Muhammad Badruddin Khan ,Eihab Bashier Mohammed Bashier,

Machine Learning Algorithms and applications, CRC Press, First Edition,2017

Online References

MIT Open Courseware, Stanford Machine Learning Courses, IISc Machine Learning, IIT Kharaghpur, Bombay and Delhi ML Courses,

Computer Graphics

BCS6B16d Computer Graphics

Unit I [13 T]

Introduction to Computer Graphics Definition, Application, Pixel, Frame Buer, Raster and Random

Scan display, Display devices CRT, Color CRT Monitors, basics of LCD & LED Monitors.

Unit II [12 T]

Scan Conversion of line DDA algorithm of line drawing, Scan conversion of circles Bresenham's

circle generating algorithm, Polygon FillingScan line polygon filling algorithm.

Unit III [13 T]

Two Dimensional transformation, Translation, Rotation, Scaling, Homogeneous Coordinates,



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Reflection, Shear.

Unit IV [13 T]

Window to view port transformation, clipping, line clipping, Cohen Sutherland line clipping,

Polygon clipping, Sutherland and Gary Hodgman polygon clipping algorithm.

Module V [13 T]

Color Models & Color Applications Light and Color, Different color models, RGB, CMY, YIQ.

Introduction to GIMP Image Manipulation using GIMP.

Textbook:

1. Donald Hearn and M. Pauline Baker, Computer Graphics, PHI, New Delhi.

References:

. Zhigang Xiang and Roy Plasock , Computer Graphics, Schaum's Outlines.

1. Deborah Morley, Understanding Computers Today and Tomorrow, Introductory Edition



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Technical Writing

BCS6B16e Technical Writing

Unit I [13 T]

Basics of Technical Communication: Technical Communication - features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; the flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Barriers to Communication.

Unit II [13 T]

Constituents of Technical Written Communication: Word formation, Prefix and Suffix; Synonyms and Antonyms; Homophones; One Word Substitution; Technical Terms; Paragraph Development: Techniques and Methods -Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of

Condensation- various steps.

Unit III [12 T]

Forms of Technical Communication - Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order, Claim and Adjustment Letters; Memos, Notices, Circulars; Job application and Resumes.

Unit IV [13 T]

Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance, Technical Paper, Project, Dissertation and Thesis Writing. E-Media: E-mail – E-Newsletter – Blogging – E-Magazines – Social Networks.

Unit V [13 T]

Soft Skills: Presentation Strategies - Preparing a Presentation – Body Language – Voice Dynamics – Handling Questions.



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KEY INDICATOR	1.3	Curriculum Enrichment
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Text Books

1. Professional Communication: For GautamBuddh Technical University & Mahamaya

Technical University, Pearson Education India.

2. Phillip A. Laplante, Technical Writing: A Practical Guide for Engineers and Scientists

(What Every Engineer Should Know), CRC Press.

References

1. Gerald J. Alred ,Charles T. Brusaw, Walter E. Oliu, Handbook of Technical Writing, Tenth

Edition.

2. Gary Blake and Robert W. Bly, The Elements of Technical Writing, New York: Macmillan

Publishers.

1. Hackos, JoAnn T., Managing Your Documentation Projects. Wiley, 1994

Fundamentals of Life Skill Education

BCS6B16f Fundamentals of Life Skill Education

Unit I [13 T]

Introduction to life skill education, definition, components, pillars of learning, need for life skill training, approaches - critical thinking skills/decision making skills, interpersonal/communication skills, criteria for using life skills.



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Unit II [13 T]

Communication skills, communication, definition , components- sender, message, channel , receiver, feedback, types of communication, effective interpersonal communication, barriers,

communication noise, listening, ways to improve interpersonal communication, effective public speaking interview, group discussion

Unit III [13 T]

Career planning, career planning steps, choosing a career, career development, career guidance and

career guidance centre, need and importance of career guidance, career guidance centre and

sources, making a career decision, preparing a resume and tips

Unit IV [12 T]

Self management, self esteem, definitions, practice self acceptance, practice self acceptance

characteristics of people with high self-esteem, low self esteem, characteristics and causes, self-esteem building, self awareness importance, develop self awareness, self control, developing self

control, emotional intelligence or emotional quotient, emotional quotient , two aspects of emotional

intelligence, five domains of emotional eq or ei, social intelligence, coping with emotions,

emotional intelligence,

Unit V [13 T]

Stress and strain: concept of stress, meaning and definition of stress, types of stress, major symptoms of stress, manage everyday stress. strain-mental strain, causes of strain, conflict, conflict

resolution, understanding conflict in relationships, emotional awareness, managing and resolving conflict, stages of healthy conflict resolution, styles of conflict resolution, styles of dealing with



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conflict, developing positive thinking, positive and negative self-talk, better self-talk, impacts , assertiveness, behaviour , importance of assertive behaviour.

Text Books

1. ShaliniVerma, Development of Life Skills and Professional Practice , Vikas Publishing House; First edition (2014)

References:

1. Dr. K. RavikanthRao and Dr. P. Dinakar, Life Skills Education, Neelkamal; First edition (2016)

COMPUTER SCIENCE - COMPLEMENTARY

Computer Fundamentals

CSC1C01 Computer Fundamentals

UNIT I [7T+6L]

Number systems- Non-positional number systems and positional number systems (Binary, Octal and Hexadecimal), Converting from one number system to another- decimal to a new base, converting to decimal from another bases, converting from base other than ten to base other than ten, short cut method for converting from binary to octal, octal to binary, binary to hexadecimal and



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hexadecimal to binary, Computer Codes (BCD, EBCDIC, ASCII) error detecting and correcting codes, parity bit, Hamming Code, computer arithmetic, importance of binary, binary addition and subtraction.

UNIT II [6T+7L]

Boolean Algebra and Logic circuits- fundamental concepts of Boolean Algebra, postulates, Principle of duality, theorems of Boolean Algebra, Boolean functions, minimization, complement, canonicals forms, conversion between canonical forms. Logic Gates- AND, OR, NOT, NAND, NOR, XOR and XNOR, logic circuits, converting expression to logic circuit, universal NAND and NOR gates, Exclusive OR and equivalence functions, Design of Combinational circuits (Half Adder, Subtractor and Full Adder)

UNIT III [6T+7L]

Basic Computer Organization-Input Unit, Output Unit, Storage Unit (Direct, Sequential and Random Access), CPU organization, Control Unit (micro programmed and hardwired control), primary storage, memory hierarchy, storage locations and addresses, storage capacity, bit, byte, nibble, RAM, ROM, PROM and EPROM, cache memory, registers. Secondary storage devices (Magnetic tape, Hard disk and CD drive)

UNIT IV [7T+6L]

I/O devices - Input Devices-identification and its use, keyboard, pointing devices (mouse, touch pad and track ball), Video digitizer, remote control, joystick, magnetic stripes, scanner, digital camera,



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microphone, sensor, and MIDI instruments, Output Devices identification and its use, monitor, printer (laser, inkjet, dot-matrix), plotter, speaker, control devices (lights, buzzers, robotic arms, and motors)

UNIT V [6T+6L]

Planning a Computer program, purpose of program planning, algorithm, flowchart - symbols, sample flowcharts, advantages and limitations.

Text Books:

1. Pradeep K. Sinha and Priti Sinha, Computer Fundamentals, BPB

References:

1. Peter Nortorn, Introduction to Computer, TMH

2. Rajaraman, V, Fundamental of Computers, Prentice Hall India

3. B. Ram, Computer Fundamentals



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Fundamentals of System Software, Networks and DBMS

CSC2C02 Fundamentals of System Software, Networks and DBMS

UNIT I [6 T+6L]

System software - classification of programming languages (Machine, assembly & High level),
 Characteristics and Comparison, language processors (Assembler, Interpreter and Compiler),
 Operating Systems- Functions, types of OS (batch, multiprogramming, time sharing, real time and distributed)

UNIT II [7 T+6L]

Computer networks- goals of networking, network topologies, types of networks (LAN, MAN and WAN), network model, OSI model- 7 layers, Internet Layer- 5 layers, Communication Media Guided (Twisted Pair, Coaxial Cable and Fiber Optic) and Unguided (microwave, satellite).

BSc. Computer Science (Academic Year 2019-20 Onwards)

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UNIT III [6 T+7L]

Database Management Systems-definition, structure of Database, data models (Record based Data model, Network model: - Basic Components, Record types, data types, links, relationships, Hierarchical model and Relational model)

UNIT IV [6 T+7L]

Structured query language - Create, insert, select, update, delete, alter, drop commands

UNIT V [7 T+6L]



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HTML-hypertext, hyper media, understanding basic HTML tools- HTML editor, web browser,
 General structure of HTML document, different types of elements-doc type, comment element,
 structural element, HTML tags and attributes: <html>, <body>, <head>, <title>, <h1>,... ,<h6>,
, <table>, , <hr>, adding links, background image to the body,
 creating lists.

References:

1. P. K Sinha, Fundamentals of Computers
2. D. M Dhamdhare, Operating System: A concept based Approach
3. Behrouz A Forouzan, Data Communication & Networking, MC Graw Hill
4. Joel Sklar, Principles of Web Page Design, Vikas Publication

Problem Solving Using C

CSC3C03 Problem Solving Using C

UNIT I [9 T+7L]

Introduction to C- Structure of C program, Character Set, Keywords, Identifiers, Data Types,
 Qualifiers, Variables, Declarations, Symbolic Constants, Expressions, Statements, Different Types
 of Operators (Arithmetic, Logical, Relational & Equality, Unary and Conditional), Operator
 Precedence and Associativity, Library Functions, Comments, I/O functions-(Formatted scanf()
 &printf(), getchar (), putchar (), getche(), gets(), puts())



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UNIT II [9 T+7L]

Control Statements- Selection Statements (if, if-else, else if ladder, switch), iteration (while, do while, for), jumping (goto, break, continue), Nested Control Statements

UNIT III [10 T+6L]

Structured Data types - Arrays (One dimensional and Two Dimensional), Character and String

Functions, Structure (Definition, Processing-period Operator), Union

UNIT IV [10 T+6L]

User defined Functions - Advantages, Definition, Accessing functions, formal and Actual

Parameters, Recursion, Storage Classes- Automatic, External, Static and Register Variable,

Argument Passing Mechanism

UNIT V [11T+6L]

Pointers and data files- Pointers, advantages, declaration, operations on pointers, pointers and one dimensional arrays, dynamic memory allocation. Data files (sequential), file handling functions

(fopen(), fclose(), fputc(), fgetc(), fgets(), fputs(), fscanf(), fprintf())

Text Book:

1. E Balagurusamy, Programming in Ansi C, Tata McGraw Hill

References:

1. Byran Gotfried, Programming with C, Schaum Series

2. Kezningham & Ritchie, Programming in C

3. Yashvant Kanetkar, Let us C, BPB publications

4. Mullish Cooper, The spirit of C, Jasco books

5. Herbert Schildt, The Complete reference C, Tata McGraw Hil



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Data Structure Using C

CSC4C04 Data Structure Using C

Unit I [11 T+6L]

Primitive Data types and Abstract Data Types(ADT) - Introduction to data structures – definition -characteristics of data structures - **categories of data structures – algorithm - space complexity and time complexity of an algorithm** (concept only).

Unit II [7 T+6L]

Arrays and Singly Linked Lists - 1D, 2D and Multi-dimensional arrays – operations on arrays -Sparse matrix Representation

Unit III [9 T+7L]

Lists- **Linked List- Definition –Creation- Operations, Basics of Doubly Linked List, Circular** Linked List.

Unit IV [11 T+7L]

Stack and Queues – Definition and Operations on stack - Implementation of Stack using arrays and linked lists - Applications of Stacks - Polynomial AdditionQueues – Definition, Implementations of queue using arrays and linked lists – basics of Circular queue, Dequeue - Applications of queues.

Unit V [10 T+7L]

Searching and Sorting: Searching: Linear search & Binary search.

Sorting – Linear sort - Bubble sort - Selection sort - Insertion sort - Quick sort - Merge sort

Comparisons and implementations.

Text Books:

1.SeymourLipschutz,“DataStructures”,TataMcGrawHillPublishingCompanyLimited,Schaum’sOutlines,NewDelhi.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2. YedidyanLangsam, MosheJ. Augenstein, and AaronM. Tenenbaum,

“DataStructuresUsingC”, PearsonEducation., NewDelhi.

3. HorowitzandSahani,

“FundamentalsofdataStructures”, GalgotiaPublicationPvt.Ltd., NewDelhi.

Reference Books:

1. Trembley, J.P. And Sorenson P.G., “An Introduction to Data Structures With Applications”,

Mcgraw- Hill International Student Edition, New York.

2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Addison- Wesley, (An Imprint of Pearson Education), Mexico City.

International Business

MCM2C09 International Business

Module I

Meaning and Scope–Theories of International trade: classical and modern theories – protectionism vs. free trade – Trade barriers - Tariff and Non-tariff barriers – Terms of trade – Balance of payment – Components of BOP: Current account, Capital account and Official reserve account-disequilibrium and corrective measures International business-Local, regional, national, international and global business— management orientation of overseas businessethno centric, poly centric, region centric and geocentric orientation--reasons for internationalization of business-factors restricting internationalization of business—major global companies in the world.- Export –Import policy of India – Regulation and Promotion of foreign trade in India

20 Hours



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Module II

International business environment: Cultural, social, political and legal, technological, economic and trade environment—natural and demographic environment. Opportunities and threats of Indian companies in international market. – Modes of Entry - exporting – Licensing – franchising contract manufacturing – Management contracts, turnkey projects – Foreign Direct Investments- Theories of FDI-Cost & Benefits to Home & Host countries- Recent trends. Problems and prospects of foreign companies in Indian market.

18 Hours

Module III

Strategy development in international business—the firm as a value chain—global expansion plan:- International business locations- factors influencing locations-factors restricting location. Value chain analysis, risk analysis, cost benefit analysis. Business entry strategy-exporting, licensing, investment, joint ventures, green fiend investment, strategic alliance, global strategic partnerships.

15 Hours

Module IV

International economic institutions and integrations: Types of Trade Agreements-WTO-GATT- TRIPS- TRIMS-Regional economic integration-Levels of economic integrations –Arguments surrounding economic integration-E. U-NAFTA -ASEAN-SAARC-International Monetary Fund— International liquidity and SDRs- World Bank.

10 Hours

Module V

International business functional strategies: International production strategy—international financing strategy—international human resources strategy and international marketing strategy. Stages of Internationalization: International, Multinational, Global and Transnational corporations – strategic orientations – Growth of MNCs - contributing factors – merits and demerits of MNC – transfer of technology – regulation of MNCs-MNCs in India-Contribution of MNCs to India.

17 Hours

References:

1. Francis Cherunilam, *International Business: Text and Cases*, PHI, New Delhi.
2. Shyam Shukla, *International Business*, Excel Books, New Delhi
3. Rakesh Mohan Joshi, *International Business*, Oxford University Press, New Delhi.
4. P. Subba Rao, *International Business*, Himalaya Publishing House, Mumbai.
5. ManabAdhikary, *Global Business Management in an International Economic Environment*, Macmillan, New Delhi.
6. Charles W L Hill, *International Business*, McGraw Hill, New York.
7. Michael Czinkota, *International Business*, Wiley, New York.



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8. Justin Paul, *International Business*, PHI, New Delhi.
Anant Kumar Sundaram and J, Stewart Black, *The International Business Environment: Text and Cases*, PHI, New Delhi.

International Finance

MCM4EF03 International Finance

Module I

International Finance: Meaning, Importance- International financial environment-Risk associated with international finance- International Financial Markets- International Money Markets – Money Market Instruments – International Capital Markets – Comparison of New York, and Indian Money Market – International Bond Market - Recent changes in global financial markets. -International Monetary system- Multilateral financial institutions International Institutions –Brettenwood and **International Monetary Fund (IMF)-Objectives- Role of IMF in International Liquidity- Conditionality’s of IMF lending-World Bank - International Development Association (IDA)-Objectives- International Financial Corporation (IFC)- Objectives- Asian Development Bank (ADB)- Objectives- International trade Centre.**

20 hours

Module II:

International financial markets-foreign exchange market-foreign exchange trading-Cash and spot exchange rates-foreign exchange rate and quotation forward markets- Exchange rate behaviour-cross rates-foreign exchange market participants-SWIFT Mechanism-Forecasting exchange rate-measuring exchange rate movements-Exchange rate equilibrium-factors affecting foreign exchange forecasting-international parity relationship-interest rate parity, purchasing power parity and Fisher effects

20 hours

Module III:

Exchange rate definition- Spot and forward exchange- Exchange rate determination- Theories and models of exchange rate, Purchasing power parity theory, Asset market model, Portfolio balancing model-Exchange rate of rupee- recent trends in exchange rate -convertibility of Indian rupee. Foreign Exchange exposure: Management of transaction exposure-Management of translation exposure- Management of economic exposure- Management of political exposure-Management of interest rate exposure-Foreign exchange risk management-Hedging against foreign exchange exposure-Forward Market-Futures market-options market-swap market-Hedging through currency of invoicing-Hedging through selection of supplying country-Country risk analysis.



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Module IV

20

hours

International capital budgeting-concept, problems associated, evaluation of a project factors affecting risk evaluation, impact on value-Long term asset and liability management-foreign direct investment-foreign portfolio management..

Short term asset and liability management: Working capital management - international cash management- receivables and inventory management-management of short-term overseas financing resources- international banking and money market International Monetary and Financial Environment – International Monetary Investments –International Investments-Types of foreign investment-Significance of foreign investments- Factors affecting international investment

10 hours

Theory 75% Problems 25 % References:

- 1.A.K Seth, international financial management, Galgotia
2. V.K.Bhalla,international financial management, Anmol publications, 2000
3. V.Sharon, International financial management, Prentice hall
- 4.Jeff Madura, international financial management, Asia books
- 5.Eun & Resnick, international financial management, Tata McGraw Hill Publishing co.
6. John Holland, International financial management, Blackwell publishers, Oxford
- 7.Keith Pilbeam “International Finance” Palgrave, New York
- 8.Apte P G. “International Financial Management” Prentice Hall of India New Delhi
9. Alan C. Shapiro “Multinational Financial Management” Prentice Hall of India New Delhi
10. Soderston B O “International Economics” Macmillan London.
11. Cheol S Eun and Bruce G Resnick “International Financial Management” Irwin McGraw Hill, New York
12. Arthur Stonehill et al “International Finance” Pearson Education Asia, Delhi
13. Maurice D Levi “International Finance” Tata McGraw Hill, New Delhi.



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Advanced Strategic Financial Management

MCM4 EF04 Advanced Strategic Financial Management

Module I:

Financial goals and strategy : Shareholder value creation (SCV)– **Economic Value Added (EVA)** - Market Value Added (MVA) – Market – to – Book Value (MBV) — managerial implications of shareholder value creation – Growth ratios – Internal Growth Rate (IGR) – **Sustainable Growth Rate (SGR)**

Module II:

12 hours

Financial strategy for capital structure: Leverage effect and shareholders risk – Capital structure planning and policy – Financial options and the value of the firm – Dividend policy and the value of the firm.

20 hours

Module III:

Lease Financial strategy: Leasing concept–Types–Cash flow consequences of lease – Financial evaluation of leasing - Lessee's point of view – leasing versus buying – NPV method – Equivalent loan method – Evaluation from lesser's point of view – NPV and IRR methods. **16 hours**

Module IV:

Merger strategy: Theories of Merger–Horizontal, vertical and conglomerate mergers – Merger procedure – Valuation of firm – Financial impact of merger – Merger and dilution effect on EPS – Merger and dilution effect on business control.

16 hours

Module V:

Take over strategy: Types of takeovers–Negotiated and hostile bids–Take over procedures – Takeover defences – Takeover regulations of SEBI – Distress restructuring strategy – Sell offs – Spin offs – Leveraged buy outs.



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REFERENCES

1. Vanhorne, James C: Financial Management and policy, Pearson, New Delhi, (Latest edition)
2. Brigham and Ehrhardt: Financial Management, Thomson India, (Latest edition)
3. Chandra, Prasanna: Financial Management, Tata McGraw Hill, New Delhi, (Latest edition) 4.Khan, MY and James PK: Financial Management, Tata McGraw Hill New Delhi, (Latest edition)
5. Pandey IM: Financial Management, Vikas Publishing House, New Delhi, (Latest edition)
6. Gitman, LJ: Principles of Managerial Finance, Harper and Row (Latest edition)
7. Hampton: Financial decision making, Concepts, problems and cases, Prentice Hall of India, New Delhi (Latest edition)
8. Brealey and Meyers: Principles of Corporate Finance, Tata McGraw Hill, New Delhi (Latest edition)



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Financial Markets and Institutions

MCM3EF 02: Financial Markets and Institutions

Module I:

An overview of financial markets: Financial markets–Nature–Functions – money market – Capital markets – Markets for derivatives – Working of stock exchange in India – NSE and BSE, – Role of SEBI- Major international stock markets. 15 hours

Module II:

Commodity markets: MCX, NCDEX, and ICEX–Functions, administration, regulations and general mechanism – International commodity markets – Debt market – Types, functions, instruments – Operational mechanism –Hindrances for the development of debt market. 15 hours

Module III Financial Instruments- issue of financial instruments-Primary issue, Book building process, private placement, offer for sale, buy back of shares –various innovative financial instruments, bitcoin, crypto currency etc 15 Hours

Module IV:

Development financial institutions: AMFI, IFCI, NABARD, SFCs, UTI, SIDBI – Mutual Fund, SEBI guidelines on mutual fund – Provident Fund – Pension Funds – PFRDA – Insurance Companies – IRDA. 15 hours

Module V:

Foreign capital flows: forms of foreign capital–FDI and FPI–FIIs – International financial instruments – ADR, GDR, IDR and Euro bonds – Role of foreign capital in Indian financial system – Trends in foreign capital inflows to India – Regulatory framework for foreign capital flows. 20 hours

References:

1. LM Bhole and JitendraMahakud: Financial Institutions and markets, Tata McGraw-Hill Publishers, (2009).



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2. Shashi K Gupta: Nisha Agarwal and Neeti Gupta, Financial Markets and Institutions, Kalyani Publishers, (2013)
3. S Sachdeva: Indian Financial System, Educational Publishers, (2005).
4. MY Khan: Financial Services, Tata McGraw-Hill publishers (2004) 5.Keith Pilbeam: Finance and Financial Markets, Palgrave Macmillan (2005).
6. Gordon and Nataraj: Financial Markets and Services, Himalaya Publishing House.
7. Bharati V Pathak: The Indian Financial System: Markets, Institutions and Services, Dorling Kindersley India (pvt) ltd (2009).
8. Clifford Gomez: Financial Markets, Institutions and Financial services, Prentice-Hall of India (2008).

Research Methodology

MCM3C13: Research Methodology

Module I

Research: Basic concepts - Meaning–Objectives–Types–Approaches – Significance of research in social sciences – Process of research – Formulating problem – Literature Survey – Hypothesis – Research Design – Types – Exploratory, Descriptive, Diagnostic, Experimental – Sample Design – Collecting, analysing, testing, interpreting and presenting result. **15 hours**

Module II

Population Survey and Sample Study: Population & Sample–Sampling theories - Techniques of sampling – Random and Non-random techniques – Sample Size – Determination of sample size – Sampling Errors – Non sampling Errors – Factors influencing sample size – Optimum sample size – Case Study – Pilot Survey.

Module III



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Data collection: collection of Primary Data–Methods of Data Collection – Observation – Field Survey – **Questionnaire - Interview Schedule** – Preparation of Questionnaire – Process of Interviewing – Collection of secondary data – Sources of secondary data.

1.1.1 10 hours

Module IV

Measurement and Scaling: Variables–Attributes – Process of measurement – Attitude Measurement – Scaling - Scaling Techniques – Graphic Rating – **Likert – Thurstone – Semantic Differential – Stapel** – Dichotomous – Scales – Types of Scales – Scale Values – Validity and Reliability of Scales – Errors in measurement.

20 hours

Module V

Data Processing and Presentation : Field Work–Editing–Classification – Coding – Tabulation – Summarization – Analysis of data – One way ANOVA - Univariate, Bivariate and Multi variable methods - Tools of Analysis – Descriptive Analysis – Inferential analysis – Interpretation – Presentation – **Report Writing - Types of Reports – Contents of Reports – Format of Reports – Documentation Styles- Plagiarism (Theory only).**

15 hours

References:

1. Tandon BC, Research Methodology in Social Sciences, Chaitanya Publishing House
2. Whitney FL, Elements of Research, Prentice Hall o India
3. Ferber R, Research Methods in Economics and Business, Macmillan
4. Deming W Edwards, Sample Design in Business Research, John Wiley
5. Bailey Kenneth D, Method of Social Research, Macmillan
6. Krishna Swamy, Methodology of Research in Social Science Prentice Hall of India.
7. Achalpathi KC, Readings in Research Methodology in Commerce and Business Management, Himalaya Publishing House.



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Business Environment And Policy

MCM1C01 Business Environment and Policy

Module I: Business Environment: Meaning & Elements -Components and significance-Scope-political, Economic, Social, Technological, Legal, Cultural and Labour Environment – Trade Unions – Quality Circles – External Factors Influencing Business Environment – Dimensions of International Business Environment –Challenges

15 Hours

Module II: Structure of Indian Economy: Economic Systems-Economic Planning– Planning Commission and NITI Ayog – Public Sector – Changing Role– Relevance – Public Sector Reforms – Public Private Participation – Privatization and Disinvestments – Fiscal Policy – Monetary Policy – Structure of Union and State Budgets – Sources of Revenue – Management of Public Debt. – GST-History and Development in India

1.1.2 20 hours

Module III: Profile of Indian Economy: New Economic and Industrial Policy–Recent Economic & Tax Reforms in India – GST-Land Reforms – Liberalization – Problems of Growth – Unemployment – Poverty – Regional Imbalances – SEZ – Social Injustices – Inflation – Black Money – Lack of Technical Knowledge and Information – Globalization Various Aspects – Consequences.

1.1.3 15

hours

Module IV: Foreign Direct Investment and Institutional Investment: Forms–Policy - FDI in Retail Trade – Problems and Consequences – FEMA – Multinational Corporations Role and Recent Trends – Problems and Consequences – Competition Law-Import& Export Policies- Start-ups- Digital economy- CRYPTO currency, Fin tech

1.1.4 10 hours

Module V: Environment management-Degradation of Natural Environment-Air pollution, Water



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Pollution, Land Pollution, National Wet land Policy-Madhav Gadgil Committee Report-Kasturi Rangan Report-Global warming-causes & Effects, Climate Change, KYOTO Protocol, Green Financing, Carbon Credit, Environment Protection Act 1986(Basics)-National Green Tribunal Act (Basics) -Consumer Protection Act,1986 (Basics) – RTI 2005(Basics) Salient features of Information Technology Act:2000.

1.1.5 20 hours

References:

1. M. Adhikari: Economic Environment of Business, Sultan Chand and Sons, New Delhi.
Francis Cherunilam: Business Environment, Himalaya Publishing House, Mumbai.
2. Claire Capon: Understanding the Business Environment.
3. K.V.Sivayya and VBM Das: Indian Industrial Economy, Sultan Chand Publications, Delhi.
4. David Baron: Business and Its Environment.
5. Panday G.N: Environmental Management, Vikas Publishing House.
6. Raj Agarwal: Business Environment, Excel Publications, New Delhi.



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Management Theory and Organizational Behavior

MCM1C04: Management Theory and Organizational Behavior

Module I: Introduction to management –management concept-Historical evolution schools of management thought –Major contributors to management thought- Principles of management-modern techniques in management- Japanese Management System-Korean Management system - Leadership and Management-Theories of Management, Theories of Leadership, Quality circle- TQM- Six sigma- Kaizen- Benchmarking –Core competence-Bottom of pyramid approach-MDP- steps in MDP-- - Need for the knowledge of OB – Need for a contingency approach to the study of OB – Emerging challenges and opportunities for OB – the organization as a system – System – System approach to organizational behaviour – Managerial functions – The organization and people.

20 Hours

Module II: Basic psychological process-Perception-Factors influencing perception - Attribution theory – Specific applications in organizations – Learning - Theories of learning – Using learning concepts for self-management – implications for performance and satisfaction – Remembering – Basic motivational concepts – Theories of motivation. HRM approach to managing and controlling performance. Behavioural aspects of Control

15 hours

Module III: Personality–Determinants of personality–Theories of personality–Major personality attributes influencing organization behaviour - Building and maintaining the self-values, attitudes and job satisfaction – Ethical issues in organizational behaviour – Mental and health problems in organizations – role of counselling. Building, leading and managing teams

20 hours

Module IV: Group dynamic and inter group relationships–Characteristics of workgroup – Basic forces of group behaviour – Quality of Work Life-Work Life Balance-Dynamics of effective operating groups – Work group behaviour and productivity - Team management – Styles and skills in leadership and communication – Power and politics in organization – Managing differences and conflicts – managing change – Organization and society.

15 hours

Module: Organisational Culture, Organizational development–Techniques of organizational development Interventions – Grid management – Transactional analysis – Sensitivity training – Process consultancy -Case discussions and analysis. Techniques for managing organisational relationships.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

15 hours

References:

Fred Luthans: Organisational behaviour

Danial C. Fieldman and Hugh Arnold: Managing individual and group behaviour in organization

Corporate Governance And Business Ethics

MCM1C02 Corporate Governance And Business Ethics

Module-I

Meaning and Definition of Corporate Governance- Evolution of Corporate Governance- Major Stakeholders of a Corporate Body and their goals- Communication mechanism of corporate organization with stake holders-Objectives Corporate Governance- Principles of Corporate Governance.

15 Hours

Module-II

Theories and Models of Corporate Governance- Conceptual Framework of Corporate Governance- Legal framework of Corporate and administrative framework- regulatory framework of corporate governance in India- SEBI guidelines and clause 49- Reforms in the Companies Act-Secretarial Audit-Class action-NCLT- Insider trading- rating agencies- green governance- shareholders' activism- corporate governance in PSUs and banks- Legislative framework of corporate governance- an international perspective (UK, USA, Australia, China, Russia, South Africa)

20 Hours

Module-III

Various Committees on Corporate Governance- International- Blue riband Committee-Cadbury Committee- Greens burry Committee- Kings Committee- Securities and Exchange Commission Report-Indian; Birla Committee, Narayanamurthy Committee- JJ Irani Committee, Naresh Committee Report. Uday Kodak Committee Report Corporate Reporting Framework- Reporting of Remuneration- Service Contract of Directors- Financial Reporting of the activities of the company asper clause 49 of the Companies and SEBI Act. IFRS- Need- Importance- Significance-Use.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Module-IV

Elements of Corporate Governance- Board of Directors- Executive Directors- Independent Directors- Appointment, Remuneration- Powers, Duties and Responsibilities- Audit Committee- Composition Power and Responsibilities- Statutory Officers- Duties, Board Committees- Responsibilities and Powers- Board meetings- Whistleblowing and Corporate Governance- The Concept of Whistle blowing-Types of whistle blowers- Whistle blower policy- the Whistle Blower Legislation across countries- Developments in India.

20 Hours

Module-V

Business Ethics- Meaning-scope-Importance-Dimensions-Role of ethics in business-Law ðics-Ethics and values-Important ethical principles in business-The new management philosophy-Ethics in business functional areas-integrity-Sales-HRM-Management of quality. Corporate excellence-corporate culture- Styles &values of management-managing cultural diversity in organisation- Building corporate image-knowledge workers &knowledge mgt.

10 Hours

Suggested Readings:

Books

- 1.Mallin, Christine A., Corporate Governance (Indian Edition), Oxford University Press, New Delhi.
- 2.Blowfield, Michael, and Alan Murray, Corporate Responsibility, Oxford University Press.
- 3.Francesco Perrini, Stefano and Antonio Tencati, Developing Corporate Social Responsibility- A European Perspective, Edward Elgar.
- 4.Sharma. J.P., Corporate Governance and Social Responsibility of Business., Ane Books Pvt Ltd, New Delhi
- 5.Jawahar Lal Corporate Financial Reporting Theory and Practice- Taxman
- 6.Singh S: Corporate Governance-Global Concepts and Practices- Excel Books
- 7.Robert A.G Monks & Nell Minow: Corporate Governance: Wiley
- 8.Bob Tricker: Corporate Governance: Principles, Policies and Practices- Oxford University Press.
- 9.Fernando.AC: Corporate Governance: Principles, Policies and Practices: Pearson Education



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

10. Indian Institute of Corporate Affairs- Corporate Governance: Taxman
11. Indrajit Dube: Corporate Governance- Lexis Nexis
12. Satheesh Kumar. T.N: Corporate Governance: Principles and Practices: Oxford University Press
13. Ghosh.B.N. Business Ethics and Corporate Governance- Mc Graw Hill Education
14. Robert Cobbaut et al: Corporate Governance: An Institutional approach- Kluwer Law International.

Advanced Corporate Accounting

MCM2C06: Advanced Corporate Accounting

Module 1: Group Financial Statements

Group accounts and group structures – consolidation procedures (IFRS 10 /Ind AS 110)- Non-Controlling Interest (NCI)- Goodwill valuation (IFRS 3/Ind AS 103)- Goodwill arising on consolidation – Intra-group transactions and mutual owing – Treatment of unrealised profit- revaluation of assets and liabilities- Treatment of dividend and bonus shares.

20 Hours

Module 2: Accounting for Corporate Restructuring

Accounting for Mergers, Acquisition and Reconstruction (internal and external)- Accounting for liquidation of companies- preparation of Statement of Affairs – Deficiency /Surplus Account- Liquidator’s final statement of account- Receiver’s statement of accounts.

Module 3: Accounting for Taxation

Current Tax Expense –calculation and accounting entries- Deferred Tax – Temporary Difference- TTD and DTD – Deferred Tax Assets and Deferred Tax Liabilities – Deferred Tax Expense and Deferred Tax Income (Deferred Tax Reversal)- Recognition, Measurement, Presentation and Disclosure of Deferred Tax

15 Hours

Module 4: Accounting for Revenue and Leases

Revenue from contact with customers (IFRS 15 / Ind AS 115) – Revenue Recognition model – Variable Consideration- Long term contracts – Revenue recognition from construction contracts Accounting for Leases (IAS 17 / Ind AS 17)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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– Classification of lease – Operating Lease – recognition, measurement , presentation and disclosure in the books of Lesser and Lessee – Financial Lease- recognition, measurement , presentation and disclosure in the books of Lesser and Lessee- New standard on lease (IFRS 16 /Ind AS 116) -major changes in the lease accounting (especially in the books of lessee).

20 Hours

Module 5: Modern Concepts in Accounting

Human Resource Accounting- Forensic Accounting – Social Responsibility Accounting – **Environmental Accounting**- Investment Accounting – Proactive Accounting – Inflation Accounting

5 Hours

References:

1. Shukla and Grewal: advanced Accounts. (S. Chand & Co Ltd. New Delhi)
2. Jain and Narang: Advanced Accounts (Kalyani Publishers, Ludhiana)
3. Sr. K. Paul: Accountancy, Volume-I and II (New Central Book Agency, Kolkata)
4. R.K., Lele and Jawaharlal; Accounting Theory (Himalaya Publishers)
5. Dr. L.S. Porwal; Accounting Theory (Tata Mc Graw Hill)
6. Robert Anthony, D.F. Hawkins & K.A. Merchant: Accounting Text & Cases. (Tata Mc Graw Hill).
7. Dr.S.N. Maheshwari: Corporate Accounting (Viakas Publishing House Pvt. Ltd. New Delhi)
8. Dr. Ashok Sehgal & Dr. Deepak Sehgal; Advanced Accounting (Taxman, New Delhi).

Income Tax: Law, Practice And Tax Planning I

MCM3C12 Income Tax: Law, Practice And Tax Planning I

Module 1: Basic Concepts-Direct and indirect taxes- Capital& revenue- Tax planning, tax evasion, tax management, tax avoidance - residence and incidence of tax- exempted income- Tax planning relating to residence & incidence of tax
10 hours

Module 2 Computation of Taxable Income under different heads-income from salary- house property- income from business/profession- capital gains-other sources – Tax planning relating to different heads of income
20 hours



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 3 Assessment-Clubbing of incomes and aggregation of income – Set off and carry forward of losses – **Incomes exempt from taxes – Deductions in computing total income – Rebates and reliefs of tax- Assessment of agricultural Income – Computation of Agricultural Income – Calculation of tax on integration. Assessment of individuals- AMT- Assessment of HUF -Tax planning related to clubbing and aggregation of income, set off and Carry forward of losses- Agricultural income, Individual Assessment. –Tax planning- Assessment of HUF- Tax planning.**

20 hours

Module 4: Income Tax Authorities: Powers and functions–Provisions of advance payment of tax – Tax payment – Deduction and collection of tax at source – Recovery of tax – Computer applications in tax management.

15 hours

Module 5 : **Procedure for assessment of Income Tax: Filing of return of Income–Voluntary return of income – Statutory obligations for filing of return – Time and documents for filing of returns – Return of loss – Belated returns – Revised returns – Defective returns – PAN – Different types of assessment – Self assessment – Assessment on the basis of return – Best judgment assessment – Regular assessment – Reassessment – Protective assessment.**

15 hours

References:

1. BB Lal, Income Tax, Pearson (Dorling Kindersley (India) Publication, Latest Edition,
2. Dr. H C. Mehrotra and Dr.S P . Goyal, Income Tax including Tax Planning and Management, Sahitya Bhavan Publications, Agra – latest
3. Ahuja GK & Gupta Ravi, Systematic Approach to Income Tax, Bharat Law House, Latest Edition.
4. BB Lal, Income Tax, Pearson (Dorling Kindersley (India) Publication, Latest Edition.
5. AC SampatAyengar, Law of Income Tax, Bharat Law House, Latest Edition.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Income Tax: Law, Practice and Tax Planning I1

MCM3C15: Income Tax: Law, Practice And Tax Planning I1

Module 1: Assessment of firms- (including limited liability partnership) –Computation of book profit-Remuneration to partners –Computation of taxable income and tax liability-AMT-Tax planning regarding Assessment of AOP/BOI- Computation of taxable income and tax liability-AMT-Tax planning regarding Assessment of AOP/BOI

20 hours Module 2: Assessment of Co-operative societies and trusts-Deductions under 80 P-Tax Planning-Trusts- Definition-creation-types-tax exemptions-Assessment of trusts-Tax planning **15 hours**

Module 3: Assessment of Companies: Residential status and incidence of tax-Special Provisions applicable to assessment of total income of companies-Deductions available to corporate assesses – Computation of taxable income of companies and determination of corporate tax liability – Minimum Alternate Tax-Tax on distributed profit of domestic companies- Tax on income distributed to unit holders-Security Transaction Tax – Tonnage Tax.

20 hours

Module 4: Corporate tax planning and managerial decisions: Tax planning in respect of make or buy, own or lease, repair or replace, export or domestic sales, shut down or continue, expand or contract, amalgamate or demerger, invest or disinvest-Financial Management decisions, Capital Structure, dividend policy and bonus shares. **15 hours**

Module 5: Tax planning under various circumstances: Tax planning while setting up of a business-with reference to location, nature and form of organizations-Tax planning related to Special Economic Zones (SEZ), Export Processing Zones (EPZ)and Export Oriented Units (EOUs) – Infrastructure sector and background areas – Tax incentives for exporters.

10 hours

(30% Theory and 70% problems)

References:

1. VK Singhania, Direct Tax’s Planning and Management, Taxman, Latest Edition.
2. VS Sundaram, Commentaries on the Law of Income Tax in India, Pearson Law Publishers, Latest Edition.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. AC SampatAyengar, Law of Income Tax, Bharat Law House, Latest Edition.
3. Bhagmati Prasad, Direct Taxes Laws Practice, WishwaPrakashan, Latest Edition.
4. Kaushal Kumar Agarwal, Direct Tax Planning and Management, Atlantic Publishers, Latest Edition.
5. Dr.H . C Mehrotra and Dr.S.P. Goyal , Income tax including tax planning and Management, Sahitya Bhavan Publications, Latest edition

Investment Management

MCM3EF01 Investment Management

Module I:

Investments: Meaning and concept–Investment objectives–various asset classes – factors in investment decisions- Investment process – concept of risk and return – sources of risk – Measurement of risk and return – Diversification and hedging – ethical investing. 10hours

Module II:

Bond Investment analysis: Types of bonds–International bonds–Bond yields – Yield to Maturity (YTM)-risk analysis is bonds – Bond value theorem – Bond immunization strategies. 10 hours

Module III:

Equity Analysis: Approaches to equity analysis–Fundamental analysis – **Economy, Industry and Company (EIC) analysis – Equity valuation models – Dividend Discount Models (DDM) and Price Earnings Ratio (PER) models – Technical analysis** – Dow theory – Chart and Chart Patterns – Market and



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Mathematical Indicators (Problems)– Efficient Market Hypothesis (EMH) and Random Walk theory- Tests of market efficiency – Critique of Investor rationality – Behavioural Finance.

20 hours

Module IV:

Portfolio analysis and selection: Risk return analysis of investment portfolio – Individual and Interactive risks – measurement of portfolio risks – Risks tolerance and asset allocation – optimal portfolio – portfolio selection models-Markowitz model – Sharpe single index model – Capital Asset Pricing Model (CAPM) – Capital Market Line (CML) and Security Market Line (SML) – Market anomalies : calendar effect, size effect and market overreaction – Arbitrage Pricing Theory (APT) – Multifactor asset pricing Models – Behavioural finance – Behavioural finance theories .

25 hours

Module V:

Portfolio Management: Active and Passive investment strategies–Value and growth investing, contrarian strategies – index investing and tracking efficiency, Portfolio evaluation- Sharpe, Treynor and Jensen measures, Fama’sDecomposition Index – Portfolio revision- Investment accounting

References:

1. Bodie, Zvi, Kane Alex and Alan, J. Marcus, Investments, McGraw Hill.
2. Bhalla, V.K. Investment Management, S. Chand & Company Ltd.
3. Chandra, P. Security Analysis and Portfolio Management, Tata McGraw Hill. 4.Elton, and Gurber, M. Modern Portfolio Theory and Investment Analysis, John Wiley and Sons



CRITERION	I	Curricular Aspects
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Financial Derivatives and Risk Management

MCM4C14 Financial Derivatives and Risk Management

Module I:

Introduction to risk management–Meaning and need–importance–Types of market risk – Risk management issues in business – Financial derivatives– Meaning – Need – Growth of financial derivatives markets in India – Derivative markets – Exchange traded financial derivatives for risk management in India – Participants – Functions – Types of risk management instruments – Forwards – Futures – Options – Swaps – The regulatory framework of derivative trading in India.

16 hours

Module II:

Future's growth and development - Difference between forwards and futures - financial future - Future trading – currency futures – Interest rate futures Pricing and valuation of future contracts – Value at risk.

Module III:

Options–meaning–needs and importance-options and futures-fundamental option strategies-type of option-put-call- Valuation of options -trading strategies of risk instruments-positions in options-stock indices-options in Indian stock market.

Module IV

Risk pricing of options-intrinsic value and time value-pricing at the expiry of contract-factors affecting option pricing-put-call-parity pricing-models of pricing-binomial option-pricing models-Black Schole's pricing methods.

Module V

Swaps-meaning and definition-development-structure of swap dealing for risk management-interest rate swaps-forward swaps and swap option contracts-cancellable and extendable swaps-no generic swaps transactions. Currency swaps - Valuation and pricing of swaps - risk management function of swap transaction.

References:

1. Kevin Dowd-Measuring Market risk, second edition.
2. John C Hull-Options futures and other derivatives, seventh edition.
3. Jayanth Rama Varma, Derivatives and Risk Management, TMH, Latest Edition.
4. Mishra, Financial Derivatives, Excel publishers, Latest Edition.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- SL. Gupta, Financial Derivatives: Theory, concepts and problems, Prentice Hall of India, Latest Edition.
- SS Kumar, Financial Derivatives, Prentice Hall of India, Latest Edition.

Perspectives of Food Science & Technology

FTL1BO1 Perspectives of Food Science & Technology

MODULE I : INTRODUCTION (2 HRS)

Scope of food science & Technology, Functions Of food, Nutrients, Water, carbohydrates, Proteins, lipids, vitamins & Minerals.

MODULE II : COMPOSITION & NUTRITIVE VALUE (5 HRS)

Pulses & legumes, Nuts & Oilseeds, Meat, Fish, Egg & Milk. Structure & Composition Of Wheat & Rice, Classification & Composition Of Fruits, Vegetables & Spices.

MODULE III : FOOD QUALITY ASSESSMENT (3HRS)

Sensory assessment- Appearance of food- Visual perception, colour of foods, Smell, flavor & Taste. Threshold test, Difference test, Ranking test & Hedonic Scale.

MODULE IV : FOOD ADDITIVES (3HRS)

Preservatives, Coloring Agents, Flavour & Flavour Enhancer, Antioxidants, Artificial sweeteners, Stabilizers, Thickening agents, Anticaking agents, Bleaching & Maturing Agents, Flour Improvers, Leavening Agents, Surface Active agents.

MODULE V : HEALTH FOODS (1HR)

Functional foods, Prebiotics, Probiotics, Nutraceuticals, Organic Foods, GM Foods.

MODULE VI : FOOD RESEARCH & FOOD TECHNOLOGY UPDATES (2HRS)

Major centers of Food Research in India- CFTRI ,DFRL,NIFTEM,IIFPT & CIFT. Major Food Industries in India. Journals- Journals of food science & Technology, Indian Food Industry, Beverage Food world, Indian Food Packer, AFST(1).



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REFERENCES :

- S. Manany, N S. Swamy Food Facts and Principles. New Age International Publishers.
- Potter NN , Hotchkiss JH. Food Science. CBS publishers and distributors.
- Murano, Peter S. Understanding Food Science and Technology.
- Sumati pal M V. Fundamentals of Food and N international publishers.

Entrepreneurship & Environmental Science

A13: Entrepreneurship & Environmental Science

COURSE OBJECTIVE

- To familiarize the students with the concept of entrepreneurship.
- To identify and develop the entrepreneurial talents of the students.
- To generate innovative business ideas in the emerging industrial scenario.

COURSE OUTCOME

- To Appreciate the role of Entrepreneur in Economic Growth.
- To Recognize the Contradicting nature Of Industrialization & Sustainable Development.
- To Distinguish the types of Pollution Of Water, Air & Land.
- To Understand basic Principles & applications of pollution control methods.
- To Recognize the significance of Environment policies & Regulations.

MODULE I : FUNDAMENTALS OF ENTREPRENEURSHIP (20 HRS)

Entrepreneur-Types Of Entrepreneur - Difference between Entrepreneur & Intrapreneur. Entrepreneurship in Economic growth. Factors Affecting Entrepreneurial Growth. MSMEs - Definition & Significance in Indian Economy: MSME Steps for starting,promotion measures by government- Incentive & subsidy. Role of Promotional institutions with special reference to KINFRA, KITCO. Identification of business opportunities in kerala- Industry policy,2007. Measures to speedup industrial growth. ED club-mission, objectives & functions. Business Incubation-Benefits & setting up incubation center.

MODULE II: II-PROCESS OF STARTING BUSINESS (16 HRS)



CRITERION	I	Curricular Aspects
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Search for business idea, sources of ideas, idea processing, input requirements: sources and criteria of financing, fixed and working capital assessment; technical assistance; marketing assistance; sickness of units and remedial assistance; preparation of feasibility reports and legal formalities and documentation.

MODULE III: ENVIRONMENTAL CONCERNS (12HRS)

Industrial activity and environment, industrialization and sustainable development- indicators of sustainability- sustainability strategies. Barriers to sustainability, Pollution prevention in achieving sustainability Prevention vs control of industrial pollution, Environment policies and Regulations to encourage pollution prevention, Regulations for clean environment and implications for industries.

MODULE IV: POLLUTION (16 HRS)

Definition of pollutant, types of pollution; Air, Water, Land, noise- adverse effects of pollutants on eco system and human health - Need for effluent treatment and toxicity control.

MODULE V: POLLUTION CONTROL METHODS (16 HRS)

Air standards for cities and industrial areas. Particulate emission control- gravitational settling chambers- cyclone separators, fabric filters, electrostatic precipitators, wet scrubbers, absorbers. Noise pollution measurements and its control. Water standards for portable, agricultural and left-off streams Principles of water treatment -primary, secondary and tertiary treatments.

REFERENCES

1. Fundamentals Of Entrepreneurship, Sangram Keshari Mohanty, Phi Learning Pvt. Ltd.
2. Entrepreneurship development small business enterprises. Poornima M Charantimath, Pearson, 2013.
3. Environment and Sustainable Development , M.H. Fulekar, Bhawana Pathak, R K Kale, Springer Science & Business Media
4. Greening Industry: New Roles for Communities, Markets, and Governments, Volume 1 World Bank Publications, 2000
5. A Text Book Of Environmental Science, Arvind Kumar, APH Publishing, 2004
6. Pollution: Causes, Effects and Control. Roy M. Harrison, Royal Society of Chemistry, 2001
7. Industrial Chemistry, BK Sharma Krishna Prakashan Media, 1991
8. Water Pollution. Agarwal S. K. APH Publishing.

Technology Of Animal Foods

FTL6B16 Technology Of Animal Foods

COURSE OBJECTIVE



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

The course provides a good knowledge on the basic principles involving in animal food industry which includes selection of raw materials, slaughtering techniques, preservation technologies ,byproduct utilization of meat , poultry and fish.

COURSE OUTCOME

- Understand the importance of safe slaughtering methods and its significance in food safety.
- Innovative ideas on the production of various products
- Describe the methods of preservation of different animal products based on their shelf life
- Quality parameters of egg and the preservation methods from ancient to modern technologies
- A clear idea on fish processing Technology.

MODULE I: SLAUGHTER AND INSPECTION OF MEAT (10HRS)

Humane method, Inspection of meat- Antemortem and post-mortem inspection.Slaughter of sheep, pigs, poultry.Post mortem changes, ageing. Structure of meat,Factors affecting tenderness of meat, Effect ofcooking on texture, colour and flavour.

MODULE II : CURED MEAT (10HRS)

Role of ingredients, Methods of curing,Processing of Ham, Bacon.Sausage - classification, emulsion, ground sausage, processing, casings, Factors affecting quality of cured meat.

MODULE III : PRESERVATION (8 HRS)

Refrigeration, freezing, thermal processing, dehydration, irradiation,chemical, antibiotics.

MODULE IV : BYPRODUCTS 6 HRS)

Rendering, Feeds, Hides, Skins, Hoofs, Horns.

MODULE V : EGG (14 HRS)

Grading, Changes during storage.Egg quality- Factors affecting egg quality,Measures of egg quality, Effect of cooking,Factors affecting coagulation, Industrial use of egg.

Preservation of egg: Refrigeration, Freezing,Thermal processing, Dehydration, Coating.

MODULE VI : FISH & FISH PRODUCTS (16 HRS)

Introduction, Spoilage indices **Preservation** Cold storage, freezing, smoking, pickling, canning of fish, Drying **Fish products** Fish protein concentrate, Fish Oils- Body oil, Liver oil, Fish meal, FishEnsilage, Chitosan, pearl Essence, Glue, Gelatin.

REFERENCES

- Gracey JF Collins DS Meat Hygiene ELBS.
- Mountney T. Carmen G Prakhurst R Poultry ProductsTechnology, CBS Publishers.
- Shakuntala Maney Food Facts and principles.
- B. Sreelakshmi, Food Science.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- G. Subbulaksmi, Food processing and preservation.
- Gopakumar K Tropical Fishery Products Oxford.
- Jhingran VG Fish & Fisheries of India Hindustan Publishing Company.
- Biswas KP A Text Book of Fish and Fisheries Technology Tata McGraw hill
- Stadelman, William J.. Egg Science and Technology.

Food Safety, Food Laws & Regulations

FTL6B17 Food Safety, Food Laws & Regulations

COURSE OBJECTIVE

The major objective of this course is to teach the students to understand the concept of food safety and quality management. Students can understand the fundamentals of food sampling, food adulteration and packaging technology. Students can also understand the overall requirements for the food plant sanitation. Students can learn about the current food laws and Regulations.

COURSE OUTCOME

- Upon completion of the food safety regulations and packaging paper students will be able to understand the importance of food safety and hygiene and can apply it at industrial level.
- Students will recognize the national and international standards and practices for food safety and can implement it at industries.
- Students can take new concept of food plant sanitation and apply them to another situation.
- Students can implement the updated FSSAI act at analysis as well as production level.

MODULE I: FOOD SAFETY & HYGIENE (7HRS)

Importance of Food Safety, Food Hygiene, Highrisk food, Low risk food, Danger Zone, Personal Hygiene.

MODULE II : FOOD SAFETY & QUALITY MANAGEMENT (16 HRS)

GHP, GMP, SOP, HACCP(Food contaminants-Physical, Chemical, Biological and Allergens), ISO 22000, ISO 9001, Codex Alimentarius Commission (Codex), FAO.

MODULE III : TRACEABILITY & RECALLING (3 HR)

Objectives and Applications.

MODULE IV : FOOD PLANT SANITATION (8 HRS)

Structural requirements, SSOP, CIP, Chlorination, Detergents, Disinfectants and Sanitizers.

MODULE V : FOOD LAWS & REGULATIONS (10 HRS)

Food Safety and Standards Act, FDA, Evolution in Food laws and regulations- PFA, FPO, AGMARK, BIS.

MODULE VI : FOOD ADULTERATION (10HRS)



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Common Food adulterants and their tests: Milk, Vegetable oil, Spices, Tea, Pulses, Sugar, Honey.

MODULE VII : FOOD SAMPLING (10 HRS)

Objectives, Sample collection, Sampling tools, Sampling procedure, Analysis.

REFERENCES

- Sunetra Rodey. "Food hygiene and sanitation with case studies"
- Richard A sprenger, "Hygiene for Management" Highfield
- B Sreelekshmi; "Food science"
- Puja Dudeja; Amarjeet Singh; "Food safety implementation from farm to fork"
- Sukhneet Suri, Anita Malhotra; "Food science Nutrition and safety". FSSAi Manual; www.fssai.gov.in.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Management Theory and Practices

BBA1B01 Management Theory and Practices

Module I : Evolution of Management: Concept and nature of management -Approaches to management: Classical approach - Scientific, Administrative and Bureaucratic - Neoclassical approach: Human relation and Behavioural - Modern approach(H.V) Quantitative, System and Contingency.

Module II : Management Process: Basic roles and skills of manager –Levels of management- Overview of functions of management: planning, organising, staffing, directing and control - Nature and elements of planning, planning types –MBO - Strategic planning and decision making- Organizing – **Division of labour and work specialization, Delegation, Decentralization, Span of management and Departmentation(H.V).**

Module III : Staffing, Directing and Control: Staffing-Meaning and Importance - Factors affecting and functions of staffing - Directing–Meaning, importance and features of directing - Controlling– Meaning and importance, characteristics and types of controlling-Steps in control process- Techniques of contro(H.V)

Module IV : Modern Practices in Management: Total Quality Management (TQM), Kaizen, Lean Management - Business Process Re-engineering-Open Book Management.

Module V : Ethics and Social Responsibility: Managerial ethics - Factors affecting ethical choices - Ethical issues and ethical dilemma in business - Corporate Social Responsibility (CSR) – Stakeholders - Corporate Philanthropy-Managing company ethics and social responsibility - Concept of Corporate Governance - Indian Ethos for Management - Value-oriented Holistic Management(P.E and H.V).

Reference Books:

1. Koontz, Hand Wechrich, H. Management, Tata McGraw Hill, N.Y.
2. P. Robbins Stephen & Coulter Mary, Management, Pearson Education Asia, New Delhi.
3. Prasad, L. M, Principles and Practice of Management, Sultan Chand & Sons-New Delhi.
4. Sherlekar, Management (Value-Oriented Holistic Approach) Himalaya Publishing



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

House, Mumbai. 5.Khandewal, N.M, Indian Ethos and Values for Managers, Himalaya Publishing House, Mumbai.

Managerial Economics

BBA1C01 Managerial Economics

Module I: Introduction to Managerial Economics: Meaning, Definition, Nature, Scope and Principles of Managerial Economics. **Value Maximisation- Limitations: Sales Maximisation Model and Utility Maximisation Model(E.S).**

10 Hours

Module II: Demand And Supply : Meaning and Determinants of Demand; Demand Function; Law of Demand; Demand Schedule, Demand Curve; Movement along the Demand Curve, Shifts of Demand Curve; Elasticity of Demand: Price, Income and Cross Elasticity; Importance and Methods of Demand Forecasting. **Utility: Concept, Marginal Utility, Law of Diminishing Marginal Utility. Supply: Meaning and Determinants; Law of Supply; Supply Schedule, Supply Curve; Movements on the Supply Curve, Shifts in Supply Curve; Elasticity of Supply(E.S).**

20 Hours

Module III: Production and Cost: Factors of Production, Production Function; Total, Average and Marginal Product; Law of Variable Proportions; Returns to Scale; Production Optimisation; Isoquants. Cost Concepts; Cost Function; Long Run and Short Run Cost Functions, Economies and Diseconomies of Scale.

20 hours

Module IV: Market Structures and Price-Output Determination: Meaning of Market; Types of Market Structures; Concepts of Revenue; Demand and Revenue Relationship. Price and Output Decisions under Perfect Competition, Monopoly and Monopolistic Competition; Pricing Under Oligopoly: Kinked Demand Curve, Price Leadership.

15 Hours

Module V: Business Cycle: Concept, Definition, Features, Types and Phases of Business Cycle. Effects of Business Cycle and Controls of Business Cycle. Economic Forecasting for Business: Economic and Business Forecasting, Uses of Economic Forecasts, Methods of Economic Forecasting, Selecting a Forecast, Evaluating Forecasts(E.S).

15 Hours

Reference Books:

1. H. Craig Petersen , W. Crisewis and Sudhir K Jain, Managerial Economics, Pearson Education.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2. Christopher Thomas and S.CharlesMaurice,ManagerialEconomics,McGraw-Hill.
3. D.N. Dwivedi, Managerial Economics,Vikas publishing.
4. DominichSalvatore ,Managerial Economics, Oxford University Press.
5. P L Mehta ,Managerial Economics, Sultan Chand& Sons.
6. PiyaliGhoshGeetika and Purba Roy Chowdhury, ManagerialEconomics,McGraw-Hill.
7. Thomas, Managerial Economics: Concepts And Applications, McGraw-Hill

Marketing Management

BBA2B03 Marketing Management

Module I: Introduction: Marketing Concept and its Evolution; Nature, Scope and Importance of Marketing; Role of Marketing in Modern Business; Marketing Mix: Four Ps-Extended Ps; Marketing Information Systems; Strategic Marketing Planning – An Overview(E.S).

Module II: Consumer Behaviour: Concept and Determinants of Consumer Behavior - Buying Decision Process - Buying Motives - Buying Roles. Market Segmentation: Concept and Need; Principles; Basis for the Segmentation. Target Marketing and Positioning - Positioning Tools and Strategie(H.V)..

Module III: Product and Price: Concept of Product,Consumer and Industrial Goods(H.V) ;;; Product Line and Product Mix Decisions; Product Life Cycle- Meaning and Stages; Product Planning and Development: Concept and Steps. Packaging- Role and Functions; Branding: Concept and Elements; Price: Concept and Importance, Factors Affecting Price. Pricing Strategies: Price Discrimination, Price Skimming, Penetration Pricing and Discounts. Pricing Methods: Cost Based, Competitor Based and Demand Based Pricing.

Module IV: Promotion: Meaning and Importance, Promotion Mix: Advertising- Definition Features and Functions; Advertising Media Legal and Ethical Aspects of Advertising(P.E); Personal Selling: Meaning, Functions and Steps; Role of a Salesman in Selling Process - Characteristics of a Good Salesman(H.V); Publicity and Public Relations. Sales Promotion: Meaning, Nature and Functions; Types of Sales Promotion- Sales Promotion Techniques

Module V: Distribution: Meaning And Importance - Stages of Distribution - Product Distribution Channels: Concept and Functions of Channels; Role of Intermediaries- Retailing of Products: Formats- Unorganized and Organized; Department Stores, Supermarkets, Hyper Markets, Chain Stores, and Electronic Retailing



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Reference Books:

1. Kotler, Philip: Marketing Management; Prentice Hall, New Jersey.
2. Condiff E.W. and Still, R.R., Basic Marketing Concepts, Decisions and Strategy; Prentice Hal of India, New Delhi.
3. Stanton W.J., Etzel Michael J and Walter Bruce J; Fundamentals of Marketing; McGraw Hill, NY
4. Rorsiter Johan R, Percy Larry: Advertising and Promotion Management; McGraw Hill, New York.
5. Aaker, David and Myers Johan G, et. al,: Advertising Management; Prentice Hall of India; New
6. Ramaswamy, Namakumari, Marketing Management, Mcgraw Hill Education.
7. RajanSaxena ,Marketing Management ,Tata Mcgraw Hill Education.
8. C.N.Sontakki, Marketing Management, Kalyani Publishers.

Professional Business Skills

BBA3A12- Professional Business Skills

Module I : Professionalism : Meaning -Definition – Characteristics - Traits and Qualities of a good professionals - Professionalism in business - Professional Skills: important soft skills for business success- Professionalism in Communication: Verbal Communication: Professional Presentation -- Different Presentation Postures- Written Communication: Email - Significance of Email in business – Email etiquette: format - rules – dos and don’ts - Technical Documentation: Standards – Types(P.E).

Module II ; E-Learning :Introduction of electronic learning - benefits and drawbacks of e-Learning - Online education - Digital age learners - Knowledge resources on internet - E-books, Audio, Video and other means for e-learning- Introduction to e-content development and tools



CRITERION	I	Curricular Aspects
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- Online libraries – MOOCs - The e-Learning as a service Industry - major technologies used in e-learning- different approaches for e-Learning delivery - E-learning in India.

Module III : Business Data Analysis : Features of New Generation Computers – Concept of data analysis – Business Data Analysis – Data Analyst – Types of analysts - organisation and source of data, importance of data quality, dealing with missing or incomplete data- Social Networking Analysis – Big Data Analysis - **Role of Data Scientist in Business & Society - Role of Artificial Intelligence and Intelligent Agents in e-business - Ethical and Legal considerations in Business Analytics(P.E)**

Module IV : Socio_Cyber Informatics: IT and society - Digital Divide – Digital natives-Cyber space- New opportunities and threats - Cyber ethics - Cyber crimes -Types - Cyber Laws – Organisations related with cyber laws-Cyber addictions - Information overload(P.E) - Health issues (H.V)- e- waste and Green Computing –Recent E-governance initiatives in India(E.S)

Module V : Digital Marketing : Introduction to Digital marketing Environment –meaning & Concept – Need for digital marketing – Advantages and disadvantages of digital marketing - Trends in digital marketing- Types of digital marketing – Business models in digital marketing Business to Business (B2B), Business to Customer (B2C), Customer to Customer (C2C), Business to Employees (B2E), Business to Government (B2G) - Online advertising - types of online advertising. Top e-commerce websites around the world and its scenario in India. PPC (Pay Per Click) advertising – Search engine Analytics – search engine ads – social media channels and ads (E.S)

References Books:

1. Professional Business Skills – Lee Pelitz 2nd Edition
2. Peter Norton, Introduction to Computers, Tata McGraw Hill Private Limited, New Delhi, 2009.
3. Alan Evans, ITL ESL, Leslie Lamport, Dolores Etter, Darren George, Kenneth C Laoudon, Gary Rogers, Rainer Handel, INFORMATICS -Technology in Action, Pearson Education, Delhi, 2009.
4. V.Rajaraman, Introduction To Information Technology, PHI Learning Private Limited, New Delhi, 2009.
5. Daniel Minoli&EmmaMinoli, Web Commerce Technology Hand Book, Tata McGraw



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Hill, New Delhi, 2009

6. Godfrey Parkin, Digital Marketing: Strategies for online success, New Holland publishers Ltd, 2009
7. Damian Ryan, Understanding Digital marketing: Marketing strategies for Engaging the Digital generation, Kogan page, 3rd Edition, 2014
7. Jonah Berger, Contagious Why things catch on, Simon & Schuster, 2013
8. Turban E, Armson, JE, Liang, TP & Sharda, Decision support and Business Intelligence Systems, 8th Edition, John Wiley & Sons, 2007
9. Frank J. Ohlhorst, Big Data Analytics, 1st Edition, Wiley, 2012.
10. Efraim Turban, Ramesh Sharda, Jay Aronson, David King, Decision Support and Business Intelligence Systems, 9th Edition, Pearson Education, 2009
11. Microsoft Office 2007 Business Intelligence - Reporting, Analysis, and Measurement from the Desktop, Doug Harts, TATA McGraw-Hill Edition, 2008
12. Data Mining for Business Intelligence: Concepts, Techniques, and Applications in Microsoft Office Excel with XLMiner, Galit Shmueli, Nitin R. Patel, Peter C. Bruce, Wiley Publication, 2010
13. Data Mining: Concepts and Techniques”, Morgan Kaufmann Publication, 3rd Edition, 2011 Data Science for Business – What you need to know about data mining and data-analytic thinking, Foster Provost, Tom Fawcett, O’ Reilly Media Publication, 2013

Corporate Accounting

BBA3B04 Corporate Accounting

Module I : Financial Reporting Standards: Concept of accounting standard - International Financial Reporting Standards (IFRS) and Indian Accounting Standards-IFRS convergence in India - List of IFRS and IndAS with objectives - Conceptual framework - Elements of financial statements - Recognition, Measurements, Presentation and Disclosure(P.E).

Module II : IFRS Converged Indian Accounting Standards: Concept of IndAS- Objective, Scope, Recognition and Measurement of : Inventories (Ind AS 2), Income tax (IndAS



CRITERION	I	Curricular Aspects
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12), Accounting for tangible non-current assets (IndAS 16), Borrowing costs (IndAS 23), Provisions, Contingent liabilities and Contingent assets (IndAS 37), Accounting for intangible assets (IndAS 38).(Basic problems only)

Module III : Redumption of Securities: Redemption of Preference Shares – Rules and Accounting - Redemption of Debentures – Important Provisions - Accounting for Redemption: by conversion, by lot, by purchase in the open market (cum- and ex-interest).

Module IV : Preparation of Financial Statements: Contents of financial statements of a joint stock company as per the Companies Act 2013 - Preparation of Statement of Profit & Loss, Statement of changes in equity, Balance Sheet (IndAS1) and Cash flow statement (IndAS7).

Module V : Accounting Ratios: Concept of ratio – Accounting ratio – Meaning, Uses and Limitations – Classification of Accounting Ratios - Computation of Profitability Ratios, Liquidity Ratios, Solvency Ratios and Activity Ratios.

Reference Books:

1. Chintan Patel, Bhupendra Mantri, Indian Accounting Standards, Taxmann Publications.
2. T. P, Ghosh , Illustrated Guide To Indian Accounting Standards, Taxmann Publications.
3. B. D, Chatterjee, Illustrated Guide To Indian Accounting Standards, Taxmann Publications.
4. M.C. Shukla, T.S. Grewal and S. C. Gupta, Advanced Accounts, S. Chand & Co., New Delhi.
5. S.N. Maheswari and S.K. Maheswari, Financial Accounting.
6. R.L. Gupta and Radhaswamy, Advanced Accounting, Sultan Chand & Sons, New Delhi.
7. Ashok Sehgal and Deepak Sehgal, Advanced Accounting, Volume 2, Taxmann, New Delhi.
8. Jain and Narang, Financial Accounting, Kalyani Publishers.
9. P.C. Tulasian, Introduction to Accounting, Pearson Education.
- 10.

Financial Management

BBA3B05 Financial Management

Module I : Introduction to Finance: Meaning of Finance – Business Finance – Finance Function – Organization Structure of Finance - Financial Management – Goals of Financial Management – Financial Decisions – Role of a Financial Manager.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module II : Financing Decision: Meaning, Importance and Classification of Capital Structure; Finance Structure and Capital Structure; Factors Influencing Capital Structure – Optimum Capital

Structure; EBIT- EPS Analysis. Leverages: Operating, Financial and Combined Leverages. Cost of Capital: Concept and Importance; Types of Cost of Capital: Computation of Component and Composite Cost of Capital.

Module III : Investment Decision: Meaning and Importance of Capital Budgeting – Features – Process – Techniques of Capital Budgeting: Concept and Computation of Payback Period, Accounting Rate of Return, Net Present Value, Internal Rate of Return and Profitability Index (E and S).

Module IV : Working Capital Management- Concepts and Significance of Working Capital – Evils of Excess and Inadequate Working Capital – Determinants of Working Capital – Estimation of Working Capital - Sources of Working Capital -A Brief Overview of Cash Management – Receivables Management and Inventory Management.

Module V : Dividend Decision: Dividend - Meaning and Types; Dividend policy : Meaning and Objectives- Issues Involved in Dividend Policy- Determinants of Dividend Policy – Types of Dividend Policy – **Dividend Policy and Value of Firm (P.E).**

References Books:

1. Prasanna Chandra, Financial Management, Tata McGraw Hill.
2. I. M Pandey, Financial Management, Vikas Publication.
3. Khan and Jain, Financial Management, Tata McGraw Hill.
4. Sharma and Sashi Gupta, Financial Management, Kalyani.
5. S. N Maheshwari, Financial Management. Sultan Chand.
6. R. M. Srivastava : Financial Management , Himalaya Publishers.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Business Regulations

BBA3CO2 Business Regulations

Module I : Business Laws: Introduction – Nature of Business Law – Meaning and definition - Indian Contract Act, 1872: Contract – Definition – Essentials of valid contract(P.E) - Classification of contracts – Offer and acceptance – Consideration – Capacity to contract – Free consent – Coercion – Undue influence – Misrepresentation – Fraud – Mistake – Void agreements – Discharge of contract – Breach of contract and remedies – Contingent Contracts-Quasi Contract(H.V and P.E).

Module II : Special Contracts: Contract of Indemnity: Meaning - Nature – Right of indemnity holder and indemnifier – Contract of Guarantee : Meaning – Nature - Rights and liabilities of surety(H.V) Discharge of surety from liability – Contract of Bailment and Pledge: Rights and duties of bailor and bailee, pledger and pledgee – Contract of Agency : Creation of agency – Delegation of authority Duties and liabilities of principal and agent – Termination of agency(H.V).

Module III : Sale of Goods Act 1930: Contract for sale of goods – Essentials of a contract of sale – Conditions and Warranties – Caveat emptor – Sale by non owners – Rules as to delivery of goods – Un paid seller and his rights(H.V)..

Module IV : The Consumer Protection Act 1986: Objects and scope – Definition of consumer and consumer dispute – Complaint – Goods -Service - Unfair trade practices – Restrictive trade practices - Rights of consumers – Consumer Protection Council – Consumer Disputes Redressal Agencies: District Forum, State Commission, National Commission(H.V)..

Module V : Competition and Information Laws: The Competition Act, 2002: Objectives of Competition Act, Features of Competition Act, Components of Competition Act, CCI, CAT, Offences and Penalties under the Act - Right to Information Act 2005: Objectives of the RTI Act, Scope, Suo-Moto disclosure, Method of seeking information, Eligibility to obtain information, Authorities under the Act(E.S).

Reference Books:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Singh Avtar: The Principles of Mercantile Law; Eastern Book Company, Lucknow.
2. Kuchal M.C: Business Law; Vikas Publishing House, New Delhi
3. Kapoor N.D: Business Law; Sultan Chand & Sons, New Delhi.
4. Chandha P.R: Business Law; Galgotia, New Delhi.
5. Desai T.R.: Indian Contract Act, Sale of Goods Act and.
6. VidhiMadaanChadda, Competition Act, 2002 Law and Practice, Bloomsbury.
7. Government of India: Right to Information Act, 2005.
8. P. K Das, Right to Information Act, 2005, Universal Law Publishing.
9. Relevant Bare Acts.

BBA4A13 - Entrepreneurship Development

Entrepreneurship Development

Module 1: Concepts of entrepreneur: Entrepreneur- Definitions - Characteristics of entrepreneur- Classification of entrepreneur-Entrepreneurial traits -Entrepreneurial functions - role of entrepreneurs in the economic development - Factor effecting entrepreneurial growth – Entrepreneurship – Meaning – definition - Entrepreneur vs Intrapreneur(H.V) - Women Entrepreneurs - Recent development – Problems- Entrepreneurial Development Programmes(H.V and G) - Objectives of EDP - Methods of training - Phases of EDP(H.V).

Module 2: Institutional support and incentives to entrepreneurs- Functions of Department of Industries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)- Functions of National Small Industries Corporation(NSIC)- Functions of Small Industries Development Bank of India (SIDBI) - Khadi Village Industry Commission (KVIC)- Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)-Activities of Science and Technology Entrepreneurship Development Project (STEDP)-Strategies of National entrepreneurship Development Board (NEDB) -Objectives of National Institute for entrepreneurship and small business development (NIESBUD) - Techno park- Functions of techno park Incentives- Importance- Classification of incentives – Subsidy - Types of Subsidy(H.V)



CRITERION	I	Curricular Aspects
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Module 3: Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial estates-Classification-Benefits- Green channel- Bridge capital- Seed capital assistance-Margin money schemes –Single Window System- Sickness-Causes –Remedies- Registration of SSI **18 Hours**

Module 4: Setting up of Industrial unit-(Only Basic study) Environment for Entrepreneurship – Criteria for selecting particular project- Generating project ideas-Market and demand analysis- Feasibility study- Scope of technical feasibility- Financial feasibility- Social cost benefit analysis- Government regulations for project clearance-Import of capital goods- approval of foreign collaboration-**Pollution control clearances(E and S)**- Setting up of micro small and medium enterprises- Location decision- Significance. **16 Hours**

Module 5: **Project Report - Meaning-Definition - Purpose of project reports-Requirements of good report - Methods of reporting - General principles of a good reporting system - Performa of a project report - Sample project report. (The preparation of sample project report shall be treated as an assignment of this course)(P.E).** **18 Hours**

Books Recommended:

1. Shukla M.B. Entrepreneurship and small Business Management,KitabMahal Allahabad.
2. SangamKeshariMohanty, Fundamentals of entrepreneurship,PHI,New Delhi.
3. Nandan H. Fundamentals of Entrepreneurship,PHI, NewDelhi.
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing ,Delhi
5. C.N.Sontakki,ProjectManagement,Kalyani Publishers, Ludhiana.
6. SangamKeshariMohanty. Fundamentals of Entrepreneurship, PHI, NewDelhi
7. Peter F. Drucker- Innovation and Entrepreneurship.
8. Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.
9. MSME Act 2006.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Banking And Insurance

BBA4A14 Banking and Insurance

Module 1 : - Introduction to Banking : Meaning and definition - Origin and development of banking –Customer of a bank - Structure of banking in India - Banks and economic development -Functions of commercial banks (conventional and innovative functions) - Central bank RBI – Functions - Emerging trends in banking. Activity: List out the name of banks as per their different category
Assignment: Procedure for creating an account in a bank **10 Hours**

Module 2 : Negotiable Instruments : Definition - Characteristics - Types - Parties to negotiable instruments -Cheques - Types of cheques - Crossing of cheques - Drafts - Cheque vs. Draft - Endorsement -Significance - Regularity of endorsement - Liability of endorser -Electronic payments. Activity / Assignment: Writing of cheque , writing of challan for Demand Draft, Procedures for a Bank Loan. **15 Hours**

Module 3 : E-Banking-centralized online real time electronic banking (CORE)-Electronic Clearing service (ECS) - Electronic Fund Transfer - Real Time Gross settlement (RTGS)— National Electronic Fund transfer(NEFT)-society for worldwide interbank financial telecommunication(SWIFT) - E- cheque - Any Time Money - ATM.s- Credit card - Debit card-smart card - Internet banking - mobile banking - Tele-banking - financial inclusion - recent initiatives in financial inclusion.

Activity / Assignment: Chelan filling for RTGS, EFT and NEFT: Different types of Cards, the Procedure for application of different cards and the Procedure for blocking cards :Procedure for application or activation of net banking, m-banking and tele-banking.

Module 4 : Introduction to insurance: Concept - **need of insurance-insurance as a social security tool insurance and economic development-principles of insurance - various kinds of insurance - life and general insurance (fire, marine, medical, personal accident, property and motor vehicle insurance) (E.S).**- features-life insurance Vs. general insurance. Activity / Assignment: List out different names of insurance companies



CRITERION	I	Curricular Aspects
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Module 5 : Life insurance-law relating to life insurance-general principles of life insurance contract, proposal and policy—Assignment and nomination - title and claims - general insurance - law relating to general Insurance - IRDA - powers and functions - insurance business in India. Case Study: **Preparation of a proposal for life insurance and how to claim insurance in case of any accident, death or damage(H.V)..**

Reference Books:

1. . Jyotsna Sethi and Nishwan Bhatia’s *Elements of Banking and Insurance*, published by PHI .
2. Indian Institute of Bankers (Pub) Commercial Banking Vol-I/Vol-II (part I& II)Vol- III.
3. Varshaney: Banking Law and Practice.Sultan Chand
4. Dr. P. Periasamy: Principles and Practice of Insurance Himalaya Publishing House, Delhi.
5. Inderjit Singh, RakeshKatyal& Sanjay Arora: Insurance Principles and Practices,Kalyani Publishers,.
6. M.N. Mishra: Insurance Principles and Practice, S. Chand & Company Ltd, Delhi.
10. G. Krishnaswamy : Principles & Practice of Life Insurance
11. Kothari &Bahl: Principles and Pratices of Insurance
12. B.S. Khubchandani, "Practice and Law of Banking",MacMillan India Ltd
13. K.C. Nanda," Credit Banking", Response Book, Sage Publication,

Corporate Regulations

BBA4C03 Corporate Regulations

Module I : Introduction to Companies Act, 2013: Objects of the Act – Salient features of the Act - Meaning and definition of company – Features – Kinds of companies – Private company - Public company – Associate company – Dormant company - One person company – Small company - Government company - Lifting of corporate veil.

Module II : Formation of Companies : Promotion – Role of promoters – Incorporation – Capital subscription – Commencement of business – Pre-incorporation and provisional contracts



CRITERION	I	Curricular Aspects
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- Document of companies: Memorandum of Association – Definition - Contents and alteration
 - Doctrine of Ultravires – Articles of Association – Definition - Contents and alteration –
 Distinction between Memorandum and Articles - Constructive notice of Memorandum and
 Articles – Doctrine of Indoor management – Prospectus – Contents – Statement in lieu of
 prospectus – Liabilities for misstatement.

Module III : Share Capital : Shares – Kinds of shares – Public issue of shares – Book
 building - Allotment of shares - Irregular allotment – Issue prices of shares – Listing of shares
 - Employees stock option scheme - Sweat equity shares - Right shares – Bonus shares - Shares
 with differential rights – Share certificate and share warrant - Calls - Forfeiture – Surrender
 of shares – Buyback of shares – De materialisation and re materialisation of shares – Transfer
 and transmission of shares – Transfer under Depository system.

Module IV : Management of Companies : Board and Governance – Directors: Appointment
 – Position – Powers - Rights - Duties and liabilities – Qualification – Disqualification – Removal
 of directors – Key Managerial Personnel – Introduction to Corporate Governance – Need and
 importance of Corporate Governance – Corporate social responsibility - Securities and
 Exchange Board of India Act 1992 – Objects – Establishment and management of SEBI –
 Powers and functions of SEBI– Securities Appellate Tribunal (SAT)(H.V).

Module V : Company Meetings and Winding up : Requisites of a valid meeting – Statutory
 meeting – Annual general body meeting – Extra ordinary meeting – Board meetings –
 Resolutions – Types - Company Secretary : Qualification – appointment – duties - Winding up
 : Meaning – Modes of winding up – Winding up by Tribunal - Members’ voluntary winding
 up – Creditors’ voluntary winding up – Liquidator: Powers - Duties and liabilities –
 Consequences of winding up(P.E).

Reference Books:

1. M.C. Shukla&Gulshan :Principles of Company Law, S. Chand and Co., New Delhi.
2. N.D. Kapoor : Company Law and Secretarial Practice, Sultan Chand & Sons, New Delhi.
3. Manual of Companies Act, Corporate Laws and SEBI Guidelines”, Bharat Law House, New Delhi.
4. M.C. Bhandari : Guide to Company Law Procedures, Lexis NexisIndia, New Delhi.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

5. Tuteja :Company Administration and Meetings, S. Chand, New Delhi.
6. M.C. Kuchal :Company Law and Secretarial Practice, Vikas Publishing House, New Delhi.
7. Dr. P.N. Reddy and H.R. Appanaiah : Essentials of Company Law and Secretarial Practice, Himalaya Publishers, Mumbai.
8. M.C. Kuchal : Secretarial Practice, Vikas Publishing House, New Delhi.
9. AshokBagrrial : Secretarial Practice, Vikas Publishing House, New Delhi.
- 10.Relevant Bare Act.

Human Resources Management

BBA5B07 Human Resources Management

Module I : Introduction to Human Resource Management: Meaning, definition, importance, scope and objectives of HRM; Evolution and development of HRM; Approaches to HRM- Personal management Vs Human Resource Management; HRM and competitive advantage. HR department- organisational composition, role, functions(H.V).

Module II : Procurement of HR: Meaning and Importance of HR planning ; Job analysis--- process of job analysis, job description, job specification, methods of job analysis; Conventional Vs strategic planning; Recruitment – concept, sources ; Selection – concept , Difference between recruitment and selection, process- test, interview, placement, induction and socialization; retention. (H.V). **12 Hours**

Module III : Training and Development: Concepts; importance; Training and development methods – Apprenticeship, understudy, job rotation, vestibule training, case study, role playing, sensitivity training, In-basket, management games, conferences and seminars, coaching and mentoring; Management Development Programs; Training process outsourcing. (H.V).



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module IV : Performance Appraisal, and Compensation: Performance appraisal -need and Importance, objectives, process and methods. Compensation- Objective, Principles, classification, factors Influencing Employee Compensation(H.V).

Module V : Overview of HRM Trends and Challenges: Strategic HRM, Electronic HRM, Green HRM, Human Resource Information System, HR Audit, workforce diversity, downsizing, work life balance, Labour localisation. (H.V).

Reference Books:

1. Dessler, Human Resource Management, Prentice Hall of India.
2. D.A.DeCenzo and S. P. Robbins,S.L Verhulst, Human Resource Management, Wiley.
3. GrayDesler,BijuVarkkey, Human Resource Management,Pearson Education.
4. K.Aswathappa,Human Resource Management Text and Cases, McGraw Hill Education.
5. VSP Rao, Human Resource Management, Excel Books.
6. Khanka , Human Resource Management, S.Chand
- 7 P.R.N. Sinha, S.P. Shekhar, et al., Human Resource Management, S.Chand
- 8 Raymond Noe;John R. Hollenbeck;Barry Gerhart;Patrick M. Wright,Fundamentals of Human Resource Management, McGraw Hill

Business Research Methods

BBA5 B08 Business Research Methods

Module I : Business Research:Meaning and Definition - Features of Business Research – Phases of Business Research .Theory Building -Induction and Deduction Theory - Concept - Operational Definition - Variable – Proposition. Hypothesis – Types of Hypothesis. Types of Business Research: Basic and Applied – Exploratory - Descriptive and Causal.

Module II : Research Design:Research Design - Research Problem Identification –



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Identifying Research Gap – Setting Of Objectives And Hypotheses – Identifying The Variables - Dependent - Independent And Intervening Variables – Sampling Plan – Sample Size – Sampling Methods –Steps In Developing A Research Design.

Module III : Data and Method of Research: Types of Data – Primary Data: Meaning – Sources. Secondary Data- Meaning - Sources of Secondary Data- Limitation of Secondary Data. Exploratory Research: Objectives - Methods - Experience Survey - Secondary Data Analysis - Case Study - Pilot Study by Focus Group Interview. Method of Primary Data Collection: Survey- Types of Survey- Measurement and Scaling: Nominal - Ordinal – Interval and Ratio Scale – Criteria for Good Measurement – Reliability and Validity. Survey Instrument: Questionnaire and Schedule-Essentials of a Good Survey Instrument.

Module IV : Data Processing and Analysis: Processing Stages - Editing - Coding and Data Entry – Descriptive Analysis under Different Types of Measurements - Percentages - Frequency Table - Contingency Table - Graphs - Measures of Central Tendency ,dispersion and Index Number - Interpretation.

Module V : Report Writing and Presentation: Research Report - Types of Reports – Content of Report – Style of Reporting – Steps in Drafting Reports – Qualities of a Good Report – Documentation – Citation – Footnotes – References – Bibliography – APA and MLA - Formats in Writing References and Bibliography(P.E).

Reference Books:

1. Donald R.Cooper And Pamela S, Schindler: Business Research Methods. Latest Edition, Irwin Mcgraw- Hill International Editions, New Delhi.
2. John Adams, Hafiz T.A. Khan Robert Raeside, David White: Research Methods for Graduate Business and Social Science Students, Response Books. New Delhi.
3. Kothari C. R., Research Methodology: Methods And Techniques, New Age International Publishers, New Delhi.
4. Neresh K. Malhotra: Marketing Research, Latest Edition. Pearson Education.
5. William G. Zikmund, Business Research Methods, Thomson.
6. Wilkinson T.S. and Bhandarkar P.L, Methodology and Techniques of Social Research, Himalaya Publishers.
7. John W. Best And James V. Khan, Research in Education.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

8. Singh A. K., Tests, Measurements and Research Methods In Behavioral Scienc,Bharathi Bhavan Publishers
9. Srivastava , T N and Shailaja Rego,Business Research methodology Mcgraw- Hill
10. Alan Bryman ,Social Research Methods , Oxford University Press
11. Howard Lune , Bruce L. berg ,Qualitative Research Methods for Social Sciences

Operations Management

BBA5B09 Operations Management

Module I : Operations Management: meaning, scope and objectives— OM decisions— historical evolution of OM - interaction of operations management with other areas— manufacturing and non manufacturing operations and their characteristics(H.V).

Module II : Facilities Planning: plant location—factors determining plant location—Product design & Process selection- Types of Processes- Plant layout— Product layout, Process layout, Cellular layout & Fixed position layout—Assembly line balancing- materials handling equipments.

Module III : Capacity Planning: Types of capacity maintenance management types of maintenance -work study—method study & work measurement, work measurement techniques – Time & Motion Study- Components of Time Study.

Module IV : Aggregate Planning: Master production schedule (MPS) – Material requirement planning (MRP) - Objectives. Elements of MRP- Inputs,outputs- Inventory management – opposing views of inventory, reorder point, safety stock, lead time, Basic EOQ model, Inventory classification models.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module V : Quality Control—Concept of quality—quality planning—statistical quality control— controlcharts(X chart and R chart Only)— Seven Tools of Analysis –Control Chart, Pareto Diagram, Ishikawa Diagram, Histogram, Flow Charts, Scatter Diagram, and Stratification- Concept of quality circles(P.E).

References:

1. Russell, Roberta S, and Bernard W.Taylor III, Operations Management, Pearson Education.
2. Chase:Operations Management for Competitive Advantage, Tata McGraw Hill.
3. Buffa, E.S., ‘Modern Production Management’, New York, John Wiley.
4. Adam, E.E. and Ebert, R.J., ‘Production and Operations Management’ Prentice Hall of India,
5. Chary, S.,N., Production and Operations Management’, Tata McGraw Hill
6. Norman Gaither, Greg Fraizer, Operations Management, CENGAGE Learning.
7. KanishkaBedi, Production & Operations Management, Oxford University Press.

Organisational Behavior

BBA6B12 Organisational Behavior

Module I : Organizational Behaviour(OB): Meaning-Features-Nature and Scope of OB-The Basic Assumptions of OB, Major Disciplines and their Contributions to OB; Concepts of Strategic Organisational Behaviour and International Organisational Behaviour. (H.V).

ModuleII : Individual Behaviour: Factors Affecting Individual Behaviour-Basic Psychological Process—Personality,Determinants Of Personality—PersonalityTraits—Perception,Perceptual Process-Factors Affecting Perception—Learning, Theories of Learning—Social Learning-Learning Curve. (H.V).

Module III : Group: Concept of Group Dynamics—Features of Group—Types of Group Behaviour—Formal and Informal Group Behaviour—Group Norms—Group Cohesiveness. Teamwork- Types of Teams-Team Building-Team Roles- Team Norms- Team Cohesiveness. (H.V).



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module IV : Motivation and Leadership: Motivation- Concept, Theories-Maslow’s, Hertzberg’s and McGregor’s, X and Y theories); Financial and Non Financial Motivation. Leadership- Types— Theories (Trait theory, Michigan Studies and Fiedler’s Contingency Model); Modern Approach to Leadership Theories—Leadership Styles(H.V)..

Module V : Stress Management—Meaning, Types of Stress— Causes of Stress Consequences of Work Stress- Conflict, Types of Conflicts— Levels of Conflict, Conflict Resolution- Organisational Development—Meaning, Need, Benefits and Limitations -Steps in OD - Organizational Changes. (H.V).

Reference books:

1. Fred Luthans: Organisational behaviour, McGraw hill Education.
2. Danial C. Fieldman and Hugh Arnold: Managing individual and group behaviour in organization, McGraw hill.
3. Henry Mintzberg: The structure of organization, Prentice Hall.
4. Edwin Gerlof: Organization Theory and Design, McGraw hill.
5. Robin. S. P: Organizational Behaviour, Pearson Education India.
6. Aswathappa: Organizational Behaviour, Himalaya Publishing house.
7. Jai B. Sunhat: Culture and Organisational Behaviour, Sage Texts.

Income Tax

BBA5B10 INCOME TAX

Module I : Basic concepts: Income - agricultural income – person – assessee – assessment year – previous year - gross total income - total income - maximum marginal rate of tax -Residential status – Scope of total income on the basis of residential status - Exempted income under section.

M

odule II : Computation of Income Under Different Heads: Salaries – Allowances – Perquisites – Profit in lieu of salary – Gratuity – Pension - Income from house property: Annual Value of House property – Computation under different circumstances – Deduction from annual value. **30 Hours**



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module III : Profits and Gains of Business or Profession: Definition - Computation – Allowable expenses and not allowable expenses – General deductions – Provisions relating to Depreciation.

M

odule IV : Capital Gains: Definition of Capital Assets – Long term and Short term – Transfers – Cost of acquisition – Cost of improvement – Exempted Capital gains. Income from other sources: Definition - Computation – Grossing up – Deductions and other relevant provisions.

Module V : Total Income and Tax Computation: Income of other persons included in assessee's total income - Aggregation of income and set-off and carry forward of losses - Deductions from gross total income - Rebates and reliefs - Computation of total income of individuals. (P.E).

(Theory and problems may be in the ratio of 30% and 70% respectively)

Note : The applicability of law for the purpose of examination would be the law in force as on 31st March immediately preceding the academic year.

Reference Books:

1. Dr. Vinod K. Singhanian : Direct Taxes – Law and Practice, Taxman publication.
2. B.B. Lal : Direct Taxes, Konark Publisher (P) Ltd.
3. BhagwathiPrasad : Direct Taxes – Law and Practice, WishwaPrakashana.
4. Dr. Mehrotra and Dr. Goyal : Direct Taxes – Law and Practice, SahityaBhavan Publication.
5. DinakarPagare : Law and Practice of Income Tax, Sultan Chand and sons.
6. Gaur & Narang, Income Tax.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Introduction to Social Work

BSWIBOI - Introduction to Social Work

Module 1

Social Work: Meaning, Definitions, Scope, Objectives, Basic Assumptions, Functions and Methods

Module11

Historical development of Social Work: Development of Professional Social Work- USA, UK, India, and Kerala. Development of Social Work education, Professional aspects of Social Work

Module111

Basic concepts related to Social Work: Social Service, Social Welfare, Social Reform, Social Justice, Social Health, Social Security, Social Policy, Social Defense, Social Development, Social Legislation and Social Welfare Administration

Module IV

Basic Philosophy, Core values, and Principles of social work, Code of ethics (NASW), Strength based and Right based approaches to social work

Module V

Exposure Visits to Social Work Agencies (Six agencies)

Reference

1. Friedlander W A, (1974) Introduction to Social Welfare, Prentice Hall,
2. Friedlander, Walter (1977) Concepts and Methods of Social Work, New Delhi, Allyn Bacon



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Gore, MS. (2011) Social Work & Social Work Education, Jaipur, Rawat Publications
4. Wadia, A R. 1968, History & Philosophy of Social Work in India, Bomay, Allied Publishers
5. Bhattacharya, Sanjay. 2003, Social work- An Integrated Approach, Deep and Deep Publications
6. Choudhary, Paul., Introduction to Social Work, New Delhi, Atmaram & Sons
7. Mishra, P D. 1994, Social Work Philosophy & Methods, Inter India Publications
8. Jainendrakumar Jha, Encyclopaedia of Social Work

Fields Of Social work

BSW2B02 - Fields of Social work

Module 1

Fields of Social work - Family & Child Welfare: Foster Care, Adoption Services, Family Counselling Centres, Child Guidance Clinics, School Social Work: Scholastic Backwardness, Learning Disability and Dropouts.

Sex Education, Family life education, Premarital Counseling.

Module 11

Medical & Psychiatric Social Work: Multidisciplinary Approach, Concept of Patient as a Person. Social & Emotional factors involved in disease. Death & Dying. Community Health, Role of medical social worker, Psychiatric settings, Community Mental Health, Role of psychiatric social worker

Module 111

Industrial social work- Problems of industrial workers, Absenteeism, Stress, Occupational Hazards. Criminology & Correctional administration

Module IV

Disaster Management- Crisis Intervention. Working with Elderly. Working with Mentally & Physically Challenged



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module V

Rural & Urban Community Development: Panchayati Raj & Decentralized planning
Rural Camp — Individual report of the camp to be treated as assignments. (Minimum 5 Days)

Reference

1. Stroup, H.H. (1980) Social Work. An introduction to the field. New York, American Book Co.
2. Fink, A.E. et al. (1968) The field of social work. New York, Holt, Rinehart and Winston
3. Wadia, A R. (1968) History & Philosophy of Social Work in India, Bombay, Allied Publishers
4. Gandhi, Anjali (1990) School Social Work: The Emerging Models of Practice in India, Commonwealth Publishers
5. Mary Venus, C.J, Mental Health in Classrooms
6. Encyclopedia of Social Work
7. Crawford Walker, (2008) Social Work with Older people, Learning Matters

Introduction to Social Case Work

BSW3B03 Introduction to Social Case Work

Module 1

Social Case Work- Meaning, Definitions, Scope, Purpose. Case work practice in India. Relation to other methods of social work

Module 11

Social Case Work Relationship. Nature and qualities, **Principles of case work relationship. Qualities and Skills of Case worker**

Module 111



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Components of Social Case Work- Person, Problem, Place, Process.

Case work process- Study, Diagnosis, Treatment, Evaluation & Termination

Treatment methods in case work, direct treatment, administration of practical services and environmental manipulation

Module IV

Tools of Case Work- Observation, Listening Interview, and Home Visits. Case work recording- purpose, principles, types

Module V

Counselling in Case Work- Definition, Meaning, Objectives & Goals, Phases in Counselling. Counselling techniques Reference

1. Aptekar, I--lerbert (1955) The Dynamics of Casework and Counseling, Houghton Mifflin Co.
2. Biestek, Felix (1968) The Casework Relationship, London: Unwin University Book
3. Upadhyay, R. K. (2003) Social Case Work, Jaipur & New Delhi: Rawat Publications
4. Theory & Practice of Counselling & Psychotherapy: Gerald Corey
5. Mathew Grace (1992) An Introduction to Social Case Work, Bombay: Tata Institute of Social Sciences
6. Perlman, Helen Harris (1964) Social Case Work - A Problem Solving Process, London: University of Chicago Press
7. Fuster, J. M., (2002). Personal Counselling. Mumbai: Better Yourself Books
8. Gladding, S. (2013). Counseling: a comprehensive profession. Boston: Pearson



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Introduction to Social Group Work

BSW3B04 - Introduction to Social Group Work

Number of Credits: 4

Module I

Social Group: Definition, types of groups, Primary and Secondary groups. In- group and out-group, Task and treatment groups. Reference group.

Module 11

Social group work - Historical Development, Objectives of group work. Principles of group work. Group Work Process- Associative and dissociative group process

Module 111

Group formation, Stages group development- forming, storming, norming, performing and adjourning (Tuckman), Group dynamics- Communication and interaction patterns, Cohesion, Social integration and influence, Group culture, Group morale-meaning determinants and importance and characteristics of groups with high or low morale.

Module IV

Qualities and Skills of group worker, Role of social worker in group work, group work in Schools, A A groups

Module V

Tools used in Group Work. Methods and techniques used in group work. Referral services, interdisciplinary teamwork. Recording in group work

Reference

1. Trecker, Harleigh B. (1948) Social Group Work- Principles & Practice, The Woman's Press, New York
2. Konopka, Gisela (1983) Social Group Work- a Helping Process Longman Higher Education
3. Toseland & Rivas (2011) An Introduction to Group Work Practice, Pearson



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. Mishra, P D. 1994, Social Work Philosophy & Methods, Inter India Publications

Introduction To Community Organisation And Social Action

BSW4B05 Introduction to Community Organisation and Social Action

Module I

Understanding Community

Concept of community: - Sociological and social work perspective of community Types and Functions of community

Module II

Community organization

Definitions of Community Organization. History of community organisation **Values, Principles and objectives of Community organization**, Community Development- Definition. Similarities and differences between Community Organisation and Community Development.

Module III

Community Organisation Phases and Models

Phases: Study, analysis, assessment, discussion, organization, action, Evaluation, Modification Models of community organization- Locality Development Model Social Planning Model - Social Action Model, Concepts of community participation, community empowerment

Module IV

Skills and Roles of Social Workers in working with Communities

Skills for community organization: Interaction, information gathering and assimilation, observation skills, analytical skills, listening and responding skills, organizing, resource mobilization, conflict resolution, Roles of the Community Organiser

Module V Social Action



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Social Action: Definition, objectives, and Scope of social action, Social action as a method of Social work and Principles, Models of social action, Social Action movements in India

Reference

1. Ross, Murray G (1955) Community Organisation- Theory and Principles, Harper
2. Sengupta, P R (1976) Community Organisation process in India, Lucknow: Kiran Publishers
3. Dunham, Arthur (1969) Community Welfare Organisation Principles and Practice, Crowell
4. Encyclopedia of Social Work in India (vol. I to IV) Govt. of India
5. Bhattacharya, Sanjay (2009). Social Work an Integrated Approach. New Delhi: Deep & Deep Publications Pvt Ltd.
6. Ramagonda Patil, Asha (2013). Community organization and Development An Indian Perspective. New Delhi: PHI Learning Private Limited.

Introduction to Social Work Administration

BSW5B07 - Introduction to Social Work Administration

Module 1

Social Work Administration - Meaning and definition. Administration- Meaning, scope & principles. Organisation, Management, Public Administration. Functions of social work administration

Module 11

Administrative process in welfare institutions- Planning, Organizing, Staffing, Directing, Coordinating and Budgeting. Financial administration-, Fund raising, Accounting, Auditing. Public relations & reports, maintenance of files



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 111

Non- governmental organizations. Registration of Societies and Trusts. Constitution and byelaws. Societies Registration Act, Factors motivating voluntary action. National & International voluntary agencies. Problems of voluntary organisations

Module IV

Welfare programmes for Children, Women, Aged, Destitute & differently abled and SCS & STS. (Institutional & Non-Institutional), Social security schemes of Central & State Governments, Kudumbashree

Module V

Social Welfare Administration in India- National level & State level Social Welfare Programmes- Integrated Child Development Services, Central Social Welfare Board structure and Programmes

Reference

1. Choudhary, Paul., Introduction to Social Work, New Delhi, Atmaram & Sons
2. Goel, S. L., (2010), social Welfare Administration: Organisational Infrastructure Deep & Deep Publications, 2010
3. Sirohi, Anand, (2005) Encyclopedia of Social Welfare: Modern Perspectives on Social Work, Dominant Publishers & Distributors
4. Sachdeva, D.R., (1992), Social Welfare Administration Kitab Mahal
5. Day, Phyllis J & Schiele, Jerome (2012) A new history of Social Welfare Pearson Education



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Gandhian Philosophy and Social Work

BSW5BIO - Gandhian Philosophy and Social Work

Module 1

Foundations of Gandhain Thought

A brief overview about Mahatma Gandhi's life. Foundations of Gandhian Social Thought. Influence of religions and philosophers. The experiences in his life. The basic values — truth, non —violence- eleven vows, seven social evils. Views about Man and society.

Module 11

Gandhian Views on Social Problems

Elimination of social problems- Untouchability, Caste system, Problems of women, Alcoholism. The concept of trusteeship to eliminate economic inequality. Education-concept of Nai -Talim or Basic education

Module 111

Gandhian Concept of Community Development

The Concept of development- antyodaya, sarvodaya

Agriculture and industry-Local source of energy and raw materials- Charka a symbol of self-reliance-village industries, means to achieve Development: - Swadeshi, Panchayats, Constructive Programmes

Module IV

Gandhian Economic Thought

Ethical basis of economics, purity of means, simplicity of life, co-operation, bread labour- self-reliance classless society. Gandhiji's views on industrialization- Problems and Prospectus of large scale industries appropriate technology-Indigenous technology

Module V

Gandhian views of Education



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

The philosophy and social purpose of NaiTalim-value base of an ideal society-Peace, Equality, Human dignity and democracy, relevance of Yoga and meditation. Characteristics of Gandhian Social Work, Gandhi's relevance in today's world. Film Review — "Gandhi", review of the autobiography of Mahatma Gandhi "My Experiments with Truth", Visit to Rural development Agencies based on Gandhian ideologies (Gandhian Ashrams, Gandhi Smaraka Seva Kendras)

Reference

1. Selected works of Mahatma Gandhi — (Vol. 1—5).
2. Vettickal, Thomas Gandhian Sarvodaya: Realizing a Realistic Utopia
3. Thakur, A.K. and Sinha, M.K. (eds). Economics of Mahatma Gandhi: Challenges and Development. 2009; Deep and Deep Publications, New Delhi, India
4. Mathai, M.P., Mahatma Gandhi's World View, Gandhi Peace Foundation Trust
5. Reading Gandhi (Ed): Sujit Kaur Jolly Concept Publishing New Delhi
6. Gangrade, K. D. (2005) Gandhian Approach to Development and Social Work, Concept Publishing Company, New Delhi.
7. Singh, R.B (2006) Gandhian Approach to Development Planning, Concept Publishing Company. New Delhi.
8. Prabhu R.K and Rao, U.R (1987) The Mind of Mahatma Gandhi: Navajeevan, Ahmedabad
9. Gandhi, M.K. India of my Dreams. 2009. Rajpal and Sons Publications, Delhi, India. (Young India 21/2/1929).
10. Gandhi, M.K. Village Industries. Navajeevan Publishing House, Ahmedabad (Harijan 16/11/1934).



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Project Planning and Management For

Social Work

BSW6B11 Project Planning and Management For

Module 1

Project and the concept of people's participation

Project-Definition, features, typology. Need and scope of project planning People's participation in projectplanning and management

Module 11

Steps in participatory project planning

Identifying needs- aspects of situational analysis Determining priorities PRA/PLA methods for needidentification and prioritization. Feasibility assessment Formulating Goals and objectives in a project Preparingaction plan/activity schedule including action, responsibility, time and cost. Logical Framework Approach (LFA), Critical Path Method (CPM), Project Evaluation and Review Technique (PERT)

Module 111

Financial management of a project

Fund raising methods, community resource mobilization, possibilities of grant-in-aid from state/centralGovernments and LSGs, Funding Agencies — National and International Laws and rules regarding fund raising

— 80 G, 12 A, FCRA. Budgeting, Social Cost Benefit analysis, Need and importance of Accounting in a project

Module IV

Monitoring and Evaluation of project

Monitoring-definition, Steps in monitoring, levels of monitoring, Evaluation- definition,



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

difference between monitoring and evaluation, types of evaluation, criteria for evaluation, steps in evaluation process

Module V

Project Proposal Writing

Project title, introduction, objectives, project beneficiaries, activities of the project, strategy of implementation, budget/cost Plan, itemized budget, monitoring & evaluation plan, output/ outcome/ impact, **sustainability of the project and conclusion** . workshop on project proposal writing

References

1. Choudhari, S 2001, Project Management, Tata Mc Graw Hill Publishing Company, New Delhi
2. Desai, Vasanth, 1999, Project Management, Himalaya Publishing house, New Delhi
3. Horine, M Gregory (2013), Project Management. Dorling Kindersley Pvt Ltd, Noida
4. Meenai, Zubair, 2008, Participatory community work, Concept Publishing Company, New Delhi
5. Mukherjee, Neela, 1993, Participatory Rural Appraisal, Methodology and Applications, Concept Publishing Company, New Delhi
6. Roy, Sam M (2002), Project Planning and Management: Focusing on Proposal Writing. Health Association for All, Secunderabad
7. Roy, Sam M (2003), Making Development Organizations Perform. 1--leath Association for All, Secunderabad
8. Stephen, T S (1994). Basic Principles of Project Formulation for Voluntary Organisation. Media Press, Bhuvanesar



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Legal Information For Social Workers

BSW6B12 Legal Information For Social Workers

Module 1

Social Legislation, Social Justice, Social Defense, Social Security. Indian Constitution- Preamble, Fundamental Rights, Directive Principles and Fundamental Duties.

Module 11

Indian Judicial system, Courts- Civil Courts, Criminal Courts, Family Courts, Juvenile Courts, Criminal Procedure Code and Indian Penal Code Prisons-, Probation, Parole.

Module 111

Human rights- evolution, nature, Human Rights Commission, Women's Commission, Child Rights — National Child Rights Protection Council —role and functions, childline Legal Aid, Lok Adalats, Public Interest Litigation

Module IV

Laws for the protection and care of Women, Children, Differently Aabled, SC/ST and senior citizens

Module V

Overview of Social security Legislations- Maternity Benefits Act, ESI Act, Factories Act, Workmen's Compensation Act

References

1. Sharma, Brij Kishore, 2015, Introduction to the Constitution of India, Prentice-Hall of India Pvt. Ltd
2. Chaudhary, Jayant, 2013, Handbook of Human Rights, Dominant Publishers
3. Gangrade K. D., (2011) Social Legislation in India, Concept Publishing Company Pvt. Ltd.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. Kulkarni P. D., Social Policy & Social Development in India
5. Encyclopedia of Social Work in India

Gender and Development in Social Work

BSW6B16 Gender and Development in Social Work

Module 1

Gender — Definition and related concepts: Sex and Gender, Gender Stereotypes, Gender discrimination, Gender Division of Labour, Gender Needs, gender equality and equity, Gender mainstreaming, Gender training Women Empowerment, Women Studies, Gender and Development (GAD), Women in Development (WID)

Module 11

Status & Role of women- Women & Family, Women & Religion, Women & Education, Women & Economy,

Women & Media, Women & Environment, Women & Health, Changing role & status of women in India & Kerala.

Module 111

Gender issues & legislation for women- problems of destitute, widows, unwed mothers, single women, girl children, working women. Domestic violence, dowry death, sexual harassment, female infanticide and foeticide

Module IV

Women & Kerala society- Kerala model of development- Implications for women in family, education, employment, economy, politics, and environment, Impact of Globalisation on women

Module V
Programmes for the development of women- Programmes of Central & State Governments. National & State Commission for Women. Role of NGOs in the empowerment of women Role of social work in working with women.

References



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Anne Cranny Francis, Vendy Waring, Pan Stavropoulos, Gender Studies, Palgrave Mcmilan
2. Andal N, Women and Indian Society: Options and Constraints, Rawat,2002
3. Maya Majundar, Social Status of Women in India, Wisdom Press,2012
4. Mary E John ed. Women's Studies in India, A Reader, Penguin Books,2008

Gender and Development

BSW5D03 Gender and Development

Module 1

Gender — Definition and related concepts: Sex and Gender, Gender Stereotypes, Gender statistics, Gender Bias, Feminism, Women Empowerment, Women Studies. Gender and Development

Module11

Status & Role of women- Women & Family, Women & Religion, Women & Education, Women & Economy, Women & Media, Women & Environment, Women & Health, Changing role & status of women in India & Kerala.

Module 111

Gender issues & legislation for women- problems of destitutes, widows, unwed mothers, single women, girlchildren, working women. Domestic violence, dowry death, sexual exploitation, female infanticide Module IV Women & Kerala society- Kerala model of development- Implications for women in family, education, employment, economy, politics, and environment, Impact of Globalisation on women Module V

Programmes for the development of women- Programmes of Central & State Governments. Legislation to protect the interests of women. National & State Commission for Women.

References

1. Anne Cranny Francis, Vendy, Waring, Pan Stavropoulos, Gender Studies, Palgrave Mc Milan



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2. Andal N, Women and Indian Society: Options and Constraints, Rawat, 2002
3. Maya Majundar, Social Status of Women in India, Wisdom Press, 2012
4. Mary E John ed. Women's Studies in India, A Reader, Penguin Books, 2008

Principles Of Sociology

SGY4(2)CO1 PRINCIPLES OF SOCIOLOGY

Module 1 - SOCIOLOGY: AN INTRODUCTION

- 1.1 What is Sociology? Nature, Scope and relevance
- 1.2 Basic concepts — Society, Social groups, Social institutions, social mobility
- 1.3 Sociology and Common-Sense Knowledge - Sociological Imagination

Module 11 - INDIVIDUAL AND SOCIETY

- 2.1 Socialization — types and agencies and relevance
- 2.2 Social control — types, agencies and relevance
- 2.3 Social structure and social stratification
- 2.4

Module 111 - CULTURE AND SOCIETY

- 3.1 Sociological Perspectives on culture
- 3.2 Dominant culture, Sub Culture and popular culture
- 3.3 Cultural change today: Globalisation, Internet revolution and multi culturalism

Module IV - SOCIETY IN INDIA TODAY

- 4.1 Ethnocentrism and identities of region, religion, language and caste
- 4.2 Gender as an issue-control over women by state, religion, family
- 4.3 Media and hyper-reality



CRITERION	I	Curricular Aspects
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Reference

- Giddens, Anthony, 2006, Sociology, Polity, Ch. 1, 2.
- Mills, C. Wright (2000/1959): The Sociological Imagination, Delhi: Oxford University Press, pp. 3-5, 8-11
- Beteille, Andre (1996) Sociology and Common Sense, Economic and Political Weekly 31(35/37) SpecialNumber (Sep. 1996): 2361-2365
- Haralambos, Michael and Holborn (2014): Sociology: Themes and Perspectives, London: Harper-Collins.
- M. Francis Abraham (2006) Contemporary Sociology: An Introduction to Concepts and Theory, Delhi:Oxford University Press.
- Berger, Peter, 1963, Invitation to Sociology, Doubleday, New York, Ch. 1,2 ,3.
- Macionis, John J., 2005, Sociology, Pearson, Ch. 1, 3
- Peter Worsley - Introducing Sociology

Further References

- On caste issues: S. Joseph. 2005. Identity card (poem — Malayalam/English) Kottayam: DC Books.(Translation 2010: K. Satchidanandan)
- On adivasi issues: Sreemith Sekhar (2013) The Red Data Book: An Appendix (documentary).

Sociology Of Indian Society

SGY4(4)CO2 Sociology Of Indian Society

Module 1 - INDIAN SOCIETY: A SOCIOLOGICAL PERSPECTIVE

- 1.1. The structure and composition of Indian society- Cultural and ethnic diversity, diversities



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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in respect of language, caste, religious beliefs and practices and cultural patterns.

- 1.2 Tribes; weaker section, Dalits, **Women and Minorities**: population profile and related issues. 1.3: Caste: Definition, Characteristics and Changes in Indian Caste System

Module 11 - INDIAN SOCIAL SYSTEM

- 2.1. Family, Kinship and Marriage in India- Definition and functions, Types-Joint and Nuclear families, Monogamy and Polygamy, Primary, Secondary and Tertiary Kinship

- 2.2. Rural and Urban Society in India: Pre and Post Independent Period

- 2.3 Concepts of Social Change in Indian Society- Sanskritisation, Westernisation, Modernization

Module 111 - MAJOR APPROACHES FOR STUDYING INDIAN SOCIETY

- 3.1 Basic premises of Indological Approach (Louis Dumont)

- 3.2 Structural-functionalism (S.C. Dube) and, Marxian approaches (A. R. Desai)

- 3.3 Subaltern Perspective (B.R. Ambedkar)

Module IV - EMERGING SOCIAL ISSUES AND PROBLEMS

- 4.1 Structural: poverty, inequality of caste and **gender**, disharmony — religious, ethnic and regional, minorities, backward classes and communities

- 4.2 **Familial: dowry, domestic violence**, divorce, intra and intergenerational conflict, problems of elderly

- 4.3 Developmental: regional disparities, development induced displacement, ecological degradation and environmental pollution, consumerism, crisis of values

References

1. Ram Ahuja - Indian social System
2. S.C. Dube- Indian Society
3. A. R. Desai - Rural Sociology in India
4. Yogendra Singh — Modernisation of Indian Tradition



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

5. M. N. Srinivas- Social change in India
6. M. N. Srinivas - India's Villages
7. Mukhi - Indian Social System
8. Iravati Karve- Marriage and Family in India
9. Pauline. M. Kolenda - Religion, Caste and Family Structure
10. Shah.A. B. - Tradition and Modernity in India

History, Philosophy and Fields of Social Work

SOW1C01 - HISTORY, PHILOSOPHY AND FIELDS OF SOCIAL WORK

Module I Historical development of social work (10 Hours)

U.K. and U.S.A, Historical development of Social Work in India - Social Reform Movements and their contribution to Social Welfare. Welfare activities in India by Governmental and nongovernmental agencies in the Post Independent Era.

Social Work-related concepts: Social Service, Social Reform, Social Welfare, Social Policy, Social justice, Social Defense.

Module II Concept, Philosophy and approaches to Social Work (14 Hours)

Social Work- Definition, Principles, Core values and Functions.

Philosophical assumptions of Social Work - Democratic frame work, worth and dignity of individual, interacting forces of human behaviour, uniqueness of individuality, change and the potentiality to change, the right for self-direction, participation of clients in the helping process, right to self-fulfillment to the extent of his capacity and within the limits, Society's responsibility to facilitate self- fulfillment of the individual, group or community. Operationalizing cardinal social



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work values, challenges in embracing values.

Sources of Social Work Philosophy: Moral & Religious values in Social work philosophy- Christian, Hindu, Muslim, Buddhist, Gandhian traditions. Secular humanism, Rationalism, Welfarism, Liberalism and democracy, Socialism and human rights.

Module III Social Work Theories, perspectives and Methods (14 Hours)

Introduction to theories of Social Work: Importance - Systems Theory, Humanistic, Psychosocial development theories, Social Learning Theory, Conflict Theory.

Major Perspectives in Social Work: Strengths and Ecological Systems Perspectives

Overview of Social Work Practice Models: Crisis Intervention and Task-Centered, Cognitive-Behavioral, Strengths and Solution — Focused, Narrative, Anti oppressive, Critical Competence

Methods of Social Work- Social Case Work, Social Group Work, Community Organisation, Social work Research, Social work Administration, and Social Action

Role of professional social worker. Core skills of Social Work

Module IV Social Work profession-issues and concerns, Social Work Education (10 Hours)

Identification of Social Work as a Profession, Code of Ethics in Social Work, Issues and concerns of Social

work Profession. Professional Associations for social workers, Importance of continuing professional development of social workers, International Social Work

Social Work education- Multidisciplinary foundation of Social work education, curriculum, courses and specializations.

Field work — objective, components, Supervision- functions and methods, Field work recording- Need and importance, Current trends in social work education.



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Module V Fields of Social Work (12 Hours)

Primary and secondary settings, Role of professional social worker. Core skills for Social Work.

Family and child welfare Settings, Medical and Psychiatric Settings, Industrial Settings, Educational Setting, Correctional setting, Community Development Settings.

Social Work with Children, Adolescents and youth, Women, Gender issues, Aged, Differently abled, SC/ST, migrants, unorganized labourers, abuse, sexual assault, and Domestic violence victims, HIV/AIDS, sexual minorities.

References:

1. Banerjee. G. R (1973) : Papers on Social Work: An Indian Perspective
2. Chordhary, Paul. (1983): Introduction to Social work. New Delhi: Atma Ram & Sons,
3. Gore, M. S. (1965): Social Work and Social Work Education, P. S. Jayasinghe, BombayAsia Publication House
4. Batra, Nitin (2004): Dynamics of Social Work in India, Jaipur : Raj Publishing House.
5. Dinitto, Diana, M. (2008): Social Work Issues and Opportunities in a challenging profession (3* edition). Chicago: Lyceum Books
6. Fink, Arthur et al (1985). The fields of Social Work. Beverly Hills, Calif: Sage Publications
7. Hepworth, Dean H (2010): Direct Social Work Practice-Theory and skills (8¹ edition). New York: Brooks/Cole.
8. Friedlander, Walter A. (1977) : Concepts and Methods of Social Work, New Delhi :Prentice Hall of India Pvt. Ltd.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

9. Nair, T. Krishnan (1981): Social Work Education and Social Work Practice in India, Madras: Association of School of Social Work in India
10. Singh, R.R. (1985): Field Work in Social Work Education, A Perspective for Human Service Profession, New Delhi : Concept Publishing Company
11. Wadia. A.R (1961): History and Philosophy of Social Work in India. Allied Publishers,Bombay
12. Desai, Murli (2002): Ideologies and social Work. Rawat Publications, Jaipur
13. Patel, Chhaya(Ed): Social Work Practice Religio-Philosphical Foundations. Rawat Publications Jaipur
14. Terry Mizrahi, Larry E. Davis (2008) : Encyclopedia of Social Work (20th Edition),Oxford University Press, New York.
15. Upadhay Ashok K., John Rawls (1999)— Concept of Justice, Rawat Publications, Jaipur
16. Vivienne Cree and Steve Myers (2009): Social Work: Making a Difference, RawatPublications, Jaipur.
17. Payne, Malcom (2014) Modern Social Work Theory, Palgrave Macmillan London
18. Gray, Mel and Webb, A. Stephen (ed.) (2013) Social Work Theories and Methods, SageLondon
19. Healy, Karen (2014) Social work Theories in Context Creating Fframeworks for Practice, Palgrave Macmillan London
20. Maclean, Siobhan and Harrison, Rob (2001); Theory and Practice: A Straightforward Guide for Social Work Students, Kirwin Maclean Associates



CRITERION	I	Curricular Aspects
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Sociology and Economics for Social Work Practice

SOWIC02 Sociology and Economics for Social Work Practice

Module I: Sociological Perspectives and theoretical contributions to Sociology (12 Hours)

Sociological perspectives: Functional perspective, Conflict perspective, interactionist perspective.

Contributions of theorists: Durkheim, Auguste Comte, Max Weber, Foucault and Talcott Parson, Amartya Sen.

Module II: Sociological concepts for social work I (12 hours)

Definition of sociology, relationship between Sociology and Social Work

Society: Definition, Society as system of relationships, meaning and characteristics, Culture: Definition, characteristics, cultural change

Status & Role: Types and Characteristics

Socialization: Meaning, theories of socialization, process and agents Social process: Associative and dissociative process

Social institutions — Marriage, family, religion, kinship, education, economic institutions and legal system

Module III: Sociological concepts for social work II (10 hours)

Social Stratification: Characteristics, Gender, caste, class.

Social control: Conformity and deviance; Characteristics, agencies and means of social control
Social change: Nature, characteristics, factors and theories related to social change

Social Problems: Meaning, natures and factors responsible for social problems, Major Social problems in India.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module IV: Introduction to basic economic concepts (12 Hours)

Significance of studying Economics in social work. Basic Economic concepts: Needs, Resources, Production, Distribution and Consumption. Demand and supply. Contemporary economic systems: Capitalism, Socialism and Mixed economy, their features, merits and demerits.

Module V: Development Economics (14 Hours)

Economic Development: Concept, Meaning, under development - Characteristics, causes and consequences Poverty and unemployment in India: Types, Causes, effects and implications. World Hunger- myths, magnitude, causes and remedies.

New Economic Policy: Structural adjustment programmes (LPG) and Stabilization programmes, Impact of NEP

Planning for Development — Economic Planning, meaning, Objectives of Indian Planning, NITI Aayog.

References:

M, A. F. (2006). *“Contemporary Sociology” — An Introduction to Concepts and Theories*. USA: Oxford University Press.

Béteille, A. (2002). *Sociology: Essays on approach and method*. New Delhi: Oxford University Press.

Giddens, A. (2005). *Sociology-Introductory Readings*. Excel Media: New Delhi.

Rao, C. S. (2005). *Sociology*. New Delhi: S. Chand Co.

Singh, Y. (2004). *Ideology and Theory in India Sociology*, Rawat Publications. New Delhi.

Dutt, R. & Sundaram, K.P.M. (2002). *Indian Economy*, S. Chand and Co., New Delhi

Madan, G.R. (2002). *Indian Social Problems*, Mumbai : Allied Publishers Pvt. Ltd.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Professional Skills for Social Workers

SOWIC 04: Professional Skills for Social Workers

Module I: Intra personal and Interpersonal skills (10 Hours)

Significance of understanding self, Meaning of self: Self-awareness, self-concept, self-esteem, self-image and self-acceptance, Factors affecting self: attitudes and values. Techniques of understanding self, SWOT analysis, Jo- Hari window. Self-defeating behaviour and its management. Life skills, Emotional resilience, Emotional Intelligence.

Module II: Relationship skills for social work (13 Hours)

Understanding client's situation and perspective- assessment, genograms, ecomaps, Core relationship qualities: warmth, empathy, genuineness, unconditional positive regard, interviewing skills: creating supportive environment, active listening, silence, reflecting feelings, paraphrasing, clarifying, summarizing, Direct, closed, open ended questions, Professional integrity, Professional boundaries

Module III: Communication Skills (14 Hours)

Communication: Definition, Purpose, Types, process, barriers, approaches in communication, non-verbal communication, Transactional Analysis-ego states, transactions, strokes, life positions, Group discussion, Public speaking, Presentation skills, reflective writing, presentation skills, Writing skills: Minutes, reports, letters, Advocacy letters, case notes, Structure of case notes, legal writing, newsletters, press, media, media releases, Letter to the editor, Literature review, academic writing, referencing and plagiarism.



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module IV: Leadership skills (12 Hours)

Leadership- Introduction to Leadership, Leadership Power, Leadership Styles, Leadership in social work Facilitative and transformational Leadership, Motivation, Motivation enhancement, Group dynamics, Teambuilding and team work, Time Management, Stress management, Goal setting, Managing conflict

Module V: ICT Skills (11 Hours)

Use of ICT in Social Work, MS Office, Various forms of ICT resources, ICT in teaching and learning, Online Learning resources, Introduction to Cyber laws, Cyber-crimes, Cyber ethics

Reference:

- i. Stogdon C and Kitleley R (2010) Study skills for social workers, Sage Publications
2. Mohan K, Banerji M, Developing Communication Skills, Macmillan Publishers India Ltd.
- s. Neil T (2009), People Skills, 3rd Ed., Palgrave Macmillan New York
4. Hamer M (2006), The barefoot Helper: mindfulness and creativity in social work and the caring professions, Russell House Publishing Limited
5. Benson, Jarlath B (2001), Working more creatively with groups, Routledge, New York
- s. Donald S. (1991), The Reflective Practitioner, How Professionals Think in Action, BasicBooks New York [ISBN: 1857423194]

Social Legislation and Human Rights

SOWIC05: Social Legislation and Human Rights

Module 1: Introduction to Social Legislation (8 Hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Social Legislation: Definition, objectives, & Scope. Social Legislation as an instrument for Social change and

Social justice. Process of making social legislation

Indian constitution and social Legislation: Fundamental rights, Fundamental duties and Directive Principles of State policy. Legal system in India: Courts, Hierarchy of courts.

Module II: Human rights (14 hours)

Concept and nature of human rights: Values: Dignity, Liberty, Equality, Justice, and Unity in Diversity. Human rights as Inherent, Inalienable, Universal and Indivisible,

Universal Declaration of Human Rights 1948 and Universal Declaration of Human Responsibilities 1997. International Convention on Economic, Social and Cultural Rights 1966 International convention on Civil and Political Right 1966

UN and its Principal Organs: General Assembly, Economic and Social Council, and Security Council, Subsidiary Organ: Human Rights Council, Specialized Agencies: UNICEF, UNESCO, ILO, WHO and various agencies. Inter-governmental and non-governmental agencies working for human rights.

Statutory Mechanism for Enforcement of Human Rights in India: National Human Rights Commission (NHRC) and State Human Rights Commissions (SHRCs) — Evolution, Composition and their Roles,

Role of a social worker in relation to social legislation and human rights issues — advocacy, campaign, lobbying, networking, educating, guiding, enabling

Module III: Legislations for the Protection of Children and Women (14 hours)

Social relevance, objectives, implications, remedies and critical review

Children

Juvenile justice care and protection act 2015



CRITERION	I	Curricular Aspects
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Laws related to adoption, Child Marriage Act — 2006.

The Protection of Children from Sexual Offences Act, 2012

The Child Labour (Prohibition and Regulation) Amendment Act, 2016

Women

Laws related to atrocities against women as per Indian penal code The Dowry Prohibition Act —1986.

The Protection of Women from Domestic Violence Act, 2005. The Immoral Traffic (Prevention) Act, 1986. The Nirbhaya Act, 2013

Sexual Harassment of Women at Workplace (Prevention, Prohibition and Redressal) Act, 2013.

Module IV: Social Legislations for the Aged, Disabled and other weaker Sections, their social relevance, objectives, implications, remedies and critical review (14 hours)

Aged: Maintenance and Welfare of Parents and Senior Citizens Act, 2007.

Disabled: The Persons with Disabilities (Equal Opportunities, Protection of Rights and Full Participation) Act, 1995.

Backward Classes: The Schedule Caste and Schedule Tribes, (Prevention of Atrocities) Act, 1989.

Social security legislations- An overview

Module V: Introduction to Legal Aid (10 hours)

Legal Aid- Definition, meaning and scope

Legal services authorities act, 1987 — salient features,

The Schemes and Programmes for Legal Aid Services, Lok Adalats

Public Interest Litigation -Meaning and Definition, Nature and Scope of Public Interest Litigation.

Procedure for filing PIL

References:



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. India Government: Constitution of India. Govt. of India Press, New Delhi
2. Social Legislation in India (2 Vols) Hardcover K. D. Gangrade 2011
3. Mathew PD: Public Interest Litigation, Indian Social Institute, New Delhi, **1999**
4. Tapan Bisowal : Human rights, gender and environment Viva books pvt Ltd, NewDelhi, 2006
5. Videh Upadhyay, Public Interest Litigation in India: Concepts, Cases and Concerns: Concepts, Cases Concerns — 2007
- c. Mamta Rao, Public Interest Litigation Legal Aid and Lok Adalats Paperback — 2015
7. People law and justice: A case book of PIL, Vol 2Orient Longman publishers, NewDelhi, 1997
8. Introduction to constittition of India: Vikas publishers hortse pvt Ltd, New Delhi
9. Legal Education Series: Indian Social Institute, New Delhi, 1999
10. Hebstir, R. K. (Ed.) Social Intervention for Justice, Bombay: TISS.
11. Hiittman, E. D. 1981 Introduction to Social Policy, New York: McGraw- Hill.

Social Case Work

SOW2C06: Social Case Work

Module I: Introduction to Social Case Work (8 hours)

Social Case Work as a Method of Social Work: Definition, scope and objectives of Social Case Work, History and Development of Social Case Work in UK, USA and India, Casework and Counseling. **Philosophical assumptions and values of Social Case Work.** Caseworker - qualities and skills.



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Module II: Case work relationship (10 hours)

Definition, qualities and principles of Case work relationship, (Individualization, Purposeful expression of feelings, controlled emotional involvement, Acceptance, Non-judgmental attitude, Client self- determination, Confidentiality)

Tools used in social case work: Relationship, listening, observation, Home visits, Interview, Casework Interview: nature purpose and principles.

Module III: Components and Tools of social casework (16 hours) Components of casework (Perlman’s

model):

Person- client, significant others and collaterals. Problem- need impaired social functioning.

Place- agency, objectives, functions, policies and resources.

Process- Social Casework intervention; psychosocial study, Diagnosis, Treatment, Evaluation, Termination and follow up. Writing a Case work record

Recording: importance, principles and types: Narrative recording, summary recording & verbatim recording,

Module IV: Social Case Work Treatment - Approaches and Models (16 hours)

Environmental modification, Enhancing social support systems, and Direct treatment (Counselling techniques

- guidance, clarification, ventilation, psychological, support, reassurance, confrontation, accreditation, suggestion etc.)

Enhancing the client’s problem solving - assertiveness, Stress management & social skills



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Theoretical approaches relevant to case work. Psychoanalytical, Psychosocial, Diagnostic and Functional approaches.

Models of Casework Practice: Social diagnostic (Richmond), Supportive and modificatory (Hamilton), Problem solving (Perlman), Crisis intervention (Rappaport), Classified treatment method (Florence Hollies), Competence based approach (Elleen Grabrill)

Module V: Case management in Social Case Work (10 hours)

Case management: definition, philosophy, components- Assessment, planning, facilitation, carecoordination, evaluation, advocacy, referral, resource management

Settings of social case work: Primary & secondary, Scope of social case work in various settings, Role and function of case worker in all settings

References:

1. Biestek Felix (1957). Case Work Relationship. Chicago: Loyola University Press
2. Cirace Mathew (1992). Introduction to Social Case Work. Bombay: Tata Institute of Social Sciences.
3. Perlman, H.H. (1957). Social Case Work: A Problem Solving Process. Chicago: University of Chicago Press.
4. Hepworth & Larsen (2010). Direct Social Work Practice: Theory and Skills (Eighth Edition). Belmont, CA: Brooks/Cole/ Thompson.
5. Hamilton. G : Theory and Practice of Social Case Work
6. Hamilton, Gordon (1970) The New York School of Social Work: Theory and



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Practice of Social Case Work, New York and London: Columbia University Press

7. Rameshwari Devi, Ravi Prakash (2004) Social Work Methods, Practices and Perspectives (Models of Casework Practice), Vol. 11, Ch.3, Jaipur: Mangal Deep Publication
8. Brammer. L. M : The Helping Relationship Process and Skills 1985
6. Upadhyay. R K : Social Casework — A Therapeutic Approach.
7. Garrett, Annett (1972) Interviewing — Its Principles and Methods, Family Service Association of America, New York
8. Compton and Galaway: Social Work Process 1979

Social Group Work

SOW2C07 : Social Group Work

Module I: Introduction to Groups (12 Hours)

Understanding groups: Definition, characteristics and significance of groups in society Types of groups — primary and secondary groups

Task groups (forum, committees and work team)

Treatment groups (support groups, educational groups, socialization groups, therapeutic groups,) Developmental groups (self-help groups and support groups) Sibgroups- meaning and types (Cliques, dyads, triads, isolates)

Tools for assessing group interaction - Sociometry and Sociogram. Functional and nonfunctional role



CRITERION	I	Curricular Aspects
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of individuals in group

Module II Group Process (14 Hours)

Typical patterns in group process and interpersonal communication, Group formation, Role, Rank and Relationship, Group norm, Bond, acceptance, isolation, rejection, conflict and control. Impact of group experience on individuals

Group dynamics - Group bond, Sub groups, Decision making, isolation, Leadership, Conflict. Communication and Interaction pattern, Group cohesiveness, Group control, Group culture. Stages of **group development** — Forming, Storming, Norming, Performing and Adjourning **Group morale**- meaning determinants and importance and characteristics of groups with high or low morale.

Module III: Introduction to Social Group Work (9 Hours)

Social Group Work: Definition, characteristics and goals of social group work method. History and evolution of group work as a method — international and Indian context.

Theoretical assumptions underlying social group work, Philosophical assumptions and Values of social group work, Relevance and Scope of Social Group Work

Module IV - Social group work principles and process (13 Hours)

Principles of group work.

Group Worker — Qualities, skills, Role and functions,

Steps in group formation: Need Assessment, formulating objectives, developing plan for group work, Programme planning

Group Formation and Group Development

Group Work Process: Group formation, Beginning Phase, Middle Phase and Ending

Phase Termination phase: Types of termination



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Evaluation: Significance of evaluation, types and methods of evaluation

Module V: Recording in group work (12 Hours)

Importance, Principles, types, strttctrtre of recording,

Techniques of recording to analyze group process and plan strategies for intervention

Applications of Group work in various settings — Health (Hospitals, De-addiction centres and Mental health centres), Children and Adolescents (schools and Child Guidance Clinics) Women development, Family welfare(Family coiinselling centres), Industries, Communities, Correctional institutions.

References:

1. Hepworth, D. H. (2010). Direct Social Work Practice: Theory and Skills (8th Edition). Belmont: Brooks/Cole.
2. Konopka, G. (1963). Social group work. A Helping Process. New Jersey: Prentice Hall.
3. Rivas, R. W. (20t19). Introduction to social group work practice. London: Allyn & Bacon.
4. Siddiqui, H.Y. (2008). Social group work: Theories and practice. Jaipur: RawatPublications.
5. Trecker, H. B. (1972). Social group work: Principles and Practice. Chicago: Follett.Publishing Company.
6. Upadhay, R. (2003). Social Casework: A Therapeutic Approach. New Delhi: RawatPublishers.
7. Zander, D. C. (1960). Group Dynamics. New York: Peterson and Co.



CRITERION	I	Curricular Aspects
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Community Organization and Social Action

SOW2 C 08: Community Organization and Social Action

Module I: Understanding Community and Community Dynamics (10 hours)

Concept of community: - Sociological and social work perspectives of community - geographical and functional community.

Functions of community. Concepts of power and authority; sources of power in communities. Understanding community power structure, Powerlessness and empowerment, Cycle of empowerment.

Leadership in Community Organization: Concept and types of leadership. Role and functions of community leaders. Participation in Community Organization: Meaning, significance and dimensions and levels of participation. Challenges in participation.

Module II: Community Organization as Practice Method (14 hours)

Concepts: - Community organization, community development. Evolution of community practice in the West and in India

Principles of community organization. Emphasis on human rights, multiculturalism, diversity, pluralism and social justice. Theoretical perspectives relevant to community organisation-Systems theory, Learning Theory, Conflict Theory and Social Exchange Theory Phases in community organization- Study, analysis, assessment, organization, action, evaluation, modification and continuation.

Approaches and Models: Rothman's approaches to Community Organisation- Locality Development, Social Planning, Social Action. Paulo Freire and Conscientization. Saul Alinsky and Organised Mass Action.

Approaches to Organizing communities in the Indian Context: The Gandhian method of organizing: Satyagraha, civil disobedience and the philosophy of nonviolence.

Module III: Strategies in Community Organization (12 hours)



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Formation and capacity building of marginalized groups, community level institutions and organisations (e.g- PRIs, people’s organisations), **asset-based community development, leadership building and networking, awareness generation, local services development. Advocacy and coalition building.**

Skills required in community organization practice: Interaction skills, skills in information gathering and assimilation, community mobilization, resource mobilization (external and internal), advocacy, conflict resolution, documentation, networking, training and facilitation, Participatory Rural Appraisal (PRA) Recording: community profiling, recording (administrative and process records; data banks, monitoring report, evaluation reports) and documentation of the community organization processes (documentation of the best practices, case studies)

Module IV: Community Organization Practice in Various Settings (12 hours)

Health, Education, Residential institutions, Livelihood and work, **Natural resource management, Sustainable development**, working with tribal population, Disability, **Working with rural and urban vulnerable communities, displaced population and rehabilitation, disaster response.**

Module V: Social Action (12 Hours)

Social Action: Concept, Objectives, Principles, methods and strategies of social action. Scope of social action in India. Social Movements.

Approaches to Social Action- Freire, Gandhi (Sarvodaya), Alinsky, Radical social work; Rights based approach.

Strategies for social action from various social movements.

Skills- Mediation, advocacy, conflict resolution. Social Action as a method of social work.

References:

1. Ross Murray G, Community Organisation: Theory and Principles, Harper and Row Publication New York, 1985.
2. Arthiir Dunham: Community Welfare Organisation.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Weil, Mary (Ed):- Community Practice. Conceptual Methods, New York: The Haworth Press. Inc 1996.
4. Meenai, Ztibair: Participatory Community work. Concept Publishing Company, New Delhi 2008
5. Siddiqui, H.Y. Working with Communities: An Introduction to Community Work. Hira Publications, New Delhi 1997.
6. Tropman, John E, Erlich, John L; and Jack Rothman: Tactics and Techniques of Community Intervention — F.E. Peacock Publication, Inc, Illinois **1995**
7. Hardcastle, David A., Powers, Patricia R. and Wenocur, Stanley: Community Practice- Theories and Skills for Social Workers. Second Edition 2011
8. Hardina, D.: Analytical Skills for Community Organisation practice, Columbia University Press, New York, 2002
9. Weil, Mary (Ed): The Handbook of Community Practice, Sage Publications, New Delhi, 2013.

Psychology for Social Work

SOW2C09: Psychology for Social Work

Module I: Introduction to Social Psychology (8Hours)

Social Psychology: Definition, Nature and Scope and relevance to social work Social Perception: Nonverbal Communication-Attribution-Theories of attribution. Attitude: Definition, Formation and change of attitudes.

Module II: Individual Behavior in social Context (10 Hours)



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Social Cognition: Meaning & definition, Schemas and Heuristics Prejudiced: Definition and characteristics of prejudices

Sex and Gender, Gender identity and gender stereotypes.

Social influence- Types of social influence, Compliance techniques

Module III: Group Behavior in social Context (12 Hours)

Pro-social behaviour - factors and determinants. Aggression- factors and determinants.

Propaganda: definition, Psychological basis and techniques. Counter acting misleading propaganda

Collective behavior: Characteristics of Audience & crowd. Classification of crowd and audience.

Module IV: Introduction to Mental Health (14 Hours)

Definition, characteristics and determinants of mental health. Mental Health issues in the contemporary society- Alcoholism and drug addiction, Suicide.

Adjustment disorder-post traumatic stress disorder; Anxiety disorder: specific phobia, social phobias, generalized anxiety disorders, obsessive-compulsive disorder.

Module V: Introduction to major Mental Disorders (16

Hours) **Clinical features of schizophrenia, mood**

disorders

Somatic Symptom Disorders, Hypochondriasis, Somatization Disorder, Pain Disorder, Conversion Disorder;

Dissociative Disorders - Depersonalization/ Derealization Disorder, Dissociative Amnesia and Dissociative Fugue, Dissociative Identity Disorder (DID).

Major Childhood disorders- Autism spectrum disorders, Conduct disorders, ADHD, LD, Intellectual Disability



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References:

1. Baron, R.A., & Branscombe, N.R. (2012). *Social Psychology* (13th ed). New Delhi: Pearson Education.
2. Baron, R.A., Branscombe, N.R., Byrne, D., & Bhardwaj, G. (2009). *Sociol Psychology, 12 th ed.* New Delhi: Pearson Education.
3. Baron, R.A., & Byrne, D. (2002). *Sociol Psychology, 10th ed.* New Delhi: Pearson Education
Butcher, J. N., Hooley, J. M., & Mineka, S. (2014). *Abnormal Psychology* (16th ed.). U. S.A: Pearson Education, Inc.
4. Carson, R. C., Butcher, J. N., & Mineka, S. (1996). *Abnormal Psychology and Modern life* (10th ed.). Newyork : Harper Collins College Publishers.
5. Myers, D.G. (2006). *Social Psychology*. New Delhi: Tata MC Graw Hill Inc.
6. Sadock, B. J., Sadock, V. A., & Riiz, P. (2015). *Kaplan & Sadock’s Synopsis of Psychiatry Behavioral Sciences/ Clinical Psychiatry* (11th ed.). U. S. A : Wolters Kluwer.
7. Seligman, M. E. P., Walker, E. P. & Rosenhan, D. L. (2001). *Abnormal Psychology* (4th ed.). Newyork : W. W. Norton & Company, Inc.
8. Taylor S. E., Peplari L.A., & Sears, D.O. (2006). New Delhi: Pearson Education

Theory and Practice of Counselling

SOW2C10 Theory and Practice of Counselling

Module 1 Basics of Counselling Practice (9 Hours)

Counselling: definition need and scope, Types of counseling: Individual and Grotrp Counselling,



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Concepts- similarities & differences: Guidance, Counselling, Social Case Work, Psychotherapy.
Elements in counselling: counsellee, counsellor, coinselling setting.

Module II Counselling Process (14Hours)

Counselling stages: Relationship building, Exploring, assessment and understanding, goal setting and action, Termination and Evaluation Phase

Attitudes and Skills required for the stages of counseling: Contracting, Attending, Reflecting feelings, paraphrasing, focusing, confronting, summarizing, evaluating, goal setting, building relationships, empathic responding, challenging skills,

Module III Techniques and skills in Counseling (12 Hours)

Personal Qualities of an effective counsellor

Skills and Techniques of counselling: Active listening, questioning, clarification, physical attending skills:non-verbal skills: posture, facial expressions and eye contact

Counsellor as a professional: Code of ethics and legal and ethical aspects of Counseling

Module IV Theories and approaches in Counseling Practice (14 Hours)

Psychoanalysis, Client-centered, Gestalt theory, Rational emotive therapy, Behaviour therapy, Cognitive Behavior Therapy, Reality therapy and Transactional Analysis, Strengths based approach, Solution focusedbrief therapy. Mindfulness based stress reduction, Eclectic approach in Counselling

Module V Counselling practice in different settings (11 Hours)

Marriage and Family counselling, Career Counselling, Crisis and Trauma Coinseling; Genetic Counselling, Grief Coinseling, Stress management, Coinselling in the Context of HIV/ AIDS, Counselling services for children and adolescents, Counselling for Elderly, Counselling in Workplace, Counselling for Substance abuse and Addiction



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Referenre:

1. Fuster, J. M., (2002). Personal Counselling. Mumbai : Better Yoiirself Books
2. Gladding, S. (2013). *Counseling : a comprehensive profession*. Boston: Pearson
3. Nelson-Jones, R., (2000). Practical Counselling and Helping Skills. Mumbai : Better YourselfBooks
4. Yeo, Anthony, (1993). Counselling a Problem Solving Approach. Boa Vista : APECA publicationsin India
5. S. Carroll, Michael., (1996). Workplace Counseling: A systematic Approach to Employee Care.London Sage Piiblications
6. G. Patri, V.R., (2005). Counselling Psychology. New Delhi : Attthors Press
7. Rao S. N., (2002). Coiinselling and Guidance. New Delhi : Tata McGraw Hill PublishingCompany Ltd
8. Theory and Practice of Counselling; Richard Nelson-Jones, Sage Sorth Asia Edition2011
9. Elements of Counselling- Scott T Meier, Stisan R Davis
10. An introduction to Counselling- John McLeod
- 11.

Quantitative and Qualitative Methods for Social Work Research

SOW3C 11: Quantitative and Qualitative Methods for Social Work Research

Module I Introduction (8 Hours)

Scientific Research and social work: - Meaning of research, types of research, Social work research — aimsand significance.

Types of Research- Qualitative v/s Quantitative Research, evaluative research, participatory research, actionresearch.

Module II Quantitative Research methods insocial work (20 hours)

Research Problem formulation: - Concepts, Theoretical and operational definition of concepts, Role of theory in research, Variables- Types, Hypothesis- Definition, types, sources and



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significance. Importance and methods of review of literature, Formulation of research proposal, Pilot study. Ethical considerations in research.

Research Design: - Meaning, purposes and types: - Exploratory, Descriptive, Diagnostic and experimental. Quasi-experimental design. Single subject designs, group design, Sampling Techniques- Types, merits and demerits

Measurement-Levels, scales and scaling techniques, Pre-test, validity and reliability

Data collection: - Primary data and Secondary data-types. Methods of data collection - interview schedule, questionnaires, projective techniques.

Data analysis and data presentation in quantitative studies: Editing, Coding, tabulating, Interpreting, Descriptive and inferential Analysis

Report writing- Format, style and content. Qualities of a good research report

Module III Qualitative Research methods in social work (10Hours)

Qualitative Research, Nature of Qualitative Research, Methods of collecting qualitative data- Interviews, Focus groups, Observation, Case study, Ethnography, Action Research, PRA and other forms. Writing-up qualitative studies. Principles of Triangulation.

Module IV Statistical Methods (8 Hours)

Nature and purpose of statistics — rise of statistical methods and limitations of statistics in social work research. Tabulation of data — purpose and basis of classification Frequency distribution- construction of frequency tables, graphic and diagrammatic presentation of data- Bar chart, Pie chart, Histogram, Frequency curve and Ogive. Normal distribution.

Module V Theoretical understanding of Descriptive and Inferential statistics (14 Hours)

Meaning, relevance, uses, merits and demerits of measures of central tendency, Measures of dispersion (Range, Quartile deviation, Mean deviation, Standard Deviation)

Meaning, relevance, uses, merits and demerits of measures of Correlation (Karl Pearson’s Coefficient of correlation and Spearman’s Rank correlation)



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Meaning, relevance, uses, merits and demerits of Chi square, ‘t’ test, and ANOVA Use of software packages in data analysis — SPSS

References:

1. C. B. Gupta, V. G. (2009). *Introduction to Statistical Methods*. New Delhi: Vikas Publishing House Pvt Ltd.
2. CresSOWell, J. W. (2007). *Qualitative enquiry & research design: Choosing among five approaches*. New Delhi: Sage Publication.
3. CresSOWell, J. W. (2009). *Research Design: Qualitative, Quantitative and mixed methods approaches*. New Delhi: Sage Publications.
4. CreSOWell, J. W. and Clark, V.L. (2011). *Designing and Conducting Mixed Methods Research*. New Delhi: Sage Publications.
5. D.K, L. (2000). *Practice of Social Research: Sociol Work Perspective*. New delhi: Rawat Publications.
6. Mark, R. (1996). *Research Made Simple: A Handbook for Social Workers*. New Delhi: Sage Publications Inc.
7. Rosenthal, J. A. (2012). *Statistics and Data Interpretation for social work*. New York: Springer publishing company.
8. Schneider, R. A. (2003). *Eiasic statistics for socinf workers*. Maryland: Un‘iversity press of America.

Participatory Project Planning and Training

SOW3C12 Participatory Project Planning and Training

module I: Development Projects (10 Hours)



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Meaning and purpose, Programme vs. project

Principles in development project: **sustainability**, development direction, concern for the marginalized. Planning in Local Self-Governing Institutions and Community Based Organisations

Environmental Impact assessment [EIA], Gender Impact Assessment [GIA]

Module II: Project Identification and Planning (12 Hours)

Need Assessment, Project Formulation -Setting Goals and objectives, feasibility and viability, cost benefit and cost effectiveness analysis, Action plan, budgeting, time schedule, Different models of preparing development projects Planning for a Project - Development of vision & mission statement, strategic planning, Log frame approach, results frame work, theory of change, **Risk analysis and management** /Risk matrix, Gant chart, Network analysis, Critical Path Method

Identification of beneficiaries

Resource mobilization- sources and strategies, Preparing project proposals

Module III: Project Implementation and Evaluation (14 Hours)

Monitoring and Evaluation

Monitoring, evaluation, supervision, review- meaning and definition, Need for M& E, challenges, key M & E activities, Baseline and Endline studies, process documentation, output tracking & outcome monitoring, key data collection tools for M & E- MSC (most significant change) Case study, interviews, stories, life history and interviews.

Measurement of outcomes/Impact assessment, Preparation of monitoring and evaluation reports, Various Models and methods of M&E like PME, Gap analyses, Social auditing. Public relations and marketing of social projects, Social entrepreneurship. **Practical sessions in project proposal writing and implementation.**

Module IV: Participatory training (12 Hours)



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Participatory training- Significance, principles and Philosophy, Difference between conventional training and participatory training. Adult learning, Principles of adult learning.

Social work and participatory training - significance.

Steps- Pre-training phase: designing- conducting training needs assessment, formulation of objectives, identifying and sequencing content, choosing methods, developing modules, readers. Post —training phase: Monitoring and evaluation — types, methods, follow up of training and report writing

module V: Methods in facilitation and training (12 Hours)

Lectures, Brainstorming, discussion exercises, focus group discussion, checklists, rising visual images, simulation, case studies, learning games, role plays, demonstration, quiz, stories and songs and field visits.

Skill Training: Workshops for Street Theatre, Designing of Posters and other low-cost participatory media, developing newsletters, digital stories.

References:

1. Chandra Prasanna, Projects: Planning, Analysis, Selection, Implementation, and Review, TataMcGraw Hill Pub. Co. Ltd, 1995.
2. Desai, Vasant., Project Management Preparation Appraisal, Himalaya Publications, 1997
3. Ghosh, A.S. Project Management. Anmol Piiblishers. New Delhi, 1990
4. Roy, M. Sam, Project Planning and Management — Focusing on Proposal Writing, CHAI,Secunderabad.
5. Lock, Dennis, Handbook of project Management, Jaico Publishing House, Delhi, 1997
6. Mohsin M, Project Planning and Control, Vikas Publishing House Pvt. Ltd, 1997
7. PtittaSOWamaiah.K, Aspects of Evaluation and Project Appraisal, Popular Parkashan, 1978.



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8. Vasant Desai, Project Management: Preparations, Appraisal, Finance and Policy, HimalayaPub. House, Delhi, 1997.
9. Reidar, Dale: Evaluating Development Programmes and Projects. Second Edition, SagePiublications,2004
10. Mathew .T.K.: Project Planning, Formulation and Evaluation CBCI Centre, New Delhi.
11. Agochiya Devendra 2002. Every Trainer’s Handbook. Sage Publication New Delhi
12. Chatterjee, Bhasker 2004. ICT for Basic Education and Literacy: Country Study for India.Delhi: UNESCO
13. Chambers, Robert. 2002 Participatory Workshops: A Sourcebook of 21 Sets of Ideas andActivities Earthscan UK
14. Abreu, Desmond, D. Participatory Evaluation, PRIA, New Delhi.

Community Health

SOW3C13: Community Health

Module I: Basic concepts in health (14 Hours)

Definition and meaning- Health, Disease, Illness, Wellbeing, Positive health, determinants of health, Spectrum of health, Community Health, Right to health, concepts of prevention, iceberg phenomenon of diseases, Cultural factors in health and disease, Multiple causes of disease, Biopsychosocial aspect of health and illness. Health Education- Purpose and methods.

Health Planning in India, Health for all and primary health care, attributes & principles of primary health care, Community health team and functions, Major health Programmes in India, National Health Mission, School Health Programme.



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Module II: Introduction to major Health problems (14 Hours)

Epidemiology, etiology, clinical picture, treatment and prevention of communicable and non-communicable diseases, TB, HIV/AIDS, life style diseases, Cardiovascular diseases, hypertension, Diabetes, obesity. Accidents and injuries.

Immunization: significance, major vaccine preventable diseases.

Impairment, Disability, handicap, Types of Impairment, Causes, and Consequences of Disability, Needs and problems of persons with disabilities.

Rehabilitation-. Definition, principles, types: medical, educational, psychological vocational. Rehabilitation

— Social worker as a member of the multidisciplinary rehabilitation team, rehabilitation counselling.

Module III: Environmental health (10 Hours)

Air pollution, water pollution, poor housing, climate change, health hazards of accumulated solid waste. Environment sanitation, Food sanitation. National and International health funding organizations WHO, UNICEF, UNDP, UNEP, UNFPA, DFID, FAO, UNESCO, Rotary International, USAID.

Module IV: Community health aspects of nutrition (12 Hours)

Classification of foods, introduction to nutrition, Macro and micro nutrients, Mineral deficiencies, Assessment and management of malnutrition, Nutritional rehabilitation, Nutritional supplements, balanced diet, Community nutritional programmes, Approaches to nutrition education. Food adulteration, Food borne disease.

Module V: Legislations pertaining to health (10 Hours)

Medical Termination of Pregnancy Act, Prevention of Food Adulteration Act, The Pre-Conception and Pre-Natal Diagnostic Techniques (Prohibition Of Sex Selection) Act (PCPNDT



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Act), Mental Health Act, Public Health Act.

Reference:

1. Park, J. E., & Park K. (2009): Text book of Preventive and social medicine. Jabalapur: Banarsidas. Bhanot
2. Srinivasan K (1998). Basic Demographic Techniques and Applications, Sage Publications,
3. Goel, S L (2005), Population policy and Family Welfare, New Delhi : Deep and Deep publications
4. World Health Organization (2000), Towards better child health and development: integrated management of childhood illness (IMCI), World Health Organization
5. Cannon Ida M. 1952 On the Social Frontiers of Medicine, Harvard University Press, Cambridge
6. Miller R. S 1982: Primary Health Care More than Medicine, Prentice hall Inc, London
7. Sanjivi K S (1971): Planning India's Health. Orient Long Man Madras
8. Phillips D R (1990) Primary Health Care-Health and Health Care in the Third World, Longman Scientific & Technical,
9. Gupta Piyish, Ghai O.P (2013), Text Book of Preventive and Social Medicine. CBS Publishers, New Delhi



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Health Care Social Work

SOW3E101 Health Care Social Work

Module I: Historical foundations of Social work in Health Care - UK, USA, India

The concept of patient as a person, social and emotional factors involved in illness, Hospitalisation and its implications on patient and family, Social work’s biopsychosocial approach to health care, Limits of medical approach, Psychosocial issues related to health- disease related, treatment related.

Module II: Social workers role on health teams (13 Hours)

Social Work assessment in health care, Case management, Case conferences, Patient advocacy, Team work, multidisciplinary approach in health care, Use of methods of social work in health settings, Role and functions of social worker, Skills and qualities of Health Care Social worker

Module III: Health Care Social Work- Practice settings (15 Hours)

Acute and chronic care, Community Care, Chronic disease management, Palliative Care, End of life Care, Hospice care, Death and dying, bereavement., Psycho-social impact of cancer, Oncology Social work, : End-stage renal diseases- Psycho-social aspects, HIV/AIDS, Sexually Transmitted diseases, Organ donation and transplantation, Geriatric health care, Paediatric settings, Primary Health Care, Substance use disorders, addictions and compulsive behaviours: Cyber addiction, Adolescent health, Reproductive Health and Family Health.

Module IV: Social Work Interventions (12 Hours)



CRITERION	I	Curricular Aspects
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Assessment, Care Planning, Direct counselling, Information and education, Wellness training, Referral services, patient advocacy, Support groups for patients and carers, Motivational Enhancement therapy,

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Rural Community Development and Governance

SOW3E201 Rural Community Development and Governance

Module IV: Rural Development (14 Hours)

Concept of Rural Development and its objectives. Various Approaches to rural development.

Local Economic Development, Asset Based Community Development Rural Development policies in India. Administration of Rural Development at Central and State Levels

Rural development programmes including poverty alleviation programmes and implementation strategies, Different intervention strategies - government and NGOs.

Rural Credit: Current trends, Microfinance — Scope and challenges

Rural Cooperatives: concept, scope and limitations of the cooperative movement Social Work and Rural Development. Scope and challenges

Module V: Governance (12 Hours)

Major concepts: Governance, Good Governance, Accountable democracy, Panchayati Raj, Decentralisation. Historical development of Panchayati raj, national level committees in the evolution of Panchayati Raj (Balwantrai Mehta, Ashok Mehta, Singhvi committees)

Constitutional provisions, 73rd Constitutional Amendment Act 1992, Panchayati Raj Institutions- Three Tier Governance. Gender mainstreaming in rural governance. Panchayati Raj in Kerala Structure, powers and functions of Panchayati Raj Institution. Gramsabha - role and importance Sources of funds for Panchayats.



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References:

1. Singh, Katar, Rural Development- Principles, Policies and Management,3'
^dEdn. SagePublications, New Delhi 2009
2. Jain, Reshmi, Communicating Rural Development Strategies and Alternatives. RawatPublications, New Delhi, 2003.
3. Singh, Surat, (Ed) Decentralised Governance in India- Myth and Reality, Deep and DeepPublications. New Delhi, 2004
4. Rath, Govind Chandra:Tribal Development in India -The Contemporary Debate SagePiublications, New Delhi 2006
5. John Harriss (Ed.) Rural Development: Theories of peasant economy and agrarian change, Rawat Publications, New Delhi, 2017
6. G D Banerjee, Issues on Rural Finance Infrastructure and Rural Development Jain Book Depot, New Delhi, 2010
7. Anil Kumar Jana (Ed.) Decentralizing Rural Governance and Development: Perspectives, Ideas and Experiences, Rawat Publications, New Delhi, 2015
8. Sidhartha, Rural Development Administration, Jain Book Depot, New Delhi 2015

Urban Community Development and Governance

SOW3E202: Urban Community Development and Governance

Module I: Concepts (10 Hours)

Urban, urbanism, urbanization, urban development. Theories of urban development, Trends in urbanizationand its implications.



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Changing Urban communities: Infrastructural development, growing heterogeneity, Merging of fringe villages, the 'global city' and socio-cultural and economic implications

Module II: Urban social problems (12 Hours)

Overcrowding and pressure on infrastructure and amenities, urban disorganization and maladjustments, urban migration, Problems related to pollution, waste disposal and sanitation, crime and juvenile delinquency. Urban housing and slums.

Displacement -Development Projects (Highways, Special Economic Zones, Large scale industries, Commercial Complexes etc.)

Problems in Kerala's cities.

Module III: Poverty, Livelihood and Informal Sector (14 Hours)

Urban poverty: Magnitude, causes and implications, manifestations of poverty

Livelihood issues: employment, growth of informal sector — causes, informalisation and casualisation of work.

Informal sector: Composition - Gender, Caste, Age, Issues and recent developments: sub-contracting, etc., Implications on Livelihood, Women and Children Social Impacts — vulnerability, problems in access to Services - Health, Education, Food Security, Social Welfare.

Welfare programmes, and Legislations for informal sector. Institutional Mechanisms (Centre and State)

Module IV: Urban Community Development (12 Hours)

Concept, principles and approaches, Policies and programmes Urban Planning

Urban Social safety nets — Critical overview of safety nets and urban development programmes- national and state. Social Work Interventions in urban communities, Challenges in working with urban communities

Module V: Urban Governance (12 Hours)

History of Urban Local Self Government in India



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Types of Urban Local Self Government in India- Municipal Corporation, Municipal Council/Nagar Palika, Sources of Revenue, Structure, powers and functions at each level.

Committees and their functions, Ward Committees and citizen participation

74th Constitutional Amendment- Review of content and implementation, Role of Urban LSG bodies in Urban Development, Women’s participation; participation of marginalized groups Challenges in developing partnerships between elected bodies, bureaucracy and civil society.

References:

1. Batnagar, K.K., Gadeock, K.K. (Ed.): Urban Development and Administration, AalekhPublishers, Jaipur, 2007
2. Mohan, Sudha, Urban Development New Localism, Rawat Piublications, New Delhi, 2005.
3. Sivaramakrishnan, K. C. Kundri, Amitabh, Singh B. N.: Handbook of Urbanization in India:An Analysis of Trends and Processes Oxford University Press, 2005
4. Thtidipara, Z. Jacob, Urban Community Development (2nd Ed), Rawat Publications, New Delhi,2007
5. Das, Kumar Amiya, Urban Planning in India, Rawat Publications, New Delhi, 2007
6. Ali, Sabir (Ed), Dimensions of Urban Poverty, Rawat Publications, New Delhi, 2006
7. Batnagar, K.K., Gadeock, K.K. (Ed.): Urban Development and Administration, AalekhPublishers, Jaiptr, 2007
8. Mohan, Sudha, Urban Development New Localism, Rawat Piublications, New Delhi, 2005



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Social Work with Vulnerable groups

SOW4C15: Social Work with Vulnerable groups

Module I: Understanding key terms (14 hour)

Social exclusion, Vulnerability-Multiple vulnerability,, at risk group, socio- economic disadvantage, stigmatization

Children: analytical understanding of the prevailing realities, causes and precipitating factors of vulnerability, needs and problems of these children, child right and its deprivation.

Categories of vulnerable children, with emphasis on the girl child, destitute children, children from broken families, child labour, street children, children with disability, sexually abused children, children facing stigmatization, Children affected by natural calamities, disasters, domestic violence

National policies and programmes for children: Education, health, nutrition and protection. National and international agencies working with children. Institutional and non-institutional services for children.

National interventions and initiatives in child protection and child rights.

Scope of social work interventions and the role of the social worker in helping vulnerable children

Module II: Women (12 hours)

Major issues and concern of women, gender issues, issues of representation and participation, and reproductive health

A gender analysis of poverty, health, education and labour. Vulnerable women- adolescent girls, victims of violence and harassment, women having mental illness, Non-heterosexual women Homeless Women, Women in Commercial sex work, women with HIV/AIDS, Female offenders, older women, women with disabilities and Female substance users.

Policies and welfare programmes for Women. Role and functions of social work in working with



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vulnerable and marginalized women.

Module III: Elderly (12 hours)

Elderly: Issues and concerns of the elderly: Work, retirement, social security, housing; physical and mental health, disability, terminal illness and death of spouse; loneliness and alienation; feminization of ageing, domestic violence and abuse; dependency and family care; destitution; Risk assessment.

Policies and programmes for elderly in India, Welfare schemes for elderly. Role of Govt. and NGOs in the development of services for elderly.

Social work practice for enabling active ageing and enhancing quality of life: education for preparation of new roles and activities; for physical safety, financial security; retirement planning; individual and family counselling for adjustment and emotional wellbeing; bereavement counselling; mediating for enabling the elderly to receive their entitlements.

Module IV: Differently abled (12 hours)

Disability, Persons with Disability and their Rehabilitation Contexts — Understanding different categories of disability, causes, classification, assessment, consequences/impact of disability on individual's growth and functioning

Needs and problems of person with disability issues related to activities of daily living, education, sexuality, integration, employment and interpersonal relationships.

Role of the social worker, team work with professionals working in the field of disability and rehabilitation. Policies and programmes for people with disability in India.

Module V: Schedule caste and scheduled tribes (10 hours)

Historical background of backwardness, oppression and oppressive practices in a caste society, problems of Dalits and Tribals, socio political and religious movements; Policies and welfare programmes for SC/ST. Social Work with SC/ST- Approaches, and strategies.



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References:

1. AFFILIA: Journal of Women and Social Work
2. Bhumali,A. (2009). Rights of disabled women and children in India. New Delhi: Serialspublications.
3. Desai, M. and Siva, R. (2000). Gerontological Social Work in India: Some Issues and Perspectives. Delhi:B.R. Publishing.
4. Gandhi, E.A &Vijayanchali, S.S (2012). Marginalised groups. New Delhi: APH Publishing Corporation.
5. Gitterman, A. (2014). Handbook of Social Work Practice with Vulnerable and Resilient Populations. New York: Columbia University Press.
 - a. Karade, J. (2008). Development of Scheduled Castes and Scheduled Tribes in India. UK: CambridgeScholars Publishing.
6. Naqi M (2005) Social work for weaker sections. Anmol Publications Pvt.Ltd.
7. Mukherjee, M. (2006): Problems of Disabled People.
8. Parke, I.& Penhale, B (2007). Working with Vulnerable Adults (The Social Work Skills Series)

Social Work Practice with Families

SOW4E104 Social Work Practice with Families

Module I: Concepts (11 Hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Concept of family, Definition Marriage and Family, Types of family, Functions of family, Qualities of successful families, Trends in Marriage & Family. Emerging family problems
Overview of Conceptual frameworks for Understanding Marriage and Family:
Family Systems Perspective: Family system, Key assumptions about family systems

Module II: Family Developmental Perspective (6 Hours)

Family life cycle — Developmental stages of family, Variations affecting Family Life Cycles: Separation and divorce, Death of a parent, Single parenting, Step parenting, blended families, Cultural variation
Variations affecting the life cycle

Module III: Assessment of Family (13 Hours)

Family Assessment Tools: Genogram, Ecomap, Mc Master Model. Assessing family functioning using Family Categories Schema, Process Model of Family Functioning, Assessment of child development, Assessment of parent — child relationship, Assessing parenting skills.

Module IV: Family Social Work (14 Hours)

Family social work — Concept & Definition, historical background - Assumptions - Principles Family Social Work, Family Counselling and Family Therapy — similarities and differences.

Practice of Family social Work: Scheduling Family meetings, building relationship with clients, Techniques of interviewing families: Attentive listening, Formulating questions, Different phases of Family Social Work - Beginning phase - Assessment phase - Goal Setting and Contacting - Intervention phase — Promoting behaviour change, Termination Phase, Evaluating outcome, **Gender sensitive practice**, culturally sensitive practice

Module V: Practice of Family Social Work (16 Hours)

Scope and practice of social work in



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Family Counselling Centers- Premarital, Marriage and Family Counseling
2. Family Courts
3. Adoption and Foster Care Agencies
4. Family Violence

Existing policies, programmes, legislations, organizations in the field of family welfare and development. Family Life Education-Concept, philosophy, goals and significance.

References:

1. Carter, Betty (2004). Expanded family life cycle: individual, family and social perspectives. New York: Pearson Education
2. Collins, D. Jordan, Cathleen, Coleman, Heather (1999). An Introduction to Family Social Work. Illinois: F. E. Peacock Publishers
3. Olson, D. H., & De Frain, J. (2000). Marriage and the family: Diversity and strengths. Mayfield Publishing Co.
4. Barker, P., & Chang, J. (2013). Basic family therapy. John Wiley & Sons



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Environmental Studies and Disaster Management

SOW4 E2 03 Environmental Studies and Disaster Management

Module I: Basic Concepts (12 Hours)

Environment and Ecology. Basic concepts: Ecosystems, Biotic and abiotic factors, climatic factors, foodchain, food web. Bio Geo Chemical cycles. The interrelatedness of living organisms and natural resources.

Environmental Ethics: Gaia Theory, Ecosophy, and Deep Ecology, Environmentalism Biodiversity, Natural Resources and Livelihoods, Sustainable Development

Module II: Conservation and Management of Resources (12 Hours)

Natural Resource Management - Policy and approaches (e.g., Community-based natural resource management, integrated natural resource management), Role of rural institutions and other mechanisms in the protection of Natural Resources (e.g., Pani Panchayats, Vana Samrakshana Samiti, Diversification of livelihoods)

Issues related to Natural Resources- Rights, Indigenous knowledge systems and Indigenous Communities, Food Security, Forestry and Land Use

Concept of appropriate technology. Appropriate technology models in housing, watershed, energy, cottage industries, agriculture.

Gender and Environment: The relationship between Men, Women and Environment, Eco- feminism.

Module III: Environment problems (12 Hours)

Climate change and global warming, depletion of the ozone layer, desertification, land degradation, extinction of wildlife and loss of natural habitat, deforestation, biodiversity depletion, Nuclear wastes and radiation issues, waste management, pollution, energy crisis, disasters.



CRITERION	I	Curricular Aspects
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Impact of development initiatives, war and terrorism.

Environment issues specific to Kerala- Threats to wetlands and Western Chats, sand mining, quarrying, solid waste management. Mitigation Strategies

Module IV: Responses to environment Issues (12 Hours)

Environmental Movements: History of International Environmental Movements, Cirassroots Environmental Movements in India

International Conferences and Environmental Agreements.

Environmental Policy and Politics: An Overview of policies such as liberalization and globalization

Environment and International Organisations: United Nations, the World Bank and the World Trade Organization. Impact of environment policies on developing nations.

Social Work and environment — Green social work, Interventions — crisis intervention, advocacy, monitoring and enforcement of policy and legal instruments, education, consultation on sustainable development initiatives and appropriate technology.

Module V: Disaster Management (12 Hours)

Disaster: Definition, Natural and Human made disasters; multiple causes and effects; Development and Disaster. Disaster Management: Goals, Disaster management cycle —Prevention, Mitigation, preparedness, Rehabilitation, Reconstruction. Role of social workers in different stages. Disaster Management Policy, Disaster Management Act 2005, Role of government and voluntary organizations.

References:

1. Saxena, H.M.: Environmental Studies, Rawat Publications. New Delhi, 2006.
2. Pawar, S.N, Patil, R.B and Salunkhe, S.A (Eds) : Environmental Movements in India. Strategies and Practice. Rawat Publications. New Delhi, 2005



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Carson, Rachel: Silent Spring, Penguin books, 1962
4. BiSOWal, Tapan: Human rights, Gender and Environment
5. Ariyabandrt, M. M: Bringing together Disaster and Development — Concepts and Practice, SomeExperiences from South Asia.”(2003)
6. Pradeep Sahni and Madhavi Malalgoda Ariyabandti (Eds.); Disaster Risk Reduction in South Asia. New Delhi: Prentice-Hall of India
7. Dominelli, Lena: Green Social Work: From Environmental Crises to Environmental Justice, Polity Publishers 2012

Social Work Practice and Gender

SOW4E204 Social Work Practice and Gender

Module I: Basic concepts (10 Hours)

Concepts- gender, gender studies, gender identity, gender role stereotyping, gender division of labour,gender discrimination, patriarchy, gender equality and equity.

Overview of feminist theories — Liberal feminism, Radical Feminism, Black feminism, postmodernfeminism, Eco feminism. Women’s Movements

Module II: Status of women (12 Hours)

Health- life expectancy, maternal mortality, nutritional status, incidence of diseases, mental health issues

Education — literacy rate, representation in higher education,

Work and Income— work participation, wages, ownership of property and assets

Political participation: Women in governance: an assessment of the Panchayati

Raj experience,Representation in media, Gender and the Indian Legal System: Gender and personal law.



CRITERION	I	Curricular Aspects
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Factors affecting the Status of Women in India

Discrepancies and gaps in the status with respect to health, education, employment and participation

Module III: Gender Based violence (12 Hours)

Violence against Women—Theoretical perspectives, Causes — cultural, economic, legal and political factors. Continuum of Violence. Types - Rape, Pornography, Child Sexual Abuse, Domestic Violence and Violence at Workplace. Trafficking, forced prostitution, Military rape and sexual abuse, traditional practices like genital mutilation. Violation of Reproductive Rights, Gender issues in Population Control and Contraception, Sex-selective abortions, female infanticide, surrogacy.

Legal remedies and Social Welfare Services available to Women Facing

Violence. **Module IV: Gender and Development (12 Hours)**

Human Development Index, Gender Development Index, Gender Empowerment Measure, Approaches to development-- Women in Development (WID), Women and Development (WAD), Gender and Development (GAD)

Gender Analysis Frameworks and gender mainstreaming; Gender blind, neutral and redistributive policies; Welfare, Efficiency and Empowerment approaches to Gender; Strategic and practical gender needs/interests; International initiatives -world conferences, women’s decade, CEDAW. Indian initiatives — the ‘Towards Equality’ Report, National Perspective Plan for women, National Policy for the Empowerment of Women- 2001, National and State women’s Commissions, Nirbhaya, Women Development Corporation

Module V: Social Work with women (14 Hours)

Feminist social work theory and practice; Applications of liberal, radical, socialist, cultural, postmodern and global feminism to social work practice;

Feminist theory and practice: Implications for working with men and other disadvantaged groups.



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Interventions for women from feminist frame works. Interventions with tender Based Violence, Women and Mental Health, sexual minorities, Homeless Women, widows, elderly women, women in commercial sex work and women with HIV/AIDS, female offenders, women in unorganized labour sector and women with disabilities

Gender Aware therapy, Feminist counseling, building collectives, education, advocacy, challenging sex role stereotypes, challenging patriarchal norms, assertiveness training, strategies to encourage a sense of empowerment. Challenges in working with women

Referenes:

1. Dominelli, Lena (2007), Women and Community Action Rawat Publications Jaipur
2. John, Mary E., (2008), Women’s Studies in India a Reader Penguin Books, New Delhi
3. Kamala Bhasin, (2003), Understanding Gender, Women Unlimited, New Delhi
4. Lee, Janet and Siisan M. Shaw. 2011. Women Worldwide: Transnational feministperspectives on women. New York: McGraw Hill.
5. Nalini Visvanathan (Ed.), (2006) The Women, Gender and Development Reader, Z tiban, NewDelhi,
6. Sharma,Kumud & Sujaya C. P., (2011) Towards Equality: Report of the Committee on theStatus of Women in India. Pearson
7. White, Vicky (2006) The State of Feminist Social work, Routledge London
8. Peterson, K. Jean and Lieberman, A. Alice (Eds) (2001) Building on Women’s Strengths- Asocial Work Agenda for the Twenty First Century. Roiitledge New York
9. Towards Equality Report, Government. of India, 1975



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Introduction to Hospitality Industry

BSH/C1B01 Introduction to Hospitality Industry

Module	Topic	Content
1	Introduction to the Hospitality industry	<ul style="list-style-type: none"> a. The origin of hospitality b. History of travel -in India and international –early times, Persian, Macedonial times, Mayurian empire ,the Mugal Empire, The Muslim Empire, English Raj, Post Independence c. Hospitality –Guest relation, customer satisfaction d. Types of hospitality e. Hospitality ethics and standards f. Traits of hospitality employees g. Evolution and growth of hotel industry in India
2	History of Hotels ,Resorts and Motels	<ul style="list-style-type: none"> a. Inns of early times b. History of hotels in America c. History of motels and it’s features d. Advent of hotel chains .
3	Types of hotels, Hotel Organization And Job Description	<ul style="list-style-type: none"> a. Small, medium and Large hotels b. Revenue Departments c. Non revenue departments d. Minor revenue departments e. Uniformed services of hotel f. Organisation chart g. Job description and job specification of front office employees
4	Customer service and Understanding guest service	<ul style="list-style-type: none"> a. What is customer service b. Why is customer service is important c. Who is the customer d. Creating excellent mindset e. Customer relationship management f. Difference between service and physical products



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5	Areas of Hospitality industry	a. Basis of classification of hotels: resorts, commercial hotels, floating hotels, motels, casino hotels, time share, condominiums, boutique hotels and supplementary accommodations b. Air lines c. Railway d. Limousines, luxury Cruise lines, e. Fast food restaurants, Institutional catering, Theme park, welfare catering and outdoor catering.
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REFERENCE BOOK

Sl.No	Book Name	Author
1	Hospitality reception and front office procedures and systems	Dr.JagmohanNegi
2	Introduction to tourism &hospitality industry	Sudhir Andrews
3	Hotel front office operations and management	Jatashankar. R.Tewari
4	Front office management	S.k.Bhatnagar
5	Training manual for front office operations	Sudhir Andrews

Accommodation Operations

BSH2B02 Accommodation Operations

Module	Topic	Content
1	Housekeeping	a. Introduction – What is Housekeeping? b. Classifications of hotels. c. Importance of housekeeping in hospitality industry. d. Responsibilities of housekeeping Department. e. Personal attributes of housekeeping staff.



CRITERION	I	Curricular Aspects
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2	Organizational Framework of the department	<ul style="list-style-type: none"> a. Organizational structure of housekeeping department. (small, medium, large) b. Job description, job specification, job list, job breakdown and job procedures. c. Duties and responsibilities of housekeeping personnel. (EHK, Deputy Housekeeper, Desk control supervisor, Room and public area supervisor, guest room and public area attendants) d. Types of rooms and room status. e. Coordination with other department.
3	Cleaning Procedures & Types of cleaning	<ul style="list-style-type: none"> a. Principles of cleaning, cleaning agents, cleaning equipment's. b. Frequency of cleaning. c. Spring cleaning d. Sequence of guest room cleaning- entering the guest room, removal of soiled linen, making the bed, cleaning the bathroom, replenish the supplies servicing VIPs room. e. Second service, turndown service, guest floor practices, Room report.
4	Housekeeping Procedures	<ul style="list-style-type: none"> a. Daily routine system in housekeeping. b. Housekeeping control desk, forms formats and registers maintained in control desk. c. Types of Keys and key handling. d. Lost and found procedures. e. First Aid & Fire safety procedures
5	Public Area Cleaning	<ul style="list-style-type: none"> a. Entrance, lobbies, front desk, b. Elevators, stair case, guest corridors, c. Public rest rooms, d. Banquet halls, restaurants e. Leisure areas.

REFERENCE BOOKS

Sl.No	Book Name	Author
1	Hotel Housekeeping Operations & Management	G.Raghubalan, SmarteeRaghubalan
2	Housekeeping Theory & Practices	Dr.JagmohanNegi



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3	Professional Management of Housekeeping Operations	Robert.J.Martin
4	Hotel Housekeeping	Milani Singh
5	Hotel Housekeeping Training Manuel	Sudhir Andrews
6	Accommodation Operation Management	S.K .Kaushal, S N Gautham

Food and Beverage Production –I

BSH3B03 Food and Beverage Production –I

Module	Topic	Content
1	INTRODUCTION TO COOKERY	Levels of skills and Experience- Attitudes and Behavior in the Kitchen- Personal Hygiene- Safety Procedure in Handling Equipment-Aims and objectives of cooking food-Variou textures- Basic Culinary terms. HIERARCHY AND DEPARTMENT STAFFING; Classical Brigade- Modern staffing in various category hotels-Role of Executive Chef-Duties &Responsibilities of various chef-Co-operation with other Departments. KITCHEN ORGANIZATION & LAY OUT; General layout of kitchen in various organization- Layout of Receiving Areas- Layout of storage Area- Layout of service and wash up- Various Fuels used- Advantages & Disadvantages.
2	BASIC PRINCIPLES OF FOOD PRODUCTION;	Introduction, Classification of vegetables- Effects of heat on vegetables- Cuts of vegetables- Classification of fruits- Uses of Fruit in Cookery- Salads & Salad dressing stocks- Definition of Stock- Types of Stocks- Preparation of stock- Storage of Stocks - Uses of Stocks –Soups -Classification of soups with examples- Basic recipes- Consommés- Garnishes and accompaniment for Soups - Classification of Sauces- Recipes for mother Sauces- Derivatives.



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3	MEAT, RICE & PULSES	Meat; Introduction- Cuts of Beef/Veal- Cuts of Lamb/Mutton- Cuts of Pork - Variety meats (Offal). Fish; Classification of fish with examples - Cuts of fish - Selection fish and & shellfish- Cooking of fish. Egg; Introduction of Egg Cookery- Structure of an egg- Selection of egg- Uses of egg in Cookery. Rice; Introduction - Classification and Identification - Cooking of rice, cereals & pulses - Varieties of rice & other cereals.
4	METHODS OF COOKING FOOD;	Roasting, Grilling, Frying, Baking, Broiling, Poaching, Boiling. BASIC COMMODITIES; Flour; Types of wheat-Types of flour -. Uses of flour in food production-Shortening- Role of shortening- Varieties of shortenings-Advantages & Disadvantages of using different shortenings-Fats & Oil - Types, varieties -Raising agents -Classification of raising agent- Role of raising agents. Sugar; Importance of sugar- Types of sugar- Cooking of sugar- (various stages)- Uses of sugar.
5	BEVERAGES, MILK & MILK PRODUCTS	Tea; Types of tea available- Preparing tea for consumption-Popular brand. Coffee; Types of coffee- Preparing coffee-Varieties of coffee- blends Chocolate- Manufacture of chocolates- Types of chocolates - Tempering of chocolates. Milk; Pasteurization, Homogenization, Types of milk. e.g. skimmed condensed.- Nutritive value. Cream; Processing of cream - Types of cream- Butter - Processing of butter- Types of butter. Cheese; Processing of cheese- Types of cheese-Classification of cheese- Cooking of cheese- Uses of cheese. USES OF HERBS AND WINES IN COOKERY.

REFERENCE BOOKS

Sl.No	Book Name	Author& Publisher
1	Practical Cookery,.	Victor Ceserani & Ronald Kinton, ELBS



CRITERION	I	Curricular Aspects
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2	Theory of Catering,	Victor Ceserani& Ronald Kinton, ELBS
3	Theory of Catering,	Mrs. K.Arora, FrankBrothers
4	Modern Cookeryfor Teaching & Trade	Vol. I, Ms. ThangamPhilip, Orient Longman
5	Herrings Dictionaryof Classical& Modern Cookery,	Walter Bickel
6	Chef Manual of Kitchen Management,	Fuller, John

Food and beverage Service-I

BSH3B04 Food and beverage Service-I

Module	Topic	Content
1	Introduction to catering	Introduction to the Hotel Industry and growth of the hotel Industry in India Catering establishments: Definition and structure Role of catering establishment in the travel/tourism industry Classification of the catering industry



CRITERION	I	Curricular Aspects
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2	Department organization and staffing	<p>Organization of Food and Beverage department of hotel Principal staff of various types of F&B operations, duties and responsibilities French terms related to F&B staff. Inter-departmental relationships (Within F&B and other department)</p> <p>Attributes of a waiter- Personal hygiene, punctuality, personality, attitude towards guests, appearance, salesmanship and sense of urgency</p> <p>Types of restaurants: overview and key characteristics - coffee shop, continental restaurants, specialty restaurants, pubs, night clubs, discotheques, snack and milk bar.</p>
3	Operating equipments	<p>Classification of crockery, cutlery, glassware, hollowware, flatware and special equipments Restaurant linen and furniture Dummy waiter- arrangement and uses during services. Ancillary departments: Pantry, still room, silver room, wash-up and hot-plate.</p>
4	Menu	<p>Origin of menu, Objectives of Menu Planning, Types of menu- table d'hôte menu, a la carte menu (Cover and layout) French classical menu with examples Food and their usual accompaniments Breakfast: Types, menu for each type, terms used in the service of continental breakfast Cover laying for continental and English breakfast. Order taking procedures: In-person, telephone and door hangers.</p>



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5	Types of service	<p>Different styles of service, advantages and disadvantages. Restaurant service: Misen scene, Misen place. Points to be remembered while laying a table, Do's and don'ts in a restaurant Sequence of service Floor / Room service: Meaning, Full & Partial room service, Breakfast service in room, tray & trolley set-up for room service Lounge service: Meaning, organization of lounge service. Tea service: Afternoon tea and high tea, order of service. Banquets and buffets – Types and layout.</p>
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REFERENCE BOOKS

Sl.No	Book Name	Author& Publisher
1	Food and Beverage Service	Dennis Lillicarp, Hodder and Stoughton Educational
2	Food and Beverage Service	John Cousins, Hodder and Stoughton Educational
3	Food and Beverage Service	Sudhir Andrew , Tata McGraw Hill Education
4	Food and Beverage Service	JagmohanNegi, Frank Brothers & Co .Ltd, Delhi
5	Food and Beverage Service	Bobby George and Sandeep Bhattacharya, Jaico Publishing House, Delhi



CRITERION	I	Curricular Aspects
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Food And Beverage Service -I(Practical)

BSH3B04 (P) Food And Beverage Service -I(Practical)

Module	Topic	Content
1	Food and Beverage service areas	<p>Induction and familiarization of F & B service areas Ancillary F & B service areas –Induction and profile Familiarization of F& B Service equipment-cutlery, crockery, glassware, flatware, hollowware, linen and miscellaneous equipments</p> <p>Care & Maintenance of F&B Service equipment</p> <p>Cleaning / polishing/wiping /storing of F & B service equipments-cutlery, crockery and glassware.</p>
2	Basic technical skill	<p>Waiter’s tool kit Arrangement of sideboard</p> <p>Handling/ storing cutlery, crockery, glassware, flatware, hollowware</p> <p>Manipulating service spoon and fork for serving various courses Laying and relaying of table cloth</p> <p>Serviette folds</p>
3	Menu	<p>Practice of simple menu compilation.</p> <p>Types of menu -Table lay up for different menu - A La Carte, Table d’hôte,</p> <p>French classical Menu</p> <p>Points to be remembered while laying a table for a menu</p>



CRITERION	I	Curricular Aspects
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4	Food and Beverage service	<p>Restaurant service -Organizing Mise-en-scene,Organizing Mise- en-Place. Opening, Operating & Closing duties</p> <p>Restaurant vocabulary – English and French</p> <p>Different forms of service in a restaurant- Russian, American, French, Silver and English.</p> <p>Service of water Carrying a Tray /Salver Carrying glasses</p> <p>Service of various forms of a meal courses: Hors d’ oeuvres, Potege, Poisson, Entrée, Releve (main), Sorbet, Roti, Legumen, Entrement, Savoury, Desserts and Cafe.</p> <p>Clearing soiled plates/Clearing of a meal (course by course)Sequence of service-Receiving and seating of guests, presenting the menu, taking orders, serving courses, bill presentation and seeing off the guest.</p>
5	Breakfast service	<p>Breakfast –Types</p> <p>Breakfast Menu (English, American Continental, Indian, buffet)</p> <p>Breakfast table setting - Continental breakfast cover and tray set up.English breakfast cover and tray set up. Buffet</p> <p>Service of non – alcoholic drinks, tea and coffee</p>

REFERENCE BOOKS

Sl.No	Book Name	Author& Publisher
1	Food and Beverage Service	Dennis Lillicarp, Hodder and Stoughton Educational
2	Food and Beverage Service	John Cousins, Hodder and Stoughton Educational
3	Food and Beverage Service	Sudhir Andrew , Tata McGraw Hill Education
4	Food and Beverage Service	JagmohanNegi, Frank Brothers & Co .Ltd, Delhi
5	Food and Beverage Service	Bobby George and Sandeep Bhattacharya, Jaico Publishing House,



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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		Delhi
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Food & Beverage Production –I1

BSH4B06 Food & Beverage Production –I1

Module	Topic	Content
1	INDIAN COOKERY	Introduction to Indian foods . CONDIMENTS AND SPICES ; Spices used in Indian Cookery - Role of spices in Indian cookery - Indian equivalent of spices (names). BASIC MASALAS ; Blending of spices and concept of ‘masala’- Different masalas used in Indian Cookery - Wet masalas - Dry masalas - Composition of different masalas - Varieties of masalas available in regional areas - Special
		masala blends. THICKENING AGENTS ; Role of thickening agents in Indian cuisine - Types of thickening agents
2	QUANTITY FOOD PRODUCTION	EQUIPMENT- Quality of equipment used - Specification of equipment - Care & maintenance of equipment - Heat and cold generating equipment - Modern developments in equipment manufacturing.
3	MENU PLANNING	Basic menu planning – recapitulation, Special emphasis on quantity food production, planning of menus for various categories, such as; School/college students, industrial Workers Hospitals, canteens, outdoor, party’s theme dinners, Transport/mobile catering, Parameters for quantity food menu planning. INDENTING : Principles of indenting - Quantities/portions for bulk production - Translation of recipes



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

		for indenting - Practical difficulties involved in indenting.
4	INTERNATIONAL CUISINE	<p>British, Middle East, Spanish,</p> <p>French, Italian, Oriental And Mexican. SANDWICHES: Parts, Filling, Spreads And Garnishes, Types, Making And Storing. CHARCUTIERE; - Sausages</p> <ul style="list-style-type: none"> • Forcemeats - - Marinades, Cures, Brines- Bacon, Ham, Gammon- Galantines - Pates And Terrines - Mousses And Mousselines - ChaudFroid - Aspic Jelly - Non Edible Displays. APPETIZERS AND GARNISHES; - Classification • Examples, Different Garnishes.
5	BAKERY	<p>Short Crust – Laminated – Choux- Hot Water/Rough Puff - Recipes and methods of preparation - Care to be taken while preparing pastry - Role of each ingredient - Temperature of baking pastry. BREADS; Principles of bread making - Simple yeast breads - Role of each ingredient in bread making - Baking temperature and its importance. PASTRY CREAM; Basic pastry creams. Uses in confectionery. ICING AND TOPPING; FORZEN DESSERTS</p>

REFERENCE BOOKS

Sl.No	Book Name	Author& Publisher
1	Practical Cookery,.	Victor Ceserani & Ronald Kinton, ELBS
2	Theory of Catering,	Victor Ceserani& Ronald Kinton, ELBS
3	Theory of Catering,	Mrs. K.Arora, FrankBrothers
4	Modern Cookeryfor Teaching & Trade	Vol. I, Ms. ThangamPhilip, Orient Longman



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5	Herrings Dictionary of Classical & Modern Cookery,	Walter Bickel
6	Chef Manual of Kitchen Management,	Fuller, John

Accommodation Management

BSH5B08 Accommodation Management

Module	Topic	Content
1	Linen and Uniform room management	Layout, responsibilities of linen room supervisor, and attendant. Type's storage and exchange of linen, par stock and linen control. Purchase of Linen. Issue and exchange procedures of linen. Advantage of providing staff uniforms.
2	Laundry Operations	a. Types of laundry and laundry equipment's. Wash cycle Dry cleaning Stain removal. Layout of laundry, on premises laundry – location & planning.
3	Interior design & flower arrangements	Objectives types and principals of design. Types / styles of flower arrangements. Equipment's and types of flower used for the arrangements Flower arrangements at various locations. Care and Conditioning of flowers.
4	Housekeeping supervision	Importance of supervision. Check list for guest room inspection. Types of guest complains Handling of guest complaints Guest floor reportable and guest floor rules.



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5	Contracts and outsourcing in Housekeeping	Contracts –contract services in housekeeping, hiring contract providers, Contract specification, pricing contract. Out sourcing Changing trends in housekeeping Pest control – types and methods Waste management- collection segregation and disposal
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Reference Books:

Sl.No	Book Name	Author
1	Hotel Housekeeping Operations & Management	G.Raghubalan,SmarteeRaghubalan
2	Housekeeping Theory & Practices	Dr.JagmohanNegi
3	Professional Management of Housekeeping Operations	Robert.J.Martin
4	Hotel Housekeeping	Milani Singh
5	Hotel Housekeeping Training Manuel	Sudhir Andrews
6	Accommodation Operation Management	S.K .Kaushal, S N Gautham



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Rooms Division Management

BSH 5B09 Rooms Division Management

Module	Topic	Content
1	Computer applications in front office	<ul style="list-style-type: none"> f. Property Management system g. Different types of Modules in PMS h. Different property management system i. Interface j. Self service terminal and information kiosk
2	Yield Management	<ul style="list-style-type: none"> f. Yield Management and forecasting g. Measuring yield in the industry h. Yield management in the hotel industry i. Elements of yield management j. Benefits of yield management, yield management strategies, challenges or problems in yield management, Measuring yield, forecasting, benefits of forecasting, Data required for forecasting, record required for forecasting room availability, yield management prospects
3	Evaluating Hotel performance	<ul style="list-style-type: none"> f. Methods of measuring hotel performance g. Occupancy ratio h. Average daily rate and average room rate per guest i. Revenue per available room j. Market share index and evaluation of hotels by guest
4	Overview of soft skills for hospitality	<ul style="list-style-type: none"> f. Introduction g. Job opportunities and their skill requirement h. Definition of Hard and soft skills i. Role of National skill development corporation j. Soft skill requirements for the service industry and teaching soft skills



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5	Total Quality Management	<ul style="list-style-type: none"> f. Guests perception of quality g. Introduction to total Quality Management h. Practices in total quality management i. Japanese 5 s practice j. Business process Re-engineering, Quality control circles,kaizen,Benchmarking,Benefits of total qualitymanagement
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REFERENCE BOOKS

Sl.No	Book Name	Author
1	Hotel front office operations and management	Jatashankar. R.Tewari
2	Hospitality reception and front office procedures and systems	Dr.JagmohanNegi
3	Front office management	S.k.Bhatnagar
4	Managing front office operations	Michael. L.kasavana
5	Soft skills for hospitality	Amitabh Devendra



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Industrial Exposure Training and Report

BSH6B11 Industrial Exposure Training and Report

Industrial Exposure Training is an integral part of the curriculum. Student has to undergo industrial training minimum 22 weeks at a single stretch. They will be awarded 100 marks (80 marks external evaluation and 20 marks internal evaluation) for the industrial training & report and for viva voce.

- 1) For award of 100 marks of IET would be on the basis of feed-back from the industry in a prescribed Performance Appraisal Form (PAF). It will be the student's responsibility to get this feed-back/assessment form completed from all the four departments of the hotel for submission to the institute at the end of Industrial Training.
- 2) Responsibilities of institute, hotel, the student/trainee with aims & objectives have been prescribed for adherence.
- 3) Once the student has been selected / deputed for Industrial Training by the Institute, he/she shall not be permitted to undergo it elsewhere. In case students make direct arrangements with the hotel for Industrial Training, these will necessarily have to be approved by the institute. Students selected through campus interviews will not seek Industrial Training on their own.

INDUSTRIAL EXPOSURE TRAINING

Objective of industrial Exposure Training is to provide to students the feel of the actual working environment and to gain practical knowledge and skills, which in turn will motivate, develop and build their confidence. Industrial Training is also expected to provide the students the basis to identify their key operational area of interest.

1.1.6 RESPONSIBILITIES OF THE TRAINEE

1. Should be punctual
2. Should maintain the training logbook up-to date
3. Should be attentive and careful while doing work
4. Should be keen to learn to learn and maintain high standards and quality of work
5. Should interact positively with the hotel staff.
6. Should be honest and loyal to the hotel and towards their training.
7. Should get their appraisals signed regularly from the HODs or training manager.



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8. Gain maximum from the exposure given, to get maximum practical knowledge and skills.
9. Should attend the training review sessions / classes regularly
10. Should be prepared for the arduous working condition and should face them positively
11. Should adhere to the prescribed training schedule.
12. Should take the initiative to do the work as training is the only time where you can get maximum exposure.
13. Should on completion of industrial Training, hand over all the reports, appraisal, logbook and completion certificate to the institute.

RESPONSIBILITIES OF THE INSTITUTE

1. Should give proper briefing to students prior to the industrial training
2. Should make the students aware of the industry environment and expectations.
3. Should notify the details of training schedule to all the students.
4. Should coordinate (emergencies) with the hotel especially with the training manager
5. Should visit the hotel wherever possible, to check on the trainees
6. Should sort out any problem between the trainees and the hotel
7. Should take proper feedback from the students after the training
8. Should brief the students about appraisals, attendance, marks, logbook and training report.
9. Should ensure trainees procure training completion certificate from the hotel before joining institute.

RESPONSIBILITIES OF THE HOTEL

First exposure: A young trainee's first industry exposure is likely to be the most influential in that person's career. If the managers / supervisors are unable or unwilling to develop the skills young trainees need to perform effectively, the latter will set lower standards than they are capable of achieving, their self-images will be impaired, and they will develop negative attitudes towards training, industry, and in all probability - their own careers in the industry.

Hotels:

1. Should give proper briefing session! Orientation / induction prior to commencement of training.
2. Should make a standardized training module for all trainees.
3. Should strictly follow the structured training schedule.
4. Should ensure cordial working conditions for the trainee.



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5. Should coordinate with the institute regarding training programme
6. Should be strict with the trainees regarding attendance during training
7. Should check with trainees regarding appraisals, training report, log boom, etc.
8. Should inform the institute about truant trainees
9. Should allow the students to interact with the guest
10. Should specify industrial training “Dos and Don’ts” for the trainee
11. Should ensure issues of completion certificate to trainees on the last day of training

travel And Tourism

BSH/C1C02travel And Tourism

Module I. Introduction to travel and tourism – meaning – nature – definitions –Tourism, Tourist, Visitor, Excursionist -purpose of travel- travelers and visitors-the industry definitions followed in India-**international tourism-domestic tourism-in bound tourism -out bound tourism-mass tourism -basic components of tourism-** elements of tourism-future of tourism- Characteristics of Tourism. History of travel and tourism – Role of Transportation in Tourism– Air, Rail, Road, Sea-Cruises-

Module II. Tourism planning and development-**Tourism Policy formation-Types of tourism Planning- Steps o tourism Planning-Role of international organizations Planning-Tourism Policy of India- Tourism in Kerala and its policy-** Participation of Public and private sector in Planning Economics of Tourism- Travel motivations- Job opportunities and employment generation- Govt. Revenue and foreign currency exchange- Economic growth based on tourists statistics- Economic benefit of tourism

Module III. Organizations in tourism – World Tourism Organization (WTO), International Air Transport Association (IATA), International Civil Aviation Organization (ICAO), Pacific Area Travel Association (PATA),



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India Convention Promotion Bureau (ICPB), Federation of Hotel and Restaurant Association of India (FHRAI), Travel Agent Association of India (TAAI), Universal Federation of Travel Agents Association (UFTAA).

Module IV. Travel Agency-concept, -role-functions-types of Travel agencies, Department of Travel agencies, Major activities-Income sources of travel agencies-Tour Operation-Meaning-definition-functions-types of tour operation overseas, domestic, specialist-main types of tourpackages-Independent, escorted, guided- FIT, GIT, inbound, outbound.- Travel formalities, types of passport, types of VISA, health related documents.

Module V- Tourism Products - meaning-definition-Types-India’s rich heritage- architectural heritage, forts, palaces, monuments-World heritage sites-Museums and Art Galleries- handicrafts- Culture and tradition-folklore, cuisine, costume, religions (Jainism, Islam, Hinduism, Christianity, Sikhism) Dance (Classical) and Music (instruments) - Fairs and festivals in India-Natural Products of India- Mountains, hill stations ,caves, Forests, Deserts, Waterfalls, Beaches, Backwaters, islands, farms and plantations - Wildlife resources of India – national parks and wildlife sanctuaries in India – bio reserve centers

Reference

1. Pran Seth: Successful tourism Management (Vol. 1 & 2)
2. A.K Bhatia: International Tourism
3. A.K Bhatia: Tourism Management & Marketing.
4. Christopher.J. Hollway; Longman ; The Business of Tourism
5. Cooper, Fletcher et al, (1993), Tourism Principles and Practices, Pitman.
6. P.N. Seth: Successful Tourism Development Vol. 1 and 2, Sterling Publishers
7. Page, S: Tourism Management: Routledge, London

Glenn. F. Ross - The Psychology of Tourism (1998), Hospitality Press, Victoria, Australia



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Event Management

BSH/C2C03 Event Management

Module I:- Events-Event management – definition – Broad classification of Events (types). Event planning, Five C’s of event management - Conceptualization, Costing, Canvassing, Customization, Carrying out- Role of events in promotion of tourism.

Module II:- MICE – Meeting – Incentives – Conference – Convention – Exhibition – Trade shows and fairs, Leisure Events, Sports Events – organizers – sponsorship – event management as a profession.

Module III:- Event Planning and organizing – Problem Solving and Crisis Management – Leadership and Participants Management – Managing People and Time – Site and Infrastructure Management.

Module IV: Event Marketing – Customer care – Marketing equipment and tools – Promotion, Media Relations and Publicity - Event Co-ordination - Visual and Electronic Communication – Event Presentation – Event Evaluation – Case Studies of events.

Module V: Travel Industry Fairs – Benefits of Fairs - ITB, WTM, BTF, TTW, FITUR, KTM, IITM, CII- Events, PATA Travel Mart- India Convention Promotion Bureau (ICPB).

Reference Books:

1. Event marketing and management – Sanjayasingh Gaur,
2. Event management and event tourism – Gelz,
3. Hospitality marketing and management – J M Mathews
4. Event and entertainment marketing, Avrighbarry (1994), Vikas, Delhi.
5. Event management, Bhatia A.K. (2001), Sterling Publishers, New delhi.
6. Event management in leisure and tourism, David C Watt (1998), Pearson, UK.
7. Event planning 2nd Edn. By Allen, Judy, 1952- the ultimate guide to successful meetings, corporate events, fund-raising galas, conferences,



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conventions, incentives and other special events / Judy Allen. ISBN 978-0-470-15574-5

Nutrition Hygiene and Sanitation

BSH/C 3C05 Nutrition Hygiene and Sanitation

Module 1: Definition of the terms Health, Nutrition and Nutrients. Importance of Food – (Physiological, Psychological and Social function of food). **NUTRIENTS:** Classification of nutrients. **CARBOHYDRATES:** Definition, Classification (mono, di and polysaccharides), Dietary Sources, Functions, Significance of dietary fiber (Prevention/treatment of diseases). **LIPIDS:** Definition, Classification : Saturated and unsaturated fats, Dietary Sources, Functions, Significance of Fatty acids (PUFAs, MUFAs, SFAs, EFA), Cholesterol – Dietary sources and the Concept of dietary and blood cholesterol.

Module 2: **PROTEINS:** Definition, Classification based upon amino acid composition, Dietary sources, Functions. Methods of improving quality of protein in food (special emphasis on Soya proteins and whey proteins). **VITAMINS:** Definition and Classification (water and fats soluble vitamins), Food Sources, function and significance of: Fat soluble vitamins (Vitamin A, D, E, K), Water soluble vitamins (Vitamin C, Thiamine, Riboflavin, Niacin, Cyanocobalamin Folic acid).

MINERALS: Definition and Classification (major and minor), Food Sources, functions and significance of: Calcium, Iron, Sodium, And Iodine & Fluorine. Effects of heat on starch, milk, meat, vegetables, role of fat in cooking, types of fat, spoilage of fat

Module 3: **BALANCED DIET:** Definition, Importance of balanced diet. RDA for various nutrients – age, gender, physiological state. **MENU PLANNING:** Planning of nutritionally balanced meals based upon the three food group system, Factors affecting meal planning, Critical evaluation of few meals served at the Institutes/Hotels based on the principle of meal planning. Calculation of nutritive value of dishes/meals. Food additives, Food



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adulteration, Food standards, Role of microorganisms in manufacturing bread, cheese, beverages etc. Egg white foams.

Module 4: MICRO-ORGANISMS IN FOOD: General characteristics of Micro-Organisms based on their occurrence and structure. Factors affecting their growth in food (intrinsic and extrinsic) Common food borne micro-organisms: Bacteria (spores/capsules), Fungi, Viruses, Parasites

Module 5: FOOD SPOILAGE & FOOD PRESERVATION: Types & Causes of spoilage, Sources of contamination, Basic principles of food preservation, Methods of preservation (High Temperature, Low Temperature, Drying, Preservatives & Irradiation). HYGIENE AND SANITATION IN FOOD SECTOR General Principles of Food Hygiene, GHP for commodities, equipment, work area and personnel Cleaning and disinfection (Methods and agents commonly used in the hospitality industry) HACCP (Basic Principle and implementation)

REFERENCE BOOKS

- 1) Food Science: B Srilakshmi
- 2) Food Science and Nutrition: Malathi
- 3) Nutrition Science: B Srilakshmi
- 4) Food and Nutrition: P K Jas.

Facility Planning

BSH/C 3C06 Facility Planning

Module –I

HOTEL DESIGN: Hotel design considerations, Systematic Layout Planning, Rules for allocation of space in a hotel.

Module-II

HOTEL CLASSIFICATION: Types of hotel, Guidelines for Approval of Hotel Projects and its classification, Classification of hotels including Heritage and Apartment Hotels



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Module -III

KITCHEN and RESTAURANT DESIGN: Designing and planning restaurant, Bar design, Physically layout of kitchen, Kitchen configuration and environmental conditions

Module-IV

PROJECT MANAGEMENT: Basic rules and procedure for network analysis, CPM & PERT, Comparison of CPM & PERT

Module V

ENERGY CONSERVATION PROGRAMME IN HOTEL INDUSTRY: Energy conservation, Conservation of energy in different hotel areas, Energy Audit

REFERENCE BOOKS:

- Systematic layout planning-Richard MutherCahners
- Hotels and resort planning by Fred Lawson
- Food service planning-layout and equipment-Lendall H Kotschevar, Margret E Tarell Hotel facility planning-Tarun Bansal

Hotel Laws

BSH/C 4C07 Hotel Laws

Module 1:

Indian Contract Act 1872 – Contract – Nature and Classification of Contracts – offer and acceptance – consideration – capacities of parties – free consent – coercion – undue influence misrepresentation- fraud – mistake – void agreements – discharge of contract – breach of contract and remedies- contingent contract - quasi contracts.

Module 2:

Special Contracts – Contract of Indemnity – meaning – nature – right of indemnity holder – and indemnifier – Contract of Guarantee- Meaning – nature - and features- surety and co- surety- rights and liabilities- discharge of surety from his liabilities.

Module 3:

Contract of Bailment And Pledge – rights and duties of bailer and bailee – pledger and pledge –pledge by non owner – Agency – duties and liabilities of agent and principal -



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termination of agency.

Module 4:

Sale of Goods Act, 1930 – Contract of sale of goods – Meaning – Essentials of contract of sale – Conditions and warranties- caveat emptor – sale by non owners – rules as to delivery of goods – auction sale - rights of unpaid seller.

Module 5:

Hotel laws-Shops & establishment act-Rights of Innkeeper & tenant, Various laws pertaining to hotel Industry-**The Consumer Protection Act, 1986 – Definition – consumer – complainant – goods – service – complaint – unfair trade practices – restrictive trade practices – rights and remedies for consumers -consumer protection council – consumer disputes redressal agencies.**

REFERENCE BOOKS :

HOTEL LAWS- AMITHABH DEVENDRA; OXFORD PUBLICATIONS. MERCANTILE LAW: M.C KUNHAL. MERCANTILE LAW: GARY AND CHAWLA. BUSINESS LAW : TULSIAN. BUSINESS LAW: GARY AND CHAWLA.

human Resource Management

BSH/C4C08 human Resource Management

Module	Topic	Content
1	Human Resource Planning	A. Micro B. Macro HRD applications in Hotel Industry Relevance of HRD in Hotel Industry
2	Personnel Office	A. Functions B. Operations Hotel Environments and Culture HRD Systems



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3	Job Evaluations	A. Concepts B. Scope C. Limitations Job Analyses and Job Description Job Evaluation Methods Task Analyses Demand and Supply Forecasting Human Resource Information System Human Resource Audit Human Resource Accounting Practices Recruitment and Selection
4	Attracting and Retaining Talents	Strategic Interventions Induction and Placement Staff Training and Development Training Methods and Evaluation Motivation and Productivity Motivation and Job Enrichment Career Planning
5	Employee Counseling	Performance Monitoring and Appraisal Transfer, Promotion and Reward Policy Disciplinary Issues Employees' Grievance Handling Compensation and Salary Administration Employee Benefits and Welfare Schemes Labour Laws and Regulations Related to Hotel Industry Gender Sensitivities Emerging Trends and Perspectives Impacts of Mergers and Acquisitions on Human Resource Practices

Reference Books

1. Human Resource Management for Hospitality and Tourism Industries by Dennis Nickson, Paperback
2. Human Resources Management in the Hospitality Industry. David K. Hayes, Ph.D. and Jack D. Ninemeier, Ph.D
3. Human Resource Management in the Hospitality Industry A guide to best practice Ninth edition Michael J. Boella and Steven Goss-Turner
4. HRM in Hotel and Tourism Industry - Existing Trends and



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Practices Percy K.Singh, Jain Book agency

- HRM in Hotel and Tourism Industry - Existing Trends and Practices O P Agarwal, Jain Book agency

Tourism And Hospitality Management

BSH/C5D01 Tourism and Hospitality Management

Module I: Introduction to travel and tourism:- Important phenomenon's helped the development of evolution of travel and tourism- the meaning of tourism-purpose of travel(motivations)-travelers and visitors-the industry-definitions followed in India-international tourism-basic components of tourism- elements of tourism-future of tourism

Module II: Development of means of transport: - Road transport-Sea/Water transport, Cruise industry-Rail transport-luxury trains of India-Air transport-India and international- Travel Documents.

Module III: Tourism Products:-Types (Natural, Manmade, Symbiotic) –Eco tourism, Adventure tourism- Sustainable tourism- Responsible tourism- Nature based tourism-Green tourism- Multi sport adventures- Cultural tourism- Health tourism- Rural tourism-Ethnic tourism - Spiritual tourism- Golf tourism- Space tourism- Pro poor tourism- Dark Tourism etc.- Important Tourist Destinations in India and Kerala

Module IV: Accommodation Industry- History-Types-Departments-Categorisation in India (Star)-Room types-Travel Agency-Types and Functions-Tour Operators-Types and Functions - Characteristics of tourism- Impacts of tourism (Economic, Environmental, Socio-cultural) - Reference Books

Reference Books

- Pran Seth: Successful tourism Management (Vol. 1 & 2)
- A.K Bhatia: International Tourism



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3. A.K Bhatia: Tourism Management & Marketing.
4. Christopher.J. Hollway; Longman ; The Business of Tourism
5. Cooper, Fletcher et al, (1993), Tourism Principles and Practices, Pitman.
6. P.N. Seth: Successful Tourism Development Vol. 1 and 2, Sterling Publishers
7. Page, S: Tourism Management: Routledge, London
8. Glenn. F. Ross - The Psychology of Tourism (1998), Hospitality Press, Victoria, Australia.

Basics in Culinary

BSH/C 5D02 Basics in Culinary

Module I: Cooking Principles: What is cooking?, Objectives of Cooking- The Basic Cooking Methods- Dry-Heat Cooking Methods- Moist-Heat Cooking Methods.

Module II: Knife Skills & Basic Knife Cuts: Knife Skills 101, The Anatomy of a Chef's Knife, How to Use A Chef's Knife, How To Chop an Onion, Basic Knife Cuts.

Module III: Food Safety: When Food Goes Bad- What is Cross- contamination?- Food Temperature Danger Zone - Chicken & Poultry Safety Tips- Ground Beef Safety Tips- Slow Cookers and Food Safety- Brown Bag Lunches and Food Safety- Cutting Boards and Food Safety

- Food Temperature Danger Zone - Food Poisoning Symptoms - How to Wash Your Hands. **Module IV: Stocks & Sauces: Role of Stocks and sauces in cooking-** The Mother Sauces- Stock Making Basics- Chicken Stock Recipe- Vegetable Stock Recipe - Chicken Velouté Sauce - Suprême Sauce Recipe - Making Beef Stock - Espagnole: Basic Brown Sauce - Demi-Glace Recipe

- Beurre Blanc Sauce - Béchamel Sauce Recipe - Hollandaise Sauce Recipe

Professional Business Skills

BSH3A12 Professional Business Skills

Module I

Professionalism: Meaning -Definition – Characteristics - Traits and Qualities of a good



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professional - Professionalism in business - Professional Skills: important soft skills for business success Professionalism in Communication: Verbal Communication: Professional Presentation - Different Presentation Postures- Written Communication: Email - Significance of Email in business – Email etiquette: format - rules – dos and don'ts - Technical Documentation: Standards – Types (15 Hours, 15 marks)

Module II

E-Learning :Introduction of electronic learning - benefits and drawbacks of e-Learning - Online education - Digital age learners - Knowledge resources on internet - E-books, Audio, Video and other means for e-learning- Introduction to e-content development and tools - Online libraries
– MOOCs - The e-Learning as a service Industry - major technologies used in e-learning- different approaches for eLearning delivery - E-learning in India (12 Hours, 12 marks)

Module III

Business Data Analysis : Features of New Generation Computers – Concept of data analysis – Business Data Analysis – Data Analyst – Types of analysts - organisation and source of data, importance of data quality, dealing with missing or incomplete data- Social Networking Analysis
– Big Data Analysis - Role of Data Scientist in Business & Society - Role of Artificial Intelligence and Intelligent Agents in ebusiness - Ethical and Legal considerations in Business Analytics

Module IV

Socio - Cyber Informatics: IT and society - Digital Divide – Digital natives-Cyber space- New opportunities and threats - Cyber ethics - Cyber-crimes -Types - Cyber Laws – Organisations related with cyber laws-Cyber addictions - Information overload - Health issues - e-waste and Green Computing –Recent E-governance initiatives in India

Module V

Digital Marketing : Introduction to Digital marketing Environment –meaning & Concept –



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Need for digital marketing – Advantages and disadvantages of digital marketing -Trends in digital marketingTypes of digital marketing – Business models in digital marketing Business to Business(B2B), Business to Customer (B2C), Customer to Customer (C2C), Business to Employees (B2E), Business to Government (B2G) - Online advertising - types of online advertising - Top e- commerce websites around the world and its scenario in India. PPC (Pay per Click) advertising –Search engine Analytics – search engine ads – social media channels and ads.

References Books:

1. Professional Business Skills – Lee Pelitz 2nd Edition
2. Peter Norton, Introduction to Computers, Tata McGraw Hill Private Limited, New Delhi, 2009.
3. Alan Evans, ITL ESL, Leslie Lamport, Dolores Etter, Darren George, Kenneth C Laoudon, GaryRogers, Rainer Handel, INFORMATICS -Technology in Action, Pearson Education, Delhi, 2009.
4. V.Rajaraman, Introduction To Information Technology, PHI Learning Private Limited,NewDelhi, 2009.
5. Daniel Minoli&EmmaMinoli, Web Commerce Technology Hand Book, Tata McGraw Hill, NewDelhi, 2009
6. Godfrey Parkin,DigitalMarketing:Strategies for online success,New Holland publishersLtd,2009
7. Damian Ryan,Understanding Digital marketing:Marketing strategies for Engaging the Digitalgeneration,Kogan page,3rd Edition,2014
8. Jonah Berger,Contagious Why things catch on,Simon&Schuster,2013
9. Turban E, Armson, JE, Liang, TP &Sharda, Decision support and Business Intelligence Systems,8thEdition, John Wiley & Sons, 2007
10. Frank J. Ohlhorst, Big Data Analytics, 1st Edition, Wiley, 2012.
11. Efraim Turban, Ramesh Sharda, Jay Aronson, David King, Decision Support and BusinessIntelligence Systems, 9th Edition, Pearson Education, 2009.
12. Microsoft Office 2007 Business Intelligence - Reporting, Analysis, and Measurement fromthe Desktop, Doug Harts, TATA McGraw-Hill Edition, 2008
13. Data Mining for Business Intelligence: Concepts, Techniques, and Applications in MicrosoftOffice Excel with XLMiner, GalitShmueli, Nitin R. Patel, Peter C. Bruce, Wiley Publication, 2010



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

14. Data Mining: Concepts and Techniques”, Morgan Kaufmann Publication, 3rd Edition, 2011
Data Science for Business – What you need to know about data mining and data-analytic thinking, Foster Provost, Tom Fawcett, O’ Reilly Media Publication, 2013

Entrepreneurship Development

BSH4A13 Entrepreneurship Development

Module 1

Concepts of entrepreneur: Entrepreneur- Definitions - Characteristics of entrepreneur- Classification of entrepreneur-Entrepreneurial traits -Entrepreneurial functions - role of entrepreneurs in the economic development - Factor effecting entrepreneurial growth – Entrepreneurship – Meaning – definition - Entrepreneur vs Intrapreneur - Women Entrepreneurs - Recent development – Problems - Entrepreneurial Development Programmes -Objectives of EDP - Methods of training - Phases of EDP.

(10Hours)

Module 2

Institutional support and incentives to entrepreneurs- Functions of Department of Industries and Commerce (DIC) - Activities of Small Industrial Development Corporation (SIDCO)- Functions of National Small Industries Corporation(NSIC)- Functions of Small Industries Development Bank of India (SIDBI) - Khadi Village Industry Commission (KVIC)-Small Industries Service Institute (SISI)- Functions and services of Kerala Industrial Technical Consultancy Organisation (KITCO)- Activities of Science and Technology Entrepreneurship Development Project (STEDP)-Strategies of National entrepreneurship Development Board (NEDB) -Objectives of National Institute for entrepreneurship and small business development (NIESBUD) - Techno park-Functions of techno park Incentives Importance- Classification of incentives – Subsidy - Types of Subsidy

(12 Hours)

Module 3

Micro Small and Medium Enterprises- Features- Objectives- Importance- Role of SME



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

in the economic development- MSME Act 2006- Salient features- Credit Guarantee Fund Trust Scheme for MSMEs - Industrial estates-Classification-Benefits- Green channel- Bridge capital- Seed capital assistance-Margin money schemes –Single Window System- Sickness- Causes – Remedies Registration of SSI (12 Hours)

Module 4

Setting up of Industrial unit-(Only Basic study) Environment for Entrepreneurship – Criteria for selecting particular project- Generating project ideas-Market and demand analysis-Feasibility study Scope of technical feasibility- Financial feasibility- Social cost benefit analysis-Government regulations for project clearance-Import of capital goods-approval of foreign collaboration- **Pollution control clearances- Setting up of micro small and medium enterprises-Location decision- Significance.** (15 Hours)

Module 5

Project Report - Meaning-Definition - Purpose of project reports-Requirements of good report -Methods of reporting - General principles of a good reporting system - Performa of a project report - Sample project report. (The preparation of sample project report shall be treated as an assignment of this course). (15 Hours,)

Books Recommended:

1. Shukla M.B. Entrepreneurship and small Business Management, KitabMahal Allahabad.
2. SangramKeshariMohanty, Fundamentals of entrepreneurship, PHI, New Delhi.
3. Nandan H. Fundamentals of Entrepreneurship, PHI, NewDelhi.
4. Small-Scale Industries and Entrepreneurship, Himalaya Publishing ,Delhi
5. C.N.Sontakki, Project Management, Kalyani Publishers, Ludhiana.
6. SangamKeshariMohanty. Fundamentals of Entrepreneurship, PHI, NewDelhi
7. Peter F. Drucker- Innovation and Entrepreneurship.
8. Vasanth Desai, Small Business Entrepreneurship, Himalaya Publications.
9. MSME Act 2006.

Banking and Insurance

BSH4A14 Banking and Insurance

Module 1

-Introduction to Banking : Meaning and definition - Origin and development of banking –



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Customer of a bank - Structure of banking in India - Banks and economic development - **Functions of commercial banks (conventional and innovative functions) - Central bank RBI –Functions** - Emerging trends in banking.

- Activity: List out the name of banks as per their different category
- Assignment: Procedure for creating an account in a bank

(10 Hours)

Module 2

Negotiable Instruments : Definition - Characteristics - Types - Parties to negotiable instruments - Cheques - Types of cheques - Crossing of cheques - Drafts - Cheque vs. Draft - Endorsement - Significance - Regularity of endorsement - Liability of endorser - Electronic payments.

Activity / Assignment:

- Writing of cheque , writing of challan for Demand Draft
- Procedures for a Bank Loan.

(10 Hours)

Module 3

E-Banking-centralized online real time electronic banking (CORE)-Electronic Clearing service (ECS) - Electronic Fund Transfer - Real Time Gross settlement (RTGS)—National Electronic Fund transfer(NEFT)-society for worldwide interbank financial telecommunication(SWIFT) - E-cheque - Any Time Money - ATM.s- Credit card - Debit card-smart card - Internet banking - mobilebanking - Tele-banking - financial inclusion - recent initiatives in financial inclusion.

Activity / Assignment:

- Chelan filling for RTGS, EFT and NEFT
- Different types of Cards, the Procedure for application of different cards and the Procedurefor blocking cards
- Procedure for application or activation of net banking, m-banking and tele-banking.

(15 Hours)

Module 4

Introduction to insurance: Concept - need of insurance-insurance as a social security tool – insurance and economic development-principles of insurance - various kinds of insurance - lifeand general insurance (fire, marine, medical, personal accident, property and motor vehicle insurance) - featureslife insurance Vs. general insurance.

- Activity / Assignment: List out different names of insurance companies

(15 Hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 5

Life insurance-law relating to life insurance-general principles of life insurance contract, proposal and policy—Assignment and nomination - title and claims - general insurance - lawrelating to general Insurance - IRDA - powers and functions - insurance business in India.

- Case Study: Preparation of a proposal for life insurance and how to claim insurance in case of any accident, death or damage.

(14 Hours)

Reference Books:

1. . Jyotsna Sethi and Nishwan Bhatia’s *Elements of Banking and Insurance*, published by PhiLearning Private Ltd.
2. Indian Institute of Bankers (Pub) Commercial Banking Vol-I/Vol-II (part I& II)Vol- III.
3. Varshaney: Banking Law and Practice.Sultan Chand
4. Dr. P. Periasamy: Principles and Practice of Insurance Himalaya Publishing House, Delhi.
5. Inderjit Singh, RakeshKatyal& Sanjay Arora: Insurance Principles and Practices,KalyaniPublishers, Chennai.
6. M.N. Mishra: Insurance Principles and Practice, S. Chand & Company Ltd, Delhi.
10. G. Krishnaswamy : Principles & Practice of Life Insurance
11. Kothari &Bahl: Principles and Pratices of Insurance
12. B.S. Khubchandani, "Practice and Law of Banking",MacMillan India Ltd
13. K.C. Nanda," Credit Banking", Response Book, Sage Publication,

Prose and Drama

HIN1A07(1) Prose and Drama

Module 1

Short stories and Essays

Module 2

Other forms of prose

Module 3

Drama for detailed study and evaluation

Prescribed Text Books :



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Gadyatara – Aman Prakashan ,104 A/80c Rambag, Kanpur.

Edited By : Ug Hindi Board Of Studies, Christ College (Autonomous), Irinjalakuda

Sakkubai By Nadira Zahir Babbaar- Vani Prakashan , 21-A Darya Ganj ,New Delhi

Reading List

For Module 1 :

Hari Bindi By Mridula Garg

Shavyatra By Omprakash Vatmiki

Nakhun Kyon Badhte Hai By Hazari Prasad Dwivedi

For Module 2 :

Sona By Mahadevi Varma

Sadachar Kaa Taaweez By Harishankar Parsai

For Module 3 :

Drama : Sakkubai

Notes On Course Work-

Unit Tests Are To Be Conducted Bi Monthly Twice In The Semester. A Model Test Is To Be Conducted On Completion Of The Portion Related To The Semester These Test Results Should Be Considered While Awarding Grade For Internal Assessment.

All The Activities Regarding Test Papers, Assignments, Seminars And Group Discussion Should Be Documented

Referencing And Bibliography.

- Exposed To The Origin And Development Of Hindi Drama And Its Various Themes And Forms Of Different Ages And Stages
- Helps Students Explore How Writers Use The Resources



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Language As A Creativity To Explore The Entire Range Of Human Experience Through Dramas As A Literary Form.

Grammar and Translation

HIN2A08(1) Grammar_and_Translation

Aim of the course :

To make students able to use Hindi language correctly and efficiently. To make them understand various types of letters both personal and business. To facilitate the use of translation as a tool for communication between different languages.

Objectives of the course :

Grammar is essential to the study of language. Developing a correct grammar sense is very important for written communication.

A student who successfully complete the course should be able to write in Hindi independently in their personal and professional life.

Familiarizing the technology of translation with its possibilities.

Translation from English to Hindi Hour distribution:

Module 1 : one hour

Module 2 : one hour

Module 3 : one hour

Module 4 : one hour

Samanya Hindi Vyakaran Tatha Rachana

:Sreekrishna Pandey,
Lokmangal Prakashan,
B 32,Kailash
Colony,Shahdara,Delhi.

Reading List :

For **module 1** – shabda vichar,sangya,ling,vachan,karak

For **module 2**– sarvanaam,visheshan , kriya ,kriyakeroopaantharkal ,vachya

For **module 3** - Translation from Hindi to English



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

For **module 4** – Translation from English to Hindi

Prescribed books for study :

Samanya Hindi Vyakaran Tatha Rachana
:Sreekrishna Pandey,
Lokmangal Prakashan,
B 32,Kailash
Colony,Shahdara,Delhi

Reading List :

Course Outcome

- Understand the differences between spoken and written Hindi
- Understand the factors that influence use of grammar and vocabulary in speech and writing
- Understand the different ways in which grammar has been described
- Define the link between translation theory and translation practice.
- Define the effects of translation theories on translation practice.
- Define the contribution of translation practice to translation theory

Poetry in Hindi

HIN3A09 Poetry in Hindi

Aim Of The Course :

To Sensitize The Students To The Aesthetic Cultural And Social Aspects Of Literacy Appreciation And Analysis .

Objectives Of The Course :

- Appreciation Of Poetry Using The Best Specimens Provided In An Anthology.
- Understanding The Origin And Development Of Hindi Poetry Through Selected Poems .

Course Outline :

Module 1

Ancient Hindi Poetry –A Collection Of Poems Of Ancient Poets .



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 2

Modern Hindi Poetry – A Collection Of Poems Of Different Periods Representing Different Styles And Themes.

Module 3

A Collection Of Poems Of Different Periods

Module 4

Khanda Kavya

Prescribed Text Books :

- Padya Vihar – Rajkamal Publications ,1b Netaji Subhashmarg,Dariyaganj ,New Delhi
Edited By :Ug Hindi Board Of Studies, Calicut University
- Kanupriya – Bharateeya Gyaanpeeth , 18,Industrial Area ,Lodhi Road ,New Delhi

Reading List

For Module 1

- 1.Kabeer Das -5 Dohas
- 2.Soordas – 3 Padas
- 3.Tulsidas – 3 Dohas

For Module 2

- Maithilee Sharan Gupt – Sakhi Ve Mujhse Kahkar Jaate
Niraalaa -Jaago Phir Ek Baar
Naagaarjun – Ham Bhee Saajheedaar The
Agyey- Maine Kaha Ped

For Module 3

- Arunkamal -Putalee -Mein Sansaar



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Gyanendrapati – Beej Vyatha

Anaamika - Bejagah

Jayaprakash Kardam- Mere Adhikaar Kahaan Hai

For Module 4

Dharmveer Bhaarati – Kanupriya Hour Distribution:

Novel and Short Stories

HIN4A10 Novel and Short Stories

Aim of the course :

To sensitize the students to aesthetic, cultural and social aspects of literacy appreciation and analysis. To provide them the best specimens of Hindi fiction of eminent authors of different periods.

Objectives of the course :

1. To acquaint the students with different forms of thoughts and styles of Hindi fiction.
To help them develop their thinking and writing.

Course Outline:

Module 1

Short stories from the collection

Module 2

Short stories from the collection

Module 3



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Novel

Books for study:

- Sadabhar kahaniyan –Rajpal and sons,madrassa road ,kashmiri gate,new delhi
Edited by : ug hindi board of studies, christ college (autonomous), irinjalakuda
- Sapnon kee hom delivery –mamata kaaliaya, lokbharati prakashan, darbari building, m.g road, civillines, allhabaad

Reading List :

For module 1.

1. Eedgaah –Premchand
2. Jaj ka faisala – Vishnuprabhaakar
3. Aparaadh – udayprakaash

For module 2

4. Pitha – Gyanranjan
5. Partition – swayamprakaash
6. Em dot com – S.R.Hrnot

For module 3

Novel : Mamta Kaliya –Sapnon kee hom delivery (For non-detailed study – only short questions and essay type question may be asked for examination)

Hour distribution:

Module 1&2 : Three hours Module 3 : Twohours

Note on Course work :

Unit tests are to be conducted by monthly twice inthe Semester

.A model test is to be conducted on completion of the portion related to the semester These test results should be considered while awarding Grade for internal assessment.

All the activities regarding test papers,assignments, seminars and group discussion should be documented.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Course Outcome:

- Enables the students to analyze literature and fiction using appropriate theoretical, historical, and cultural apparatus.
- Students get to know various cultures and construction of gender, nation and race throughout the history.
- The prescribed fiction helps the students to learn human values and the behavioral patterns from great works of art, and develops the ability to understand human race.

Prose Forms in Hindi Literature

HIN1A07(2) Prose Forms in Hindi Literature

Aim of the course :

To sensitize the students to aesthetic , cultural and social aspects of literacy appreciation and analysis.

Objectives of the Course :

To acquaint the students with different forms of thoughts and styles in Hindi Prose writing .

Course outline :

Module 1

Selected prose forms

- 1) essay



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2) memoir

3) story

Module 2

Selected prose forms

4) satire

5) sketch

6) Mini story

Module 3

Selected prose forms

7) Travelogue

8) one act play

Prescribed Text books :

Gadya gagan -vani prakashan, 21-a ,darya ganj,newdelhi

Edited by : ug hindi board of studies,christ college (autonomous), irinjalakuda

Reading List : For

module 1

1. Ganga Maiyya –Kaka Kalelkar
2. Hrishikesh Mukharjee ke saath dhaee din –Manohar Shyam Josh



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Bigadail bache – Maneeshaa Kulshresht
- 4.

For module 2

1. Sthree jo mahaj twacha hai –Sudheesh Pachauri
2. Rasiya- Ramvruksh beneepuri
3. Domin Kakki – ChitraMudgal

For module 3.

1. Chirapunji se aaya hun – Pradeep Pant
2. Sabse bada aadmi – Bhagavati Charan Sharma

Hour distribution:

Module 1&2: 4 hours

Module 3 : one hour

Notes of Course work :

Unit tests are to be conducted bimonthly twice in the semester. A model test is to be conducted on completion of the portion related to the semester These test results should be considered while awarding Grade for internal assessment.

All the activities regarding test papers, assignments, seminars and group discussion should be documented.

Course Outcome :

- Approach literary texts in terms of genre, gender and the canon
- Understand and use academic conventions: referencing and bibliography.
- The learner will be aware of socio-political and economic conditions of the society from different periods.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Poetry, Correspondence And Translation

HIN2A08(02) Poetry, Correspondence And Translation

Aim and Objectives of the course :

1. To sensitize the students to the aesthetic ,cultural and social aspects of literacy appreciation and analysis .To make them aware of the importance of correspondence and translation .To make them proficient to prepare certain basic kinds of letters independently in their personal and professional life.
2. Familiarizing the technology of translation with its possibilities. proficient to prepare certain basic kinds of letters independently in their personal and professional life.
3. Familiarizing the technology of translation with its possibilities.

Course Outline

Module 1

Selected poems of different periods

Module 2

Selected poems of different periods

Module 3

Correspondence- selected letters and technical terminology

Module 4

Translation passage from English to Hindi

Prescribed Text Books

1)kavyasargam - vani prakashan , 21-a ,darya ganj,newdelhi

Edited by :ug hindi board of studies,calicut

University

2)Anuvad evam patrvyavahaar -govind prakashan



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Reading List :

For module 1

1. Kabirdas – Five Dohas
2. Soordas – Three padas 3.Sumitranantan Panth – Nauka vihar
4. soorykaanth Tripathi Nirala – Juhi kee kali 5.Agyey – Naach

For module 2

6. Anamika – Mausiyaan
7. Saritha Sharma – Beti
8. Arunkamal – Mukti
9. Gyanendrapathi – Pyasaa kuan 10.Gagan Gill –Is tharah

For module 3

Letters :personal letter, application letter,letter of order,complaint letter ,business letter (bank and bima) technical terminology 1-50

For module 4

Translation from English to Hindi Hours distribution :
Module 1 &2 : Three hours Module 3 &4 two hours

Notes of Course work :

Unit tests are to be conducted bimonthly twice in the semester. A model test is to be conducted on completion of the portion related to the semester These test results should be considered while awarding Grade for internal assessment.

All the activities regarding test papers, assignments, seminars and group discussion should be documented.

Course Outcome

- Understand the common techniques underlying free verse and traditional forms of poetry
- Identify personal experiences that can be used when writing poems
- Understand the basic terminology and practical elements of poetry
- Define the link between translation theory and translation practice.
- Define the effects of translation theories on translation practice.
- Define the contribution of translation practice to translation theory
- Understand the importance of correspondence



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Prose and One Act Plays

HIN1A07(3) Prose and One Act Plays

Aim of the course :

To sensitize the students to the aesthetic , cultural and social aspects of literary appreciation and analysis.

Objectives of the course :

1. To acquaint the students with different forms of thoughts and styles used in Hindi prose writing ,to make them able to express their thoughts in these different forms.
2. To introduce Hindi one act plays to the students for appreciation and critical analysis.
3. To help them to develop their creative thinking and writing .

Course Outline :

Module 1

Different Prose Forms In Hindi

Module 2

Selected One Act Plays

Module 3

Selected One Act Plays

Prescribed Text Books :

1. Gadya Tharang :Rajpal And Sons ,Madrasa Road ,Kashmiri Gate,New Delhi

Edited By : Ug Hindi Board Of Studies,Christ College (Autonomous), Irinjalakuda

2. Kaljayee Ekanki :Aman Prakashan ,104 A/80c Rambag, Kanpur.

Edited By : Ug Hindi Board Of Studies,Christ College (Autonomous), Irinjalakuda

Reading List :

For Module 1

Selected Prose –

1. Ramvriksh Benipuri – Subhan Khan
2. Hazariprasad Dwivedi – Bheeshm Ko Kshama Nahin Kiya Gaya
3. Harishankar Parsaee – Trishanku Bechaara
4. Mohan Rakesh – Yatra Ka Romance



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 2

One Act Plays

1. Mamta Kaliya – Jan Se Pyare
2. Vinod Rastogee – Bahu Kee Vida

Module 3

3. Swadesh Deepak – Shadee Kee Bath
4. Omprakash Aditya-Rehearsal

Notes On Course Work :

Unit Tests Are To Be Conducted Bimonthly Twice In The Semester. A Model Test Is To Be Conducted On Completion Of The Portion Related To The Semester These Test Results Should Be Considered While Awarding Grade For Internal Assessment.

All The Activities Regarding Test Papers, Assignments, Seminars And Group Discussion Should Be Documented.

Course Outcome :

- Approach Literary Texts In Terms Of Genre, Gender And The Canon
- Understand And Use Academic Conventions:

Referencing And Bibliography.

- The Learner Will Be Aware Of Socio-Political And Economic Conditions Of The Society From Different Periods
- Be Familiar With The Theoretical Foundations Of The Genre;
- Be Able To Compare And Contrast The Genre With Other Dramatic Forms;

Poetry and Short Stories

HIN2A08(3) Poetry and Short Stories

Module 1

Selected Works From An Anthology Of Poems

Module 2

Selected Works From An Anthology Of Poems.

Module 3



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Selected Short Stories From A Collection Of Stories.

Module 4

Selected Short Stories From A Collection Of Stories.

Prescribed Text Books :

KAVYA GULSHAN :Aman Prakashan ,104 A/80C Rambag, Kanpur.

Edited By : UG Hindi Board Of Studies,CHRIST COLLEGE (AUTONOMOUS), IRINJALAKUDA
KAHANI KALASH

:Jawahar Pusthakaalay ,Mathura Edited By : UG Hindi Board Of Studies,CHRIST COLLEGE (AUTONOMOUS),

IRINJALAKUDA

Reading List : For Module 1

1 Kabir – 5 Dohas

2.Rahim – 5 Dohas 3.Meera Bai – One Pada

4. Jayashankar Prasad –Madhumaya Desh

For Module 2

5. Kedarnath Singh—Akal Mein Doob

6 Sarveswar Dayal Saksena –Mukti Kee Akanksha 7.Mahendra Bhatnagar –Nayee Naari

8.Gyanendrapathi -Pyasaa Kuan

For Module 3

Premchand - Bade Ghar Kee Beti Yashpal – Aadmi Ka Bacha

For Module 4

Bheeshm Sahni - Chief Kee Dawat Madhukankariya – File

Hour Distribution :

Module 1 &2 : Three Hours Module 3 &4 : Two Hours

Notes On Course Work :

Unit Tests Are To Be Conducted Bimonthly Twice In The Semester. A Model Test Is To Be Conducted On Completion Of The Portion Related To The Semester These Test Results Should Be Considered While Awarding Grade For Internal Assessment.

All The Activities Regarding Test Papers,Assignments, Seminars And Group Discussion Should Be Documented.

Course Outcome

- Understand The Common Techniques Underlying Free Verse And Traditional Forms Of Poetry



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Identify Personal Experiences That Can Be Used When Writing Poems
- Understand The Basic Terminology And Practical Elements Of Poetry.
- Students Get To Know Various Cultures And Construction Of Gender, Nation And Race Throughout The History.
- The Prescribed Fiction Helps The Students To Learn Human Values And The Behavioral Patterns From Great Works Of Art, And Develops The Ability To Understand Human Race.

Human Physiology - I

PSG1C01 Human Physiology - I

Module 1 Cellular organization (Hours - 20)

- 1.1 Cell structure, plasma membrane (fluid mosaic model), and cell organelles.
- 1.2 Cell inclusions-brief description on the structure of carbohydrates, lipids and proteins.
- 1.3 Cell theory, cell principle.
- 1.4 Unicellularity to multicellularity, differentiation. Brief mention of spatial and temporal control of gene activity.
- 1.5 Tissues- brief description of major types.

Module 2 Genes and chromosomes (Hours - 14)

- 2.1 Structure of D.N.A, D.N.A replication.
- 2.2 Concept of a gene - genetic code, introns, exons.
- 2.3 Morphology of chromosomes-size, shape, karyotype, idiogram, kinds of chromosomes.
- 2.4 Linkage and crossing over, sex linked chromosomes.



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Module 3 Cell division (Hours - 12)

- 3.1 Cell cycle.
- 3.2 Mitosis.
- 3.3 Meiosis.

Module 4 Elements of heredity and variation (Hours - 12)

- 4.1 Mendel's work and laws of inheritance (monohybrid cross, dihybrid cross, test cross).
- 4.2 Brief explanation of terms-alleles, homozygosity, heterozygosity, genotype, phenotype. Brief description of other patterns of inheritance and genotype
- 4.3 Expression-incomplete dominance, co-dominance, multiple alleles, epistasis, pleiotropy.

Module 5 Mutations and Genetic disorders (Hours - 14)

- 5.1 Gene mutation-Kinds of mutation, classification (Somatic, gametic, point, spontaneous, induced, dominant, recessive and silent mutations).
- 5.2 Gene mutation disorders - albinism, phenylketonuria, alkaptonuria, galactosemia, brachydactyli.
- 5.3 Autosomal anomalies - Down's syndrome, Edward's syndrome, Cri du chat syndrome.
- 5.4 Sex chromosomal anomalies - Klinefelter's syndrome and Turner's syndrome.

REFERENCES

1. Dewitt-Saunders, Biology of the cell.
2. Strickberger W.M-Mac Millon, Genetics.
3. Gerald Karp, Cell and Molecular Biology: Concept and Experiments.
4. Roothwell, Human Genetics, Prentice Hall.
5. Lodish;Verk; et.al; Molecular Cell Biology, W.H. Freeman publishers.
6. De Robertis, E. D. P. And De Robertis, E. M. F., Cell and molecular Biology, 7 Edn, Hol- Saunders International Editions.



CRITERION	I	Curricular Aspects
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7. Harold Harper, Review of Physiological chemistry, Marusan Co.
8. Lehninger Albert, Biochemistry, Kalyani publications, N. Delhi.
9. Plummer David T, An introduction to practical Biochemistry, Tata Mac Graw Hill.
10. Stryer Lubert & Hall John E, Biochemistry, Freemann.
11. Voet Donald & Voet Judith, Biochemistry, John Wiley sons, US.
12. Text book of Medical Physiology, AP Krishna, Scientific publication, New Delhi.
13. Molecular Biology of the Gene by James D. Watson; Michael Levine; Tania A. Baker; Alexander Gann; Stephen P. Bell.
14. Molecular Cell Biology, by Harvey Lodish, Arnold Berk, S Lawrence Zipursky, Paul Matsudaira, David Baltimore, and James Darnell.
15. Cell and Molecular Biology by E.D.P . De Robertis and E.M.F. De Robertis Jr.
16. Molecular biology of cells by B. Alberts. Bray, J. Lewis.
17. Molecular Cloning: A laboratory manual by Sambrook & Russel.
18. Genetics: Principles and analysis by Daniel L Hartl.

Human Physiology – II

PSG2C01 Human Physiology - II

Module 1 The Nervous System (Hours 20)

- 1.1 Divisions (CNS,PNS - somatic and autonomic)
- 1.2 Nervous tissue (neurons, nerve fibres, nerves, synapse).
- 1.3 Non nervous tissue and other materials (neuroglia, meninges, cerebro-spinal fluid, Blood - CSF and blood - brain barriers).
- 1.4 Nerve impulse - generation, conduction, synaptic transmission, role of calcium ions, action of transmitter substances on postsynaptic neuron, types of transmitter substances.



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Module 2 The Central Nervous System (Hours 14)

- 2.1 Brain - an overview (Forebrain, midbrain, hindbrain).
- 2.2 Spinal cord - an overview of its structure and organization.
- 2.3 Reflex Action - monosynaptic reflex, multisynaptic reflex, crossed extension reflex, mass reflex.

Module 3 The Cerebellum and the Basal Ganglia (Hours 14)

- 3.1 The Cerebellum and its motor functions.
- 3.2 Anatomical functions, areas of the cerebellum.
- 3.3 Function of the cerebellum in overall motor control.
- 3.4 The basal ganglia-their motor functions, role of the basal ganglia for cognitive control, functions of neurotransmitters with basal ganglia.

Module 4 The Cerebral Cortex (Hours 12)

- 4.1 Functions of the specific cortical areas -association areas (parieto occipito temporal, prefrontal and limbic association areas with special emphasis on Wernike's area and Broca's area), area for recognition of faces, concept of the dominant hemisphere.
- 4.2 Function of the brain in communication - Sensory and Motor aspects of communication.

Module 5 States of brain activity and Techniques in neurophysiology (Hours 12)

- 5.1 Sleep -Basic theories of sleep, Brain waves, Slow wave sleep and REM sleep.
- 5.2 Brain imaging - CT, MRI, PET, CBF, EEG, Lesioning and Electrical Stimulation of Brain (ESB).

REFERENCES

1. Schneider A.M & Tarshis B., An introduction to Physiological Psychology, Random House, New York.
2. Guyton & Hall - Textbook of Medical Physiology, 12 Edn., Saunders.
3. Sherwood L, Thomson, Human Physiology.
4. Kalat J.W, Wadsworth C.A, Biological Psychology.
5. Levinthal C.F, Introduction to Physiological Psychology, Prentice Hall, New Delhi.



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Human Physiology - III

PSG3C01 Human Physiology - III

Module 1 The Visual System (Hours 18)

- 1.1 Structure of the human eye, Organization of retina and visual pathways.
- 1.2 Functioning of the eye, visual coding, chemistry of vision, transduction in the retina, theories of color vision, visual perception.
- 1.3 Visual defects (myopia, hypermetropia, presbyopia, astigmatism, cataract, color blindness, nyktelopia).

Module 2 Auditory System (Hours 16)

- 2.1 Anatomy of the auditory system.
- 2.2 Auditory pathways, auditory perception and hearing abnormalities.
- 2.3 Statoreceptors.

Module 3 Gustatory and Olfactory system (Hours 16)

- 3.1 Anatomy of taste buds and its function, primary sensations of taste, taste thresholds and intensity discrimination, taste preferences and control of the diet.
- 3.2 Taste pathways and transmission of signals into the central nervous system.
- 3.3 Organization of the olfactory membrane, sense of smell and stimulation of the olfactory cells.
- 3.4 Categorizing smell, transmission of smell signals into the central nervous system.

Module 4 Cutaneous senses (Somatic sensations) (Hours 20)

- 4.1 Classification - the mechanoreceptive somatic senses (tactile and position), the thermoreceptive senses (heat and cold), the pain sense.
- 4.2 Detection and transmission of tactile sensations - tactile receptors, detection of vibration, tickling and itch.
- 4.3 Sensory pathways for transmitting somatic signals into the central



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- 4.4 nervous system, somatosensory cortex, position senses, position sensory receptors.
- 4.5 Thermal sensations - thermal receptors, their excitation and transmission of thermal signals.
- 4.6 Pain - purpose, types, pain receptors, pain suppressive system, pain sensation.

Module 5 Endocrine system (Hours 20)

- 5.1 Introduction to endocrinology, an overview of the importance of endocrine glands.
- 5.2 Mode of action of hormones and influence on growth and behavior.
- 5.3 Major endocrine glands - their location, structure, hormones produced and its role (Hypothalamus, pituitary, thyroid, adrenal, gonads, thymus, pineal body, placenta).

REFERENCES

1. Guyton & Hall, Textbook of Medical Physiology 12 Edn., Saunders.
2. Barrett E. Kim, Barman M. Susan et.al; Ganong's review of Medical Physiology, Tata McGraw Hill Education Pvt. Ltd.
3. Sarada Subrahmanian and K. MadhavanKutty, A Text Book of Physiology. Oriented Longman Publication.
4. Harold Harper, Review of Physiological chemistry, Marusan Co.
5. Lehninger Albert, Biochemistry, Kalyani publications, N. Delhi.
6. Plummer David T, An introduction to practical Biochemistry, Tata Mac Graw Hill.
7. Stryer Lubert & Hall John E, Biochemistry, Freeman.
8. Voet Donald & Voet Judith, Biochemistry, John Wiley sons, US.

Human Physiology - Iv

PSG4C01 Human Physiology - Iv

Module 1 Physiological basis of hunger (Hours 20)



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- 1.1 Neural control of food intake - Role of hypothalamus, Neural centers that influence mechanical process of feeding.
- 1.2 Factors that regulate quantity of food intake, role of hormones (effect of Cholecystokinin, Peptide YY, GLP, Ghrelin).
- 1.3 Short-term regulation of food intake, intermediate and long-term effect of food intake. (Effect of blood concentrations of glucose, aminoacids, lipids on hunger and feeding), temperature regulation of food intake.
- 1.4 Obesity - causes and treatment, Eating disorders (Bulimia, Anorexia, Inanition, Cachexia, Picca).

Module 2 Physiological basis of thirst (Hours 14)

- 2.1 Peripheral factors in water regulation.
- 2.2 Central factors in water regulation (cellular dehydration thirst and hypovolemic thirst).

Module 3 Physiological basis of sexual behaviour (Hours 20)

- 3.1 Hormones and sexual development - Fetal hormones and the development of reproductive organs, Sex differences in the brain, Perinatal hormones and behavioral development, Puberty: hormones and development of secondary sexual characteristics.
- 3.2 Effects of gonadal hormones on adults - Male reproduction related behavior and testosterone, Female reproduction related behavior and gonadal hormones.
- 3.3 Neural mechanisms of sexual behavior - Structural differences between the male hypothalamus and female hypothalamus, the hypothalamus and male sexual behavior, the hypothalamus and female sexual behavior.

Module 4 Neural basis of emotion (Hours 18)

Role of frontal lobes.

- 4.1 Behavioral functions of the hypothalamus and associated limbic structures, Reward centers, Rage - its association with punishment centers, placidity and tameness.
- 4.2 Functions of Amygdala.

Module 5 Brain Damage and Neuroplasticity (Hours 18)

- 5.1 Causes of brain damage - Brain tumors, Cerebrovascular disorders (Cerebral hemorrhage, Cerebral ischemia), Infections of the brain (Bacterial infections, Viral infections), Neurotoxins, Genetic factors, Apoptosis.
- 5.2 Neuropsychological disorders - Epilepsy (Grand Mal Epilepsy, Petit Mal Epilepsy and Focal Epilepsy),



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Parkinson's disease, Huntington's disease, Multiple sclerosis, Alzheimer's disease.

REFERENCES

- Schneider A.M & Tarshis B, An introduction to Physiological Psychology, Random House, New York.
- Guyton & Hall, Saunders, Textbook of Medical Physiology.
- Sherwood L, Thomson, Human Physiology.
- Kalat J.W, Wadsworth C.A, Biological Psychology.
- Levinthal C.F, Introduction to Physiological Psychology, Prentice Hall, New Delhi.
- Pinel P.J John, Biopsychology, Pearson.
- Neil.R.Carlson, Physiology of behavior, Pearson publishers.
- Barrett E. Kim; Barman M. Susan et al., Ganong's Review of Medical Physiology; Tata McGraw Hill Education Pvt. Ltd.
- Alcock John, Animal Behavior, 6th edition, Sinauer Associates, Inc. Sunderland, Massachusetts.
- Carlson, Neil, R., Physiology of Behavior, 8 edition, Pearson.

Basic Themes in Psychology - I

PSY1B01 Basic Themes in Psychology - I

Module 1 Introduction (16 hours)

Psychology: A working definition.

Origin of Psychology: Philosophical origins; Early Indian and Greek thoughts, major ideas of Descartes, Locke. Biological origins; Darwin, Genetics. Brief history of modern scientific psychology: structuralism, functionalism, behavioral, psychoanalytic, humanistic, cognitive perspectives, Gestalt psychology. Branches of Psychology, Scope of Psychology.



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Methods of psychology: Observation-participant and non-participant observation, naturalistic observation; Interview methods-structured, semi structured and unstructured interviews; Surveys; case study; Questionnaires; Correlational studies; experimental method.

Module 2 Attention and Perception (16 hours)

Attention: selective and sustained attention; Factors affecting attention; Phenomena associated with attentionspan of attention, division of attention, distraction of attention.

Sensation and perception: Difference between sensation and perception: sensory threshold; absolute threshold; difference threshold; just noticeable differences; subliminal perception.

Perceiving forms, patterns and objects: perceptual set, feature analysis, bottom-up processing, top-down processing. Perceptual organization; Gestalt principles, figure and ground segregation, phi-phenomenon.

Perceptual constancies: size, shape, brightness constancies. Visual illusions; Theories of color vision; Theories of auditory perception.

Module 3 States of Consciousness (14 hours)

Nature of consciousness; Biological rhythms: circadian rhythms; Sleep and waking cycle: stages of sleep; functions of sleep; functions of REM sleep; sleep disorders -Dreams: psychodynamic, physiological and cognitive views. Altered states of consciousness: Hypnosis; Meditation. Altering consciousness with drugs- Brief outline on psychoactive drugs.

Module 4 Learning (18 hours)

Concept of learning, Nature of learning, learning curve.



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Types of Learning; Associative learning (Classical and operant conditioning) and Cognitive learning. Classical conditioning: Basic experiment and basic terms; Principles of Classical Conditioning- Acquisition, Higher order conditioning, Extinction, spontaneous recovery, Generalization and Discrimination. Applications of classical conditioning. Operant conditioning; Law of effect; Basic experiment of Skinner; Reinforcement, Punishment, Shaping and Chaining; Schedules of reinforcement. Applications of operant conditioning.

Cognitive learning: Cognitive map; latent learning; sign learning. Observational learning/ Modeling.

References

1. Baron R.A. (2004). Psychology, 5th ed. New Delhi: Pearson education.
2. Bootzin R., & Bower G.H. (1991). *Psychology today- An Introduction*. 7th ed. New York: Mc Graw Hill Inc.
3. Commer R. & Gould E. (2011). Psychology around Us. New Delhi: John Wiley & Sons Inc.
4. Coon D.& Mitterer J.O. (2013) Introduction to Psychology: Gateways to Mind and Behavior, 13th ed. Wadsworth, Cengage Learning
5. Feldman R. (2011). Understanding Psychology, 10th edition. New Delhi: Tata McGraw Hill.
6. Morgan C.T., King R.A., Weisz J.R., & Schopler J. (1993). Introduction to Psychology, 7th ed. New Delhi: Tata McGraw Hill.
7. Weiten W. (2002). Psychology: Themes and Variations, 5th ed. New York: Brooks/Cole Publishing co.

Additional References:

1. Gerrig R. J (2013) *Psychology and Life* (20th Edn) Boston: Pearson
2. Kuppaswamy B. (1990). *Elements of ancient Indian Psychology*, 3rd ed. New Delhi: Konark Publishers Pvt. Ltd.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Mishra B.K. (2008). Psychology: *The study of Human Behavior*. New Delhi: Prentice Hall of Ind.

Basic Themes in Psychology - II

PSY2B01 – Basic Themes in Psychology - II

Module 1 Cognitive Processes (16 hours)

Basic units of Thought: Concepts; forming concepts, Types of concepts, prototypes; Images;

Language, the structure of Language, Role of language in thinking. Reasoning; Deductive and inductive thinking. Problem solving; Types of problems, steps and barriers to effective problem solving, approaches or strategies of problem solving-trial and error, heuristics, algorithm, forming sub goals, searching for analogies, changing the representation of the problem; Culture, cognitive style and problem solving. Creative thinking; convergent and divergent thinking; stages of creative thought. Decision making; Heuristics and judgment availability heuristics, representativeness heuristics, anchoring heuristics.

Module 2 Memory (18 hours)

Key processes in memory: Encoding, Storage and Retrieval.

Atkinson-Shiffrin Model; sensory memory, short term memory and long-term memory; Levels of processing.

STM; Iconic memory; Working memory, Alan Baddeley's components of working memory; Chunking; Rehearsal-maintenance rehearsal, rote rehearsal, elaborative rehearsal.



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LTM; Types of LTM-procedural memory, declarative memory-semantic memory, episodic memory; Flashbulb memory, tip of the tongue phenomenon. Implicit and explicit memory-priming. Measuring memory; Recall, Recognition, Relearning. Retrieval cues; Encoding specificity principle; Context dependent memory, State dependent memory; Serial position effect; Reconstructive memory; Source Monitoring; Eyewitness testimony; False memory; Metamemory. Forgetting: Curve of forgetting; Reasons of forgetting-ineffective coding, decay, interference, retrieval failure, motivated forgetting; Repression.

Strategies for remembering; Rehearsal, Elaboration, Organisation (Mnemonics).

Module 3 Motivation (16hours)

Motivation; A model of Motivation; Sources of Motivation-Drives, Incentives, Instincts.

Theories of motivation: Drive theory; Incentive theory; Hierarchy of needs theory; Arousal theory-YerkesDodson's Law; Goal setting theory; Evolutionary theory; Cognitive Theories-Balance theory, Cognitive dissonance theory, Expectancy theory, Attribution theory. Types of Motives; Biological motives and learned motives. The motivation of hunger and eating: Biological factors in the regulation of hunger; Environmental factors in the regulation of hunger: Sexual motivation; Hormones and human sexual behavior; Sexual orientation.

Achievement motivation: Individual differences; situational determinants of achievement behaviour; Measuring achievement motivation.

Aggressive motive; Power motive; Affiliation motive. Intrinsic and extrinsic motivation.

Module 4 Emotion 14 hours

Emotion: The elements of emotional experience; The cognitive component, The physiological component; The behavioural component; Primary emotions; Positive emotions.

Emotion and the brain; Physiology and emotion; fight or flight, sudden death, lie detectors.



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Expression of emotions; Facial expressions, non-verbal cues and body language; Assessment of emotions. Theories of emotion: James-Lang theory; Cannon-Bard theory; Opponent process theory; Cognitive appraisal theories of emotion-Schachter's two-factor theory and Lazarus's theory of cognitive appraisal; Facial feedback hypothesis; Evolutionary theories of emotion.

References

1. Baron R.A. (2004). Psychology, 5th ed. New Delhi: Pearson education.
2. Bootzin R., & Bower G.H. (1991). *Psychology today- An Introduction*. 7th ed. New York: Mc Graw Hill Inc.
3. Commer R. & Gould E. (2011). Psychology around Us. New Delhi: John Wiley & Sons Inc.
4. Coon D. & Mitterer J. O. (2013) Introduction to Psychology: Gateways to Mind and Behavior, 13th ed. Wadsworth, Cengage Learning
5. Feldman R. (2011). Understanding Psychology, 10th edition. New Delhi: Tata McGraw Hill.
6. Morgan C.T., King R.A., Weisz J.R., & Schopler J. (1993). Introduction to Psychology, 7th ed. New Delhi: Tata McGraw Hill.
7. Weiten W. (2002). Psychology: Themes and Variations, 5th ed. New York: Brooks/Cole Publishing co.

Additional References:

1. Gerrig R. J (2013) *Psychology and Life* (20th Edn) Boston: Pearson
2. Kuppaswamy B. (1990). *Elements of ancient Indian Psychology*, 3rd ed. New Delhi: Konark Publishers Pvt. Ltd.
3. Mishra B. K. (2008). Psychology: *The study of Human Behavior*. New Delhi: Prentice Hall of India



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Psychological Measurement & Testing

PSY3B01 Psychological Measurement & Testing

Module 1: Introduction to Measurement and Scaling Techniques 12 Hours

Definition of measurement, Levels of measurement: Nominal, Ordinal, Interval and Ratio scales, Properties of scales of measurement: Magnitude, equal interval and absolute zero, Distinction between psychological measurement and physical measurement, Problems in psychological measurements.

Concepts of psycho physics: Absolute threshold, Difference threshold, Weber's law, Fechner's law,

Psychophysical/ psychological scaling methods- Method of Average Error, Method of Minimal Changes, Method of Constant Stimuli, Method Of Pair Comparison, Method Of Rank Order

Module 2: Nature and Use of Psychological Tests 10 Hours

Definition of psychological test, Historical perspective of psychological testing

Uses of psychological test, Characteristics of a good test: Objectivity, Reliability, Validity, Norms, and Practicability, ethical issues in psychological testing, Factors influencing Test Administration- Examiner, Testing Conditions, Test Taker. Classification of psychological tests: Speed test and power test, Individual and group tests, Verbal, Non-verbal and performance tests, culture specific and culture free tests, Objective and subjective tests.

Module 3: Test Construction and Administration 12 Hours

Introduction to steps of test construction- Planning, Writing, meaning and purpose of item analysis, Administration, Standardisation, Meaning of Reliability, Types of reliability, Meaning of Validity, aspects of validity – face validity, content validity; construct validity, criterion-related validity, Concept of Norms –norm referenced and criterion- referenced norms, types of norms- percentile, standard score, age equivalent, grade equivalent and T-score.



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Module 4: Basics of Psychological research 14 Hours

Meaning and characteristics of scientific research, types of research: historical, basic versus applied research, experimental versus descriptive/non experimental.

Research Process- identifying the problem-types of problems, hypothesis- types of hypothesis, variables-dependent, independent, extraneous variables, formulating research design, reviewing the literature-sources of review, Sampling- fundamentals of sampling,

Data collection techniques-questionnaire and schedule, interview, content analysis, observation, rating scale, carrying out statistical analysis-difference between descriptive and inferential statistics, drawing conclusions.

Structure of a research report, APA style of writing research report

References

1. Singh A. K. (2008). Tests, Measurements and research Methods in Behavioural Sciences (3rd ed.). Patna: Bharati Bhawan Publishers
2. Chadha. N. K. (2009). Applied Psychometry. New Delhi: Sage Publications India Pvt Ltd.
3. Anastasi A., & Urbina S. (2005) Psychological Testing (7th ed.) New Delhi: Prentice – Hall Of India.

Kaplan R. M.& Saccuzzo D. P (2007), Psychological Testing –Principles, Applications And Issues. (6th Edition). New Delhi Thomson And Warsworth

Additional references

1. Kothari, C. R. (2009). Research Methodology- Methods & Techniques. (2nd ed.). India: Repro India Limited



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2. Goodwin C J. (2002). Research in Psychology: Methods and design (3rd ed.) New York: John Wiley & Sons,

Inc

3. Evans, A. N & Rooney, B. F. (2008) Methods in Psychological Research. USA: Sage Publication

Individual Differences

PSY4B01 Individual Differences

Module 1: Intelligence 12 hours

Definition, nature and meaning of intelligence, Determinants of intelligence – Role of heredity and environment. Theories of intelligence- Spearman-Two factor, Cattell- Fluid and crystallized intelligence, Guilford’s structure of intellect model, Thurstone’s –primary mental abilities, Sternberg- Triarchic approach, Gardner-Multiple intelligence theory, Goleman’s emotional intelligence theory.

Module 2: Assessment of intelligence, Aptitude and achievement 10 hours



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Assessment of intellectual abilities-history of assessment- Sir Francis Galton, Alfred Binet, Lewis Terman – concept of IQ, intelligence tests-Stanford-Binet intelligence scale, Wechsler scale, Kaufman’s Scale, Raven’s Progressive Matrices, Bhatia’s Test Of Intelligence, Seguin-Form Board Test, Extremes of intelligence Define Aptitude and Achievement, Distinction Between Aptitude Test And Achievement Test, Uses Of Achievement Tests, Types Of Aptitude Test- DAT, GATB, Sensory Tests, Motor Dexterity Test.

Module 3: Personality 12 hours

Concept of Personality, Psychodynamic approaches. Freud’s theory: instinct theory, Levels of consciousness, structure of personality, defense mechanisms, psychosexual stages of

Module 1: Intelligence 12 hours

Definition, nature and meaning of intelligence, Determinants of intelligence – Role of heredity and environment. Theories of intelligence- Spearman-Two factor, Cattell- Fluid and crystallized intelligence, Guilford’s structure of intellect model, Thurstone’s –primary mental abilities, Sternberg- Triarchic approach, Gardner-Multiple intelligence theory, Goleman’s emotional intelligence theory.

Module 2: Assessment of intelligence, Aptitude and achievement 10 hours

Assessment of intellectual abilities-history of assessment- Sir Francis Galton, Alfred Binet, Lewis Terman – concept of IQ, intelligence tests-Stanford-Binet intelligence scale, Wechsler scale, Kaufman’s Scale, Raven’s Progressive Matrices, Bhatia’s Test Of Intelligence, Seguin-Form Board Test, Extremes of intelligence Define Aptitude and Achievement, Distinction Between Aptitude Test And Achievement Test, Uses Of Achievement Tests, Types Of Aptitude Test- DAT, GATB, Sensory Tests, Motor Dexterity Test.

Module 3: Personality 12 hours

Concept of Personality, Psychodynamic approaches. Freud’s theory: instinct theory, Levels of consciousness, structure of personality, defense mechanisms, psychosexual stages of development. Jung:



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Structure of personality, Basic concepts in Individual Psychology. Horney: Basic anxiety, styles, **feminist turn in psychoanalysis.**

Trait and Type theories: general approach. Allport: traits. Cattell: source and surface traits, Eysenck: dimensions of personality. **Introduction to Humanistic perspective: Rogers, Maslow.**

Module 4: Assessment of Personality 14 hours

Meaning and purpose of personality assessment. Tools of personality assessment -Self report inventories, Strength and weakness of self report inventories, 16PF, MMPI, EPQ: General outline about these tests. Questionnaires and Inventories, Projective measures of personality – Strengths and weakness of projective tests, **TAT, Other measures: Behavioral Observation and Interviews, situational tests. Measurement of interest- types of interest tests, Strong Interest Inventory. Strengths and Weaknesses of Projective tests.**

References

1. Passer M.W. & Smith. R E. (2007) Psychology-the science of mind and behavior (3rd ed.). New Delhi: Tata McGraw Hill
2. Singh A. K. (2008). Tests, Measurements and research Methods in Behavioural Sciences (3rd ed.). Patna: Bharati Bhawan Publishers
3. Gerrig R. J &Zimbardo.P.G. (2005). Psychology and Life (17th ed.) New Delhi: Pearson Education.
4. Anastasi A., & Urbina S. (2005) Psychological Testing (7th ed.) New Delhi: Prentice –Hall Of India.
5. Coon D. (1983). Introduction to Psychology: Exploration and Application. New York: West Publishing Co.



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6. Morgan C.T., King R.A., Weisz J. R. & Schopler J. (1993). Introduction to Psychology, 7th ed. New Delhi: Tata McGraw Hill

Additional References

1. Weiten W. (2002). Psychology: Themes and Variations, 5th ed. New York: Brooks/ Cole Publishing Co.
2. Baron R.A. (2004). Psychology, 5th ed. New Delhi: Pearson education.
3. Bootzin R., & Bower G.H. (1991). Psychology today- An Introduction. 7th ed. New York: McGraw Hill Inc.
4. Feldman R. (2011). Understanding Psychology, 10th edition. New Delhi: Tata McGraw Hill.

Abnormal Psychology - I

PSY5B01 Abnormal Psychology - I

Module 1: Basic concepts 8 hours

Mental disorder, classification, Historical views of abnormal behaviour, causal factors- Biological, psychosocial and socio cultural factors

Module 2: Stress disorders and anxiety disorders (10 hours)

Stress and stressors- Coping strategies, stress disorders: Adjustment Disorder-Post traumatic stress disorder;

Anxiety disorder: specific phobia, social phobias, Generalized Anxiety disorders, obsessive-compulsive disorders and causal factors

Module 3: Somatoform and dissociative disorder (16 hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Somatic Symptom Disorders, Hypochondriasis, Somatization Disorder, Pain Disorder, Conversion Disorder; Dissociative Disorders - Depersonalization/ Derealization Disorder, Dissociative Amnesia and Dissociative Fugue, Dissociative Identity Disorder (DID). causal factors

Module 4: Personality disorders (14 hours)

Cluster A Personality Disorders-Paranoid Personality Disorder, Schizoid Personality Disorder, Schizotypal Personality Disorder. Cluster B Personality Disorders- Histrionic Personality Disorder, Narcissistic Personality Disorder, Antisocial Personality Disorder, Borderline Personality Disorder.

Cluster C Personality

Disorders - Avoidant Personality Disorder, Dependent Personality Disorder, Obsessive-Compulsive Personality Disorder. Causal Factors.

Reference

1. Butcher J. N. Hooley J. M. & Mineka S. (2014) Abnormal Psychology (16th ed.) U. S. A : Pearson Education, Inc.
2. Carson R. C. Butcher J. N. & Mineka S. (1996) Abnormal Psychology and Modern life (10thed.). New York: Harper Collins College Publishers.
3. Seligman M. E. P. Walker E. P. & Rosenhan D. L. (2001). Abnormal Psychology (4thed.). New York: W. Norton & Company, Inc.
4. Sadock B. J, Sadock V. A. & Ruiz P. (2015) Kaplan & Sadock’s Synopsis of Psychiatry Behavioral Sciences/ Clinical Psychiatry (11th ed.). U. S. A: Wolters Kluwer.

Social Psychology

PSY5B02 Social Psychology



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 1: Introduction to Social Psychology 10 hours

Origin and Development of Social Psychology, Definition, Nature, Goal and Scope of Social Psychology, Methods of social psychology

Module 2: Social perception and Attitudes 13 hours

Social Perception-Definition, Non-Verbal Communication- facial expression, gazes, stares, body language, touching, deception and micro expressions. Attribution - Definition, Theories - Correspondence inference, Kelly's theory, Applications of attribution theory

Attribution Errors. Attitude and behaviour - Definition, nature, components, functions and formation of attitudes.

Module 3: Group, Leadership and Social Influence 13 hours

Groups: nature and functions. Types and theories of leadership. Social facilitation, social loafing. Social influence: Conformity, Factors affecting conformity. Compliance: Underlying Principles and tactics. Obedience and destructive obedience

Module 4: Interpersonal attraction and prosocial behavior 12hours

Interpersonal attraction: beginning of attraction, proximity, emotions, affiliation need. Becoming acquainted- situational determinants-Love- Triangular Model of love.

Prosocial behavior -Responding to emergency, Steps. Altruistic personality. Volunteering. Explaining prosocial behavior: Empathy altruism model, negative state relief model, empathic joy hypothesis, genetic determinism.

References

1. Baron R.A., Branscombe N.R., Byrne D., & Bhardwaj G. (2009). Social Psychology, 12th ed. New Delhi: Pearson Education.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Baron R.A., & Byrne D. (2002). Social Psychology, 10th ed. New Delhi: Pearson Education.
- Chaube S.P., & Chaube A. (2006) Groundwork for Social Psychology (Vol.1) Hyderabad: Neelkamal Publications Pvt. Ltd.
- Feldman R.S. (2001). Social Psychology, 3rd ed. N J. Pearson Education.
- Michener H. A., Delamater J.D., & Myers D.J. (2004). Social Psychology. Australia: Thomson Wadsworth Publication.
- Myers D.G. (1999). Social Psychology, 7th ed. New Delhi: Pearson Education

Developmental Psychology - I

PSY5B03 Developmental Psychology - I

Number of Credits: 3

Number of Contact Hours: 48 Hrs.

OBJECTIVES

- To study human development in Psychological Perspectives
- To create awareness about major Psychological changes along with physical development

Module 1: Introduction and theories to Life Span Development (10 hours)

Historical foundation of developmental psychology. Growth and development- Different Theories of development (Brief): Freud, Behaviorist, social learning, Vygotsky, Periods of Development and Erikson's Theory. Developmental tasks of each stages of development.

Module 2: Prenatal Development (14 hours)

Fertilization- Germinal Period, Embryonic Period, Fetal Period- Effect of long term & short term use of Teratogens- Birth Process: Types, methods- prenatal and perinatal diagnostic tests. Birth Complication and their effects. Post partum period- physical, emotional adjustment.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 3: Physical Development (10 hours)

Newborn reflexes, Gross and fine motor skills. Perceptual development in infancy. Physical development from childhood to adolescence. Physical condition and health issues in early & middle adulthood.

Module 4: Cognitive Development (14hours).

Piaget’s theory of Cognitive Development: Process of development, 4 stages- Sensory Motor, Preoperational, Concrete operational and Formal Operational stage. Language development: Pre-linguistic, Phonological, Semantic, Grammatical and Pragmatic Development. Cognitive changes in early adulthood- Post formal thought, Schaie's Model of Cognitive Development, Sternberg -Cognitive Development of middle adulthood.

Reference

1. Berk L.E (2003) Child Development (3rd de). New Delhi: Pearson Education Pvt Ltd.
2. Hurlock E.B (1996) Developmental Psychology-A Life span Approach. New Delhi: Tata McGraw Hill Publishing Company.
3. Papalia D.E et.al (2004) Human Development (9th Ed). New Delhi: Tata McGraw Hill Publishing Company.
4. Santrock J.E (2007) Child Development (2nd end) New Delhi: Tata McGraw Hill Publishing Company.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Psychological Counselling

PSY5B04-Psychological Counselling

Module 1 (16 hours)

Counseling and Helping. Definition and scope of Counselling. Goals of counseling. Conditions facilitating effective counselling. Counsellor and counsellee characteristics. Characteristics of an effective counsellor.

An overview of Egan’s Model – Problem-management and Opportunity-development approach to Helping

– Outline of the three stages. Stage 1 – The Current Picture: Help clients clarify the key issues, Stage 2- The preferred picture: Help clients identify and set goals. Stage 3- The Way Forward: Help clients develop strategies and plans for goal implementation

Module 2 (8 hours)

Approaches to counselling: Person-centered counselling, Psychoanalytic counselling, Cognitive counselling, Behavioral counselling, Eclectic approach

Module 3 (14 hours)

Counseling Skills and Techniques

Opening Techniques – Greeting, topics, physical arrangements, attitudes, Nonverbal skills (SOLER), Rapport building. Listening techniques - Active listening, forms of poor listening

Open-ended questions, Silence, Focusing, Empathic responding, Paraphrasing and reflecting, Probing and

Summarising, Structuring

Acceptance techniques, Structuring techniques, Leading techniques, Reassurance and suggestion methods,



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Challenging, Interpretation & confrontation, Timing & Pacing, Advanced empathy Divergent thinking, Goal setting, Decision making, Problem solving, Role playing, Advice and information giving strategies, Terminating skills

Module 4 (10 Hours)

Applications of Counselling in various settings (briefly): School counselling, Career Counseling and Guidance, College counselling, Premarital counselling, HIV/AIDS counselling, counselling for terminally ill.

Group counseling

Values in counselling. Ethics in counselling. Legal aspects in counselling. Professional codes.

Note: A few major skills like active listening, paraphrasing and reflecting are to be practiced through role plays in the class.

Reference

1. Capuzzi D. (2007). *Counselling and psychotherapy: Theories and intervention*. New Delhi: Dorling Kindsley.
2. Egan G. (1990). *The skilled helper: A systematic approach to effective helping*. Thomson Brooks/Cole Publishing Co.
3. Jones R. N. (2008). *Basic Counselling Skills- A helper's manual*. New Delhi: Sage Publishers.

Health Psychology

PSY5B05-Health Psychology

Module 1: introduction to health psychology (12 hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Definition of Health Psychology, Mind Body Relationship, Need And Significance of Health Psychology, Biopsychosocial Model V/S Biomedical Model

Module 2: health behaviour and primary prevention (12 hours)

Health Behaviours, Changing Health Habits-Attitude Change, Cognitive Behavioural Approach-Health Belief Model, Theory Of Planned Behaviour, Trans Theoretical Model, Protection Motivation Theory, Social Cognitive Theory And Attribution Theory, Models Of Prevention

Module 3: stress and coping (12 hours)

Stress, Theoretical Contributions To Stress-Fight-Flight, Selye’s General Adaptation Syndrome, Tend – Befriend, Psychological Appraisal & Stress, Coping: Moderators Of Coping-Personality, Social Support, Other Life Stressors, Stress Management Programmes

Module 4: psychosocial issues and management of advancing and terminal illness (12 hours)

Emotional Responses To Chronic Illness, Psychosocial Issues —Continued Treatment, Issue Of Non Traditional Treatment, Stages To Adjustment To Dying, Psychological Management Of Terminal Illness
Medical Staff And Terminal Ill Patient, Individual Counselling, Family Therapy, Management Of Terminal Illness In Children

Reference

1. Taylor E. S. (2006). Health Psychology (6TH EDITION), MC Graw Hill Companies, California.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Additional Reference

1. Naima Khatoun (2012). Health Psychology, Dorling kindersley (INDIA) Pvt. Ltd.

Marks F.D., Murray M., Evans B., and Estacio V. M. (2011) Health Psychology: Theory, Research and Practice (3rd edition). Sage Publications India Pvt. Ltd

Abnormal Psychology - II.

PSY6B01 Abnormal Psychology - II.

Module 1: Substance abuse disorder (18 hours)

Alcohol Related Disorders - Clinical Picture of Alcohol Related Disorders, Biological Causal Factors in the Abuse of and Dependence on Alcohol, Psychosocial Causal Factors in Alcohol Abuse and Dependence, Sociocultural Causal Factors. Drug Abuse and Dependence - Opium and Its Derivatives (Narcotics), Cocaine and Amphetamines (Stimulants), Methamphetamine, Barbiturates (Sedatives), Hallucinogens, Ecstasy, Marijuana, Stimulants

Module 2: Schizophrenia and other psychotic disorder (18 hours)

Schizophrenia - Origins of the Schizophrenia Construct, Epidemiology, Clinical Picture-Delusions, Hallucinations, Disorganized Speech and Behavior, Positive and Negative Symptoms. Subtypes of Schizophrenia, Other Psychotic Disorders -Schizoaffective Disorder, Schizophreniform Disorder, Delusional Disorder, Brief Psychotic Disorder. Causal factors.

Module 3: Mood Disorder (16 hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Mood Disorders: Types of Mood Disorders. Unipolar Depressive Disorders -Major Depressive Disorder, Other Forms of Depression, Premenstrual Dysphoric Disorder, Dysthymic Disorder (Persistent Depressive Disorder). Bipolar and Related Disorders-Cyclothymic Disorder, Bipolar Disorders (I and II). Causal Factors.

Module 4: Developmental disorders 12hours

Attention-Deficit/Hyperactivity Disorder, Conduct Disorder, Autism Spectrum Disorder, Specific learning Disorders, Intellectual Disability. Causal factors.

Reference

1. Butcher J. N., Hooley J. M., & Mineka S. (2014). Abnormal Psychology (16th ed.). U. S. A: Pearson Education, Inc.
2. Carson R. C., Butcher J. N., & Mineka S. (1996). Abnormal Psychology and Modern life (10th ed.). New York: Harper Collins College Publishers.
3. Seligman M. E. P., Walker E. P. & Rosenhan D. L. (2001). Abnormal Psychology (4th ed.). New York: W. Norton & Company, Inc.
4. Sadock B. J., Sadock V. A., & Ruiz P. (2015). Kaplan & Sadock’s Synopsis of Psychiatry Behavioral Sciences/ Clinical Psychiatry (11th ed.). U. S. A: Wolters Kluwer.

Applied Social Psychology

PSY6B02 – Applied Social Psychology

Module 1: Foundations of Applied Social psychology (16 hours)

Social psychology and related disciplines. Applied social psychology: historical context.

Module 2: Applying Social psychology to Clinical and Counseling Psychology (16 hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Psychological theories- cognitive dissonance theory, group think theory.

Social psychological roots of social anxiety. Social psychological model of depression. Treatment and prevention- self presentation theory, hopelessness theory and **biases in clinical decision making.**

Module 3: Applying Social psychology to the Media and Aggression (16 hours)

Consequence of viewing media violence- fear, aggressive thoughts. Effects of exposure to violent pornography. Reducing the harmful effects of exposure to violent sexual material. Effects of media influence on our thought. Aggression. Theoretical perspectives on aggression: role of biological factors, drive theories, modern theories of aggression. Determinants of aggression: social, personal, situational. Prevention and control of aggression.

Module 4: Social problems in India and applying Social Psychology (16 hours)

The concept of social problems, characteristics, causes, types, stages in the development of social problems, and solving social problems. Brief description about the concept of poverty, unemployment, population explosion, child abuse and child labor.

References

1. Chaube S.P., & Chaube A. (2006). *Groundwork for Social Psychology (Vol.1)* Hyderabad: Neelkamal Publications Pvt. Ltd.
2. Myers D.G. (1999). *Social Psychology, 7th ed.* New Delhi: Pearson Education.
3. Ram Ahuja (1999). *Social Problems in India.* Jaipur and New Delhi: Rawat Publications.
4. Schneider F.W., Gruman J.A., & Coutts L. M. (2005). *Applied Social Psychology: Understanding and addressing social and practical problems.* New Delhi: Sage Publication.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Developmental Psychology - II

PSY6B03 Developmental Psychology - II

Module 1: Emotional Development (12 hours)

Emotion- types of emotions. Emotional behavior in infancy to middle adulthood. Temperament: definition, different classifications. Self-development role of family, parenting and peer relations in emotional development. Close relationships in adulthood. Adult life changes, marriage and family in adulthood.

Module 2: Social Development (12 hours)

Process of socialization from infancy to middle adulthood. Vygotsky's theory of social development - ZPD Development of attachment: types, Bowlby's Ethological theory of attachment, Factors affecting attachment. Marital Life Style & Parenthood in Young Adulthood. Empty nest syndrome. Attraction, love and close relationships- adult marriage life. Moral development- theories: Piaget, Kohlberg.

Module 3: Vocational Development (12hours)

Vocational development and adjustment in early adulthood. Career, work and leisure in middle adulthood. Selecting a job, appraisal of vocational adjustment. Work life balancing. Vocational adjustment in Middle Adulthood-Changed working conditions that affect middle aged workers, conditions influencing vocational adjustment and satisfaction in middle age.

Module 4: Late adulthood (12 hours)

Characteristic of late adulthood. Gerontology. Physical –cognitive – language- and socio-emotional development in late adulthood. Development of personality and self. Family and relationships.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Biological theories of ageing. Vocational adjustment and adjustment to retirement in late adulthood.
Facing death and loss: Psychological issues, Pattern of grieving, special losses.

References

1. Hurlock, Elizabeth. B(1996). *Developmental Psychology: A Life-Span Approach*. New Delhi: Tata McGraw Hill Publishing Company.
2. Papalia, Diane. E et. Al (2004). *Human Development, 9th ed.* New Delhi. Tata McGraw Hill Publishing Company Limited.
3. Santrock J. E (2007) *Child Development (2nd end)* New Delhi: Tata McGraw Hill Publishing Company

Life Skill Education: Applications and Training

PSY6B04 Life Skill Education: Applications and Training

Module 1 Introduction to life skills (12hours)

Life skill; Need and importance-definition and interpretation by WHO-Origin and development of concept of life skill.

Module 2 Mother Skills, Survival skills and Communication skills (12 hours)

Mother skills: self-awareness – development of self-theories-assessment; empathy. Survival Skill: inter personal and intrapersonal orientations, interpersonal attraction & theories-skill to develop relations and resolve conflicts. Effective communication: components of communication. Listening-verbal and non-verbal skills.

Module 3 Thinking Skills, Coping Skills (12 hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Thinking skills: Critical thinking & creative thinking and media thought.

Negotiating skills: Decision making-problem solving.

Coping skills: Life skills for stress & time management; symptoms of anxiety-overcoming anxiety-goal setting and planning.

Module 4 Life skill in different area (12 hours)

Life skill for preventing addiction-life skill for career planning and development-life skill for women empowerment-life skill training for various groups (Adolescents, youth).

References

1. Hurlock B. E. (2007). Developmental Psychology. New Delhi: Tata MC Grew Hill Publishing Co. Ltd.
2. Nelson – Jones R. (2007). Life Counseling Skills. New Delhi: Sage Publishers
3. Rajasenan U. (2010). Life skills, Personality and Leadership. Chennai, RGNIYD
4. UNESCO and Indian National Commission for Cooperation. (2001). Life skills in Non formal Education; A Review. Paris.
5. UNESCO-<http://www.unesco.org>
6. Wadker A. (2016) Life skills for success. Delhi: Sage Publications
7. WHO (1999) Partners In Life Skill Education: Conclusions from a Uninvited Nations Inter - Agency Meeting, Geneva
8. WHO-<http://www.who.int/en>



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Organizational Behaviour

PSY6B05 01 Organizational Behaviour

Module1: Introduction to organisational behaviour

The Concept of Organization – Need and Importance of Organizational Behaviour – Goals- Scope and Challenges of Organization - Organization Structure-Types –Organizational behaviour Models.

Module 2: Individual behaviour (12 hours)

Attitude – Characteristics – Components – Formation of attitude. Perception–Importance – Factors influencing perception – Interpersonal perception- Impression Management. Motivation - Meaning and types of Motivation, content theories and process theories.

Module 3: Group behaviour and leadership (12 hours)

Concept of groups - Basic groups- Theories of group formation. Communication - Processes of communication in organization-Functions of communication. Transactional Analysis. **Leadership- Functions of a leader- Approaches to the study of leadership phenomenon.**

Module 4: dynamics of organizational behaviour (12 hours)

Meaning of conflict - The processes of conflict, Types and sources of conflict, Resolution of conflict.

Meaning of stress- Work stressors - Consequences and management of stress-Balancing work and life.

Organizational development – Characteristics –Objectives – Organizational effectiveness.

References

1. Robbins S. P. (2005) *Essentials of Organizational Behaviour*, 8th ed. New Delhi: Prentice Hall India Pvt. Ltd.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2. Sharma R. A. (2000) *Organizational Theory and Behaviour*, 2nd ed. New Delhi: Tata McGraw Hill Publishing Company Limited.

Psychology and Personal Growth

PSY5D01 Psychology and Personal Growth

Module 1: Introduction to Psychology (10 hours)

Psychology: Definition, goals of psychology, application of psychology in personal and social life
: Branches of psychology

Module 2 : Positive Psychology (14 hours)

Positive Psychology: definition, assumption, and goals. Well-being : Definition, subjective and psychological well-being, eastern and western perspectives of well-being. Hope, Optimism, Mindfulness.

Module 3 : Happiness (14 hours)

Positive emotions and negative affectivity. Happiness : Causes and effects of happiness, Happiness across life span, Gender, Marriage, Money and culture in happiness, Close relationship and happiness.

Module 4 : Methods of personal growth (10 hours)

Stress : Distress and eustress, responses to stress, stress management techniques. Meditation and yoga techniques for enhancing personal effectiveness. Resilience : Definition, Risk, protective factors of resilience, Models of resilience



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Reference

1. Alan Carr (2011). Positive Psychology: The Science of Happiness & Human strengths (II edition). Routledge, London & New York.
2. Baron R.A. (2004). Psychology, 5th ed. New Delhi: Pearson education
3. Carr Alan (2011). Positive Psychology (2nd Edn), New York: Routledge Taylor and Francis Group.
4. Mishra B.K. (2008). Psychology: The study of Human Behavior. New Delhi: Prentice Hall of India
5. Snyder R.C., Lopez J. S., Pedrotti T. J. (2011). Positive psychology: the scientific and practical explorations of human strengths (2nd edition). Sage Publications India Pvt. Ltd, New Delhi.

Additional Reference:

1. Fadiman, James Frager, and Robert. (2002). Personality and Personal Growth (5th Edn) Prentice Hall.

Life Skill Applications

PSY5D02 Life Skill Applications

Module 1 : Introduction 8 hours

Life Skill: Concept, meaning, definition, need, Importance, **Ten core life skills.**

Module 2: Self awareness, Empathy and Problem solving (12 hours)

Self awareness: concept, importance of self awareness, skills to become self aware and benefits of self awareness in real life.

Empathy: Need for empathy, importance of empathy in building relationships, benefits of empathy in real life.

Problem solving: Steps of problem solving, using problem solving skill in solving real life problems

Module 3 :Survival Skills, Effective communication and Negotiating skills (14 hours)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Survival Skills: Interpersonal relations-building of interpersonal relations, skill to improve interpersonal relations

Effective communication: listening skills, verbal and non verbal communications.

Negotiating skills: decision making-importance of effective decision making in real life, career decision making

Essentials Of Geology

GEO1B01 Essentials of Geology

Module 1:

- Definition, scope and branches of Geology.
- Elementary information on the Universe and the Solar system – The Eight Planets; Meteorites; Comets; Asteroids.
- Origin of the Earth – Big-Bang theory; Nebular hypothesis; Planetesimal hypothesis.
- Layered structure of the earth and its major discontinuities.
- Concept of lithospheric plates and plate tectonics

Module 2:

- Age of the Earth – Determination of Earth’s age, Relative and absolute dating. Non-radioactive methods and radioactive methods.
- Geological Time scale: Eons; Eras; Periods; and Epochs
- International stratigraphic time scale

Module 3:

- Nature of crystals; crystalline and amorphous materials; polycrystalline materials; a brief introduction to Crystal systems.
- Morphological characters of crystal – faces, forms, edges solid angles Interfacial angle.
- Building blocks of earth materials – Chemical elements and periodic table; Bonding of atoms – Metallic, Covalent, Ionic and Vander Walls Bonding in Minerals
- A brief introduction to minerals – Silicates – Carbonates – Sulphides –Phosphates.
- **Rocks – Types of rocks - brief introduction to Igneous, sedimentary and metamorphic rocks; Concept of rock cycle**

Module 4:

- **Earthquakes – Properties of seismic waves; Magnitude and Intensity – Richter and**



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Mercalli's Scales; Seismogram and Seismograph. Origin, distribution and prediction of earthquakes. Tsunami – Origin and effects.

- Study of Earth's interior by using seismic waves
- Mass movements – Types of mass wasting. Landslides – causes, effects and remedial measures.

Module 5:

- Volcanoes – Classification based on Lava Types; Styles of Eruptions – Products - Global Distribution; Causes; Effects; Prediction.
- Oceans and Seas: Waves, tides and currents; Geological work of oceans.
- Description of continental margins and ocean bottom topography – Continental shelf, Continental slope, submarine canyons, sea mount, Guyots, Midoceanic ridges, trenches.

Essential Reading:

1. Condie, K.C., 2015. *Earth as an Evolving Planetary System*, 3rd Edition, Academic Press, USA.
2. Marshak, S., 2001. *Earth: Portrait of a Planet*. W.W. Norton & Co., Inc., USA
3. Tarbuck, E.J. and Lutgens, F.K., 2008. *Earth: An Introduction to Physical Geology*. 9th Edition, Pearson Education, Inc., New Jersey, USA
4. Wicander, R. and Monroe, J., 2006. *Essentials of Geology*. 4th Edition, Thomson Learning Inc., USA.

Dynamic Geology and Geoinformatics

GEO2B03 Dynamic Geology and Geoinformatics

Module 1:

- Weathering, erosion and soil – Types of weathering – Physical, Chemical and Biological; Products of weathering; Factors influencing weathering
- Geological work of wind: Erosional and depositional landforms – Loess, types of dunes,pediplanation, playas and inselbergs; Formation of desert landforms
- Glaciers – Formation of glaciers; Types; Accumulation and wastage; Movements;
- Erosional and depositional landforms; Glacial ages

Module 2:

- Running water as a geological agent: Development of a typical Stream-Drainage system; Consequent and subsequent streams; Drainage basin and Drainage patterns; Graded, Braided and Meandering streams



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Geological work of stream, erosional and depositional fluvial landforms
- Concept of base level, peneplanation, monadnocks, Stream terrace, Rejuvenation, Knick Point.

Module 3:

- Underground water: Occurrence, Zone of aeration and saturation; Water table – Perched water table; Porosity, Permeability,
- Aquifers – Confined and unconfined, aquicludes, aquitard and aquifuge. Artesian wells, Geysers and springs. Erosional and depositional landscapes produced by action of ground water; Origin of limestone caverns – Stalactite and stalagmites; Karst topography

Module 4:

- Geoinformatics – Definition.
- Geographic Information System (GIS) – The purpose of GIS; Maps; Components of GIS; GIS software. Types of Data – Raster and Vector.
- Spatial data input – Digitizing paper maps. Geo-referencing. Transformation and Projection. Spatial data analysis; Overlay functions.
- GIS Applications in Geosciences – Geology; Groundwater; Mineral Exploration.

Module 5:

- Remote sensing- basic principles.
- Satellite data products- panchromatic, multispectral, hyperspectral, super spectral.
- Sensors and platforms- type, sensor parameters- spatial, spectral, radiometric, temporal resolution.

Essential Reading:

1. Lo, C.P. and Yeung, A.K.W., 2007. *Concepts and Techniques in Geographic Information Systems*.
2. Tarbuck, E.J. and Lutgens, F.K., 2008. *Earth: An Introduction to Physical Geology*. 9th Edition, Pearson Education, Inc., New Jersey, USA.
3. Wicander, R. and Monroe, J., 2006. *Essentials of Geology*. 4th Edition, Thomson Learning Inc., USA.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Crystallography and Mineralogy

GEO3B05 Crystallography and Mineralogy

Module 1:

- Crystallography – A brief introduction to scope and its applications.
- Symmetry elements – crystallographic axes, crystal notation, parameter system of Weiss and Miller indices, axial ratio.
- Laws of crystallography – law of constancy of symmetry, law of constancy of interfacial angles, law of rational indices.
- Classification of crystals into systems and classes – Holohedral, Hemihedral, Hemimorphic and Enantiomorphic forms in crystals.

Module 2:

- Study of the symmetry elements and forms of the Normal, pyritohedral, tetrahedral and plagiohedral classes of cubic system with special reference to well-developed crystals of Galena, Spinel, Garnet, Fluorite, Diamond, Pyrite, Tetrahedrite, Boracite and cuprite.
- Study of symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Sphenoidal and Trapezohedral classes of Tetragonal system.
- Study of the symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Trapezohedral, Rhombohedral, Rhombohedral Hemimorphic and Trapezohedral classes of Hexagonal system.

Module 3:

- Study of the symmetry elements and forms of the Normal and Sphenoidal classes of Orthorhombic system.
- Study of the symmetry elements and forms of the Normal classes of the Monoclinic and Triclinic systems.
- Twin crystals – Definitions – Effects of Twinning – laws of twinning – composition plane, twinning plane and twinning axis, indices of twins – simple and repeated (polysynthetic twins), contact and penetration twins: secondary twins.

Module 4:

- Definition of Mineral and Mineraloid – Scope and aim of Mineralogy.
- Crystal Coordination - the making of minerals
- Classification and structural diversity of silicate minerals

Module 5:

- Compositional variation and coupled ionic substitution, Isomorphism, Polymorphism,



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Pseudomorphism, solid solution and ex- solution in minerals.

- Physical properties of minerals Form, Colour, streak, luster, Hardness, Cleavage, Fracture, Specific Gravity, Tenacity, transparency, Electrical and Magnetic properties- pyro and piezo electricity, Ferri-, Para-, and Diamagnetism.

Essential Reading:

- Borchardt-Ott, W., 2011. *Crystallography– An Introduction*. Springer Heidelberg, 355p.
- Dana, F.S., 1955. *A Text Book of Mineralogy*. Asia publishing House, Wiley.
- Klen, C., Hurlbut, C.S., 1985. *Manual of Mineralogy*, John Wiley & Sons
- Perkins, D., 2015. *Mineralogy*. Pearson Education (3Ed), 568 p.

Optical and Descriptive Mineralogy

GEO4B07 Optical and Descriptive Mineralogy

Module 1:

- Nature of light – Ordinary and polarized light; Refraction and reflection; Refractive index, Critical angle and Total internal reflection.
- Double refraction – Plane Polarization by Reflection; Plane polarization by Refraction; Nicol Prism; Plane polarization by absorption.
- Petrological microscope and its parts
- Isotropic and anisotropic minerals - Optical properties.

Module 2:

- Characters of Uniaxial and biaxial minerals – Optic axis and optic axial angle; Acute and Obtuse Bisectrix; Optic sign of Uniaxial and Biaxial minerals; Uniaxial and Biaxial Indicatrix; Sign of elongation.
- Extinction – Types, angles, determination, and applications in mineral identification.
- Optical accessories and uses – Quartz wedge (Determination of order of Interference Colour), Gypsum plate and Mica plate (Determination of Fast and Slow vibration directions).

Module 3:

- Structure, Chemistry, Optical and Physical properties, Modes of occurrence and uses of the following groups of minerals: Olivine, Garnet, Epidote, Aluminium silicates, Pyroxene, and Amphibole.

Module 4:



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- Structure, Chemistry, Optical and Physical properties, Modes of occurrence and uses of the following groups of minerals: Mica, Chlorite, Polymorph and varieties of Quartz, Feldspars, Feldspathoids and Spinel.

Module 5:

- Chemistry, Optical and Physical properties, Modes of occurrences and industrial uses of the following minerals: Scapolite, Cordierite, Talc, Serpentine, Steatite, Calcite, Dolomite, Topaz, Staurolite, Beryl, Tourmaline, Fluorite, Apatite, Zircon, Rutile, Spene, Zeolites and Corundum.

Essential Reading:

1. Dyar, M.D., Gunter, M.E., 2007. *Mineralogy and Optical Mineralogy*. Min. Soc. America, 705p.
2. Demange, M., 2012. *Mineralogy for Petrologists: Optics, Chemistry, and Occurrence of Rock-Forming Minerals*. CRC Press (Taylor & Francis Group), 182 p.
3. Nesse, W.D., 2012. *Introduction to Optical Mineralogy*. Oxford University Press; 4 edition, 384p.
4. Pichler, H., Riegraf, C.S., 2011. *Rock-forming Minerals in Thin Section*. Springer, 220 p.
5. Deer, W.A., Howie, R.A., Zussman, J., 2013. *Introduction to the Rock-forming Minerals*. Mineralogical Society of Great Britain & Ireland, 510 p.

Structural Geology and Geotectonic

GEO5B09 – Structural Geology and Geotectonic

Module 1:

- Introduction to Structural Geology. Methods for representing relief features; contours, topographic and geologic maps- their preparation and uses, geological surface and their attitudes-Dip and strike- trend of outcrops - rules of 'V' – relation between true dip and apparent dip-width of outcrops; true thickness and vertical thickness and their mutual relation. Uses of clinometers and Brunton compass.
- Rock deformation-uniform pressure- differential pressure- stress and strain, types of stress-type of strain -stress strain diagram. Stages of deformation, mechanism of elastic, plastic and brittle deformation

Module 2:

- Folds: Geometry and elements of folded surface-classification- descriptive study of different types of folds- recognition in the field and on the maps.



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- Shear Zones – Shear sense indicators – prominent shear zones of southern India
- Fault: Definition, terminology, classification, description and recognition in the field and on the map

Module 3:

- Joints: Definition, classification, descriptive study and geological significance of joints.
- Foliation and lineation- primary and secondary and their types.
- Unconformities: Definition, and types, significance and recognition in the field and on the maps. Overlaps and offlaps, outlier and inlier.
- Introduction to equal area and stereographic projections; methods of construction; Pie Diagram, contour diagram, Beta diagram.

Module 4:

- Structure and characteristics of layers of the Earth: Crust (Continental and Oceanic), Mantle (Lower and Upper), Core (Inner and Outer);
- Geophysical and petrochemical characteristics of Lithosphere and Asthenosphere
- Mantle petrology and chemical composition; Models of mantle convection
- Mantle plumes; Hot spots; Super swells

Module 5:

- Continental Drift; Seafloor spreading; Palaeomagnetism
- Plate tectonics: Basic concepts and definition. Types of plate margins.
- Features associated with divergent, convergent, and transform plate margins.
- Triple junctions, Benioff zones, Island arcs, rift valleys, transform faults

Essential Reading:

1. Condie, K.C., 2011. *Earth as an Evolving Planetary System*, Academic Press, Oxford, UK, 574p.
2. Frisch, W., Meschede, M., and Blakey, R., 2011. *Plate Tectonics – Continental Drift and Mountain Building*, Springer-Verlag, Berlin Heidelberg, 212p.
3. Moores, E.M., Twiss, R.J., 2014. *Tectonics*. W.H. Freeman, 672 p.
4. Turcotte, D.L. and Schubert, G., 2014. *Geodynamics*, Cambridge University Press, 636p.
5. Twiss, R.J., Moores, E.M., 2007. *Structural Geology*. W.H. Freeman, 500p.



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Stratigraphy and Sedimentology

GEO5B10 Stratigraphy and Sedimentology

Module 1:

- Laws of Stratigraphy: Concept of uniformitarianism; Law of order of super position; Law of faunal succession; Law of original horizontality; Principle of Lateral Continuity; Principle of Inclusion; Law of cross cutting relationship
- Physical and biological criteria of correlation and homotaxis.
- Major events of Mass extinction

Module 2:

- Facies and facial changes-litho and bio facies- break in stratigraphic records - diastems.
- Stratigraphic classification
- Biostratigraphic classification- Biozones, biohorizon, index fossil.
- Range zone- Taxon range zone concurrent range zone, interval zone, assemblage zone, Acme zone.
- Lithostratigraphic classification Group, Formation, Member, Bed.
- Chronostratigraphic classification- Eonothem, erathem, system, series, stage.

Module 3:

- Sedimentary process: disintegration & decomposition of rocks – transportation – deposition – diagenesis.
- A broad classification of sedimentary rocks
- Structures of sedimentary rocks-mechanical, chemical and organic structures.
- Textures of sedimentary rocks – clastic and non – clastic textures
- Brief introduction to Depositional environments – terrestrial, marine and transitional

Module 4:

- Mechanical deposits – rudaceous, arenaceous and argillaceous groups
- Chemical deposits – siliceous, carbonaceous, ferruginous and salt deposits
- Organic deposits – calcareous, siliceous, phosphatic, and carbonaceous deposits.
- Residual deposits – terra rossa, clay, laterite and bauxite and soils.

Module 5:

- A descriptive study of Conglomerate, Breccia, Sandstones and Shales
- Heavy minerals
- A brief study of Flint, Chert, Limestone, Dolomite, Gypsum, Rock Salt, Siderite
- A brief study of fossiliferous limestone, radiolarian chert, diatomaceous earth, Guano
- Descriptive study of different types of carbonaceous deposits.



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- Introduction to major Quaternary sedimentary deposits of India, tectonics and sea-level changes.

Essential Reading:

1. Boggs, S., 2016. *Principles of Sedimentology and Stratigraphy*. Pearson Education. 568 p.
2. Brookfield, M.E., 2003. *Principles of Stratigraphy*. Wiley-Blackwell, 340 p.
3. Nichols, G., 2016. *Sedimentology and Stratigraphy*. Wiley-Blackwell, 419 p.
4. Prothero, D.R., Schwab, F., 2013. *Sedimentary Geology*. W.H. Freeman, 593 p.

Igneous Petrology

GEO5B11 Igneous Petrology

Module 1:

- Composition and constitution of magmas – Primary and Parental Magmas.
- Forms of Intrusive igneous rocks: Concordant forms - Sill, Laccolith, Lopolith and Phacolith, Discordant forms - Dykes, Cone Sheets, Volcanic neck, Ring dyke, Batholiths, Stocks, Bosses and bysmaliths.
- Forms of Extrusive igneous rocks: Lava flows, Pyroclastic deposits - Agglomerate, Lapilli, volcanic ash and volcanic froth.

Module 2:

- Structures vesicular and Amygdaloidal structures – block lava – Ropy lava – pillow structure – flow structure – sheet joints- mural jointing – columnar jointing – rift and grain.
- Textures: Definition and description - crystallinity: crystallites and microlites – Devitrification – Granularity – shapes of crystals, mutual relations – Equigranular textures: allotriomorphic hypidimorphic, Panidiomorphic. inequigranular Textures: porphyritic and Intergrowth texture – Trachytic texture – Intergrowth texture structures orbicular structure Spherulitic structure – Perlitic fracture. , Directive textures, Overgrowth textures, Reaction textures - Micro Structures

Module 3:

- Classification: bases of classification – Genetic classification – classification based on colour index – based on the proportion of Alkali to plagioclase feldspars-based on silica saturation – based on alumina saturation –
- A short account of CIPW classification , Normative minerals, salic and femic groups – Merits and defects of CIPW classification



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- Tyrrel’s tabular classification- IUGS classification.

Module 4:

- Crystallization of Unicomponent magma
- Crystallization and petrogenetic significance of Binary magmas: Diopside – Anorthite Eutectic system, Albite – Anorthite Solid-Solution system, Forsterite – Silica incongruent melting system and Ternary system (Ab–An– Di).
- Reaction principle and Bowen’s reaction series - Causes for the diversity of Igneous rocks – Magmatic Differentiation: Fractional Crystallization, Liquid immiscibility, Assimilation - Short notes on: Consanguinity, Variation diagrams and petrographic provinces.

Module 5:

- Study of Texture, Mineralogy, Classification, and Modes of occurrence of Granite, Granodiorite, Syenite, Diorite, Gabbro with their hypabyssal and volcanic equivalents.
- Petrographic characters and origin of Pegmatites, Lamprophyres, Alkaline rocks, Dunite, Peridotite and Anorthosites

Essential Reading:

1. Frost, B.R., Frost, C.D., 2014. *Essentials of Igneous and Metamorphic Petrology*. Cambridge University Pres. 318 p.
2. Raymond, L.A., 2002. *Petrology: The Study of Igneous, Sedimentary and Metamorphic Rocks*, 720p.
3. Winter, J.D., 2009. *Principles of Igneous and Metamorphic Petrology*. Pearson, 720 p.



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Metamorphic Petrology

GEO5B12 – Metamorphic Petrology

Module 1:

- Metamorphism – Definition; limits of metamorphism (low and high *T/P* limits and influence of water and bulk compositions on metamorphic limits).
- Variables of metamorphism – temperature, lithostatic pressure, deviatoric stress, fluids.
- Types of metamorphism – classification based on the principal agents (thermal, dynamic, dynamo-thermal, hydrothermal); based on geological setting – contact, shock, high-strain, regional (burial, ocean-ridge, orogenic); based on plate tectonic setting – metamorphism at convergent, divergent, and transform plate margins.
- Fault-zone and impact metamorphism

Module 2:

- Classification of metamorphic rocks: foliated and lineated; non-foliated and non-lineated; specific rock groups (Quartzite, Greenstone, Amphibolite, Serpentinite, Calc-silicate, Skarn)
- Metamorphic structures – fabric, layer, foliation, schistosity, cleavage, gneissosity, lineations.
- Metamorphic textures – augen, cataclastic, corona, decussate, epitaxial, flaser, granoblastic, lepidoblastic, megacrystic, nematoblastic, poikiloblastic, porphyroblastic, strain shadow, symplectite, and relict textures.
- Equilibrium mineral assemblages; Introduction to chemographic diagrams: ACF, AKF Diagrams

Module 3:

- Metamorphic grades and isograds; mineral zones and Barrovian sequence;
- Metamorphic facies – zeolite, prehnite-pumpellyite, greenschist, epidote-amphibolite, amphibolite, granulite, blueschist, eclogite, and contact metamorphic facies
- Facies series and plate tectonics – paired metamorphic belts.

Module 4:

- Metamorphic effects on – argillaceous (medium *P-T* Barrovian); calcareous (contact metamorphism); basic igneous (regional metamorphism) rocks
- Petrography and origin of slate, phyllite, chlorite schist, kyanite schist, biotite schist, biotite gneiss, bornblende gneiss, amphibolite, marble, charnockite, eclogite, and mylonite

Module 5:

- Prograde and retrograde metamorphism
- Nature of metamorphic fluids and metasomatism



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- Introduction to UHP and UHT metamorphism; anatexis and migmatites; metamorphic differentiation

Essential Reading:

1. Barker, A.J., 1990. *Introduction to Metamorphic Textures and Microstructures*. Blackie, 162p.
2. Bucher, K. and Grapes, R., 2011. *Petrogenesis of Metamorphic Rocks*. Springer-Verlag, Berlin-Heidelberg, 428p.
3. Frost, C.D., Frost, B.R., 2013. *Essentials of Igneous and Metamorphic Petrology*, Cambridge University Press, 336p.
4. Kretz, R., 1994. *Metamorphic Crystallization*. John Wiley & Sons, 507p.
5. Miyashiro, A., 1978. *Metamorphism and Metamorphic Belts*. 3rd Edition. George Allen & Unwin, London, 492p.
6. Vernon, R.H. and Clarke, G.L., 2008. *Principles of Metamorphic Petrology*. Cambridge University Press, 446p.
7. Winter, J.D., 2011. *Principles of Igneous and Metamorphic Petrology*, Prentice-Hall, 728p.

Paleontology

GEO6B17 Paleontology

Module 1:

- An outline of life through ages, its evolution and distribution
- Definition of Palaeontology – organic world – classification – Flora and Fauna – vertebrates and invertebrates
- Definition of fossils – nature and modes of preservation of fossils: Unaltered hard parts: Altered hard parts : Petrification, permineralisation, carbonisation, recrystallisation, silicification , mould, casts, tracks , trails, borings,
- Uses of fossils – stratigraphic indicators – climatic indicators- indicators of palaeogeography – indicators of evolution and migration of life forms – indicators of new deposits of coal and petroleum

Module 2:

- Phylum protozoa – Order: Foraminifera: General morphology – chitinous test – septa, arrangement of chambers, suture, aperture, dimorphism – classification, geological



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history and stratigraphic importance.

- Phylum coelenterata – class Anthozoa – zoological features – General morphology: corallum, corallite , theca , chambers, septa, fossula, columella, septal developments, classification – tabulate corals – Rugose corals evolution geological distribution – stratigraphic importance.
- Sub phylum Hemichordata – class Graptozoa: order Dendroidea and Graptoloidea – general morphology , rhabdosome, stipe , theca , common canal , nema , virgula , sricula , angle of divergence, central disc, uniserial, biserial, classification, geological distribution and stratigraphic importance

Module 3:

- Phylum mollusca: Class Pelecypoda:- General characters – umbo, Hinge line – ligament – lunule and escutcheon – adductor impressions, pallial line, pallial sinus, dental patterns, ornamentation, classification, geological history
- Class Gastropoda:- General morphology, shell forms, whorl, spire, spiral angle, suture, aperture, columella, umbilicus , peristome , aperture , (Holostomatus and siphonostomatus) – types of coiling – Dextral and sinistral – ornamentation , classification and geological history
- Class Cephalopoda:- General morphology , siphuncle, septa, septal necks, connecting rings, chambers, suture lines, (Nautilitic , Goniotitic , Ceratitic and Ammonitic) – shell forms – ornamentation – classification evolution, geological history- morphology of a Belemnite shell.

Module 4:

- Phylum Brachiopoda:- General morphology, umbo, hinge line , pedicle opening, delthyrium, deltidium pseudo deltidium – Brachial skeleton – morphometric details, ornamentation , classification , geological history.
- Phylum Echinodermata: - Class Echinoidea:- General morphology, periproct, apical system (Anus, ocular plates, Genetal plates, madriporic plates), corona (Ambulacra , inter ambulacra) – peristome – Regular and irregular echinoids – classification – geological history. Class crinoidea:- General morphology , calyx , dorsal cup, (Radicals , basals, intrabasals), arms, stem, classification, geological history. Class Blastoidea: - General morphology – calyx, dorsal cup (Basals, radials, deltoids, ambulacra). Brachioles, cicatrix, geological history

Module 5:

- Phylum Arthropoda:- Class – Trilobita- General morphology : Cephalon: glabella, facial suture, free cheek, fixed cheek, genal angle , genal spine , cranadium; thorax – pygidium – classification – geological history.
- Brief account of Siwalik vertebrate fossils



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- General classification of plant kingdom – plant fossils from India – A brief account of the following plant fossils :- Glossopteris , Gangamopteris , Ptilophyllum , Calamites , Lepididendron and Sigillaria

Essential Readings:

1. Henry woods : Invertebrate palaeontology – Cambridge.
2. Romer , A.S.: Vertebrate palaeontology, Chicago press.
3. Arnold, C.A., An introduction to Palaeobotany., MC-Graw Hill.
4. B.U. Haq and A. Boersma (1978) Introduction to marine Micropalaeontology. Elsevier, Netherlands
5. Raup, D.M. and Stanely, M.S.: Principles of Palaeontology, CBS Publishers.
6. Moore , R.C., Laliker , C.G.& Fishcher, A.G.: Invertebrate Fossils , Harper brothers
7. Shrock. R.R. and Twenhofel , W.H – 1953 : Principles of invertebrate Palaeontology, Amold publication

Indian Geology

GEO6B18 Indian Geology

Module 1:

- Early Precambrian Stratigraphy: Sargur supracrustals; Granulite blocks of southern India; Dharwar Supergroup; Aravalli Supergroup
- Late Precambrian Stratigraphy: Delhi Supergroup, Cudappah Supergroup, Vindhyan Supergroup. Brief study of Singhbhum craton, Sausar and Sakoli group

Module 2:

- Paleozoic Stratigraphy: Distribution of Paleozoic rocks in India; Cambrian of Salt Range; Age of Saline Series; Upper Carboniferous and Permian rocks of Salt Range; Paleozoic rocks of Kashmir Valley; Paleozoic rocks of Spiti Valley; Paleozoic rocks of Peninsular India

Module 3:

- Mesozoic Stratigraphy: The Depositional Environment–distribution–life–classification and economic importance of Gondwana formations of India, Coastal Gondwana of India, Gondwana formations of Tamil Nadu, Triassic of Spiti – The Lilang System, Jurassic of Kutch, Cretaceous of Tiruchirapalli – Pondicherry – Bagh Beds, **Deccan traps: distribution, structure, Lameta beds – infratrapean and intertrapean beds**, age of the Deccan traps



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Module 4:

- Cenozoic Stratigraphy: Comprehensive account of the geological events took place during Cenozoic Era in India, rise of Himalayas, stratigraphy of Siwalik system, fauna and flora of Siwaliks, Tertiary rocks of Assam, Karewa formation, Tertiary rocks of Tamil Nadu, Tertiary rocks of Kerala, Pleistocene Glaciation – **Cenozoic oil bearing formations of India**

Essential Reading:

1. Sharma, R.S., 2009. *Cratons and Fold Belts of India*. Springer.
2. Krishnan M.S. (2003)- *Geology of India and Burma*, 6th Edition, CBS.
3. Wadia D.N. (1953) – *Geology of India*, TATA McGraw – Hill.
4. Pascoe, E.H.(1968) - *A manual of the Geology India and Burma*, Govt of India Publications.
5. GSI publications, Bangalore. *Geology of India Vol 1 &2*, 2008

Economic Geology

GEO6B19 Economic Geology

Module 1:

- Historical development of economic Geology. Geochemical distribution of elements.
- Materials of mineral deposits – ore minerals, gangue minerals, tenor and grade of ores, ore shoots and bonanzas.
- Brief study of metallogenic epochs and provinces – geologic thermometers.
- Classification of mineral deposits. Outline of Lindgren’s and Bateman’s classification- Syngenetic and epigenetic deposits.
- Controls of ore localization – structural, stratigraphic, physical and chemical.

Module 2:

- Magmatic processes – mode of formation – Early magmatic processes and deposits, disseminations, segregations and injections – Late magmatic processes and deposits – Residual liquid segregation and injection – immiscible liquid segregation and injection – sublimation.
- Metamorphic processes – Formation of Graphite, Asbestos, Talc, Soapstone and Sillimanite group of minerals

Module 3:



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- Contact Metasomatic processes – the process and effects – resulting mineral deposits. Hydrothermal processes – principles – Factors affecting deposition – wall rock alteration – minerals sequence – cavity filling deposits Fissure veins, shear – zone, stock-work, saddle reef, ladder vein, fold cracks, breccia filling, solution cavities, pore space and vesicular filling – replacement deposits- process and deposits – criteria of replacement.
- Sedimentary processes and cycles – principles involved in sedimentation – cycles of Iron and manganese, weathering processes – principles- Residual concentration process and deposits – mechanical concentration principles – eluvial, alluvial, beach and eolian placers. Oxidation and supergene sulphide enrichment – solution and deposition in the zone of oxidation – secondary sulphide enrichment – Gossans and capping.

Module 4:

- Occurrence and distribution in India of metalliferous deposits - base metals, iron, manganese, aluminium, chromium, nickel, gold, silver, molybdenum.
- Indian deposits of non-metals – Diamond, mica, asbestos, barytes, gypsum, graphite, apatite and beryl. Gemstones, refractory minerals, abrasives and minerals used in glass, fertilizer, paint, ceramic and cement industries.

Module 5:

- Coal and its properties: Different varieties and ranks of coal. Origin of coal. Geology and coal petrography of different coalfields of India.
- Origin, migration and entrapment of natural hydrocarbons. Characters of source and reservoir rocks. Structural, stratigraphic and mixed traps. Geographical and geological distributions of onshore and offshore petroliferous basins of India.

Essential Reading:

1. Pohl, W.L., 2016. *Economic Geology Principles and Practice*. Wiley-Blackwell, 678 p.
2. Sarkar, S.C., Gupta, A., 2012. *Crustal Evolution and Metallogeny in India*. Cambridge University Press, 912 p.

Crystallography

GEO3B06(P) Crystallography

- Download and install QGIS software
- Scanning of paper maps / toposheets
- Georeferencing
- Digitisation of points, lines and polygons



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- Adding attribute data
- Calculation of length and area of features
- Preparation of map layouts
- Record of the practical done

Structural Geology

GEO5B13(P) Structural Geology

Megascopic identification:

- Megascopic identification and description of the following: Quartz, smoky quartz, milky Quartz, Rosy quartz, Amethyst, Chalcedony, Agate, Flint, Jasper, Chert, Opal, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Sodalite, Enstatite, Bronzite, Hypersthene, Diopside, Augite, Spodumene, Acmite, Rhodonite, Wollastonite, Anthophyllite, Tremolite, Actinolite, Hornblende, Olivine, Serpentine, Muscovite, Biotite, Vermiculite, Phlogpite, Chlorite, Epidote, Garnet, Natrolite, Stilbite, Apophyllite, Talc, Steatite, Andalusite, Kyanite, Sillimanite, Staurolite, Cordierite, Apatite, Beryl, Topaz, Calcite, Dolomite, Tourmaline, Zircon, Fluorite.

Microscopic identification:

- Megascopic identification and description of the following: Quartz, smoky quartz, milky Quartz, Rosy quartz, Amethyst, Chalcedony, Agate, Flint, Jasper, Chert, Opal, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Sodalite, Enstatite, Bronzite, Hypersthene, Diopside, Augite, Spodumene, Acmite, Rhodonite, Wollastonite, Anthophyllite, Tremolite, Actinolite, Hornblende, Olivine, Serpentine, Muscovite, Biotite, Vermiculite, Phlogpite, Chlorite, Epidote, Garnet, Natrolite, Stilbite, Apophyllite, Talc, Steatite, Andalusite, Kyanite, Sillimanite, Staurolite, Cordierite, Apatite, Beryl, Topaz, Calcite, Dolomite, Tourmaline, Zircon, Fluorite.

GIS Practicals:

- Toposheet search, UTM Zones, Coordinates
- Latitude and Longitude converter
- Georeferencing
- Digitisation of Point, Line and Polygon features
- Calculation of length and area
- Making of map layout



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Record preparation

*This course will include the practical component of the course GEO1B02(P) – Field Geology, GEO2B04(P) – Geoinformatics and GL3B06(P) – Crystallography.

Petrology

GEO5B15(P) Petrology

Megascopic identification and description of the following rocks:

- Granite, Graphic granite, Pegmatite, Aplite, Granite Porphyry, Syenite, Syenite porphyry, Diorite, Gabbro, Anorthosite, Dunite, Pyroxenite, Dolerite, Basalt, Rhyolite, Felsites, Obsidian, Pumice, Scoria.
- Slate, Phyllite, Schists, Gneisses, Quartzite, Marble, Amphibolite, Eclogite, Leptynite, Charnockite, Khondalite, Schorl rock, Banded Magnetite Quartzite
- Conglomerate, Breccia, Sandstone, Arkose, Shale, Limestone, Laterite, Chert, Grit, Lignite.

Microscopic identification and description of the following rocks:

- Mica Granite, Hornblende Granite, Graphic Granite, Syenite, Nepheline Syenite, Diorite, Gabbro, Dunite, Peridotite, Granite porphyry, Diorite, Dolerite, Anorthosite, Basalt.
- Slate, Chlorite schist, Mica schist, Kyanite schist, Charnockite, Eclogite, Amphibolite, Khondalite, Augen Gneiss, Garnet Biotite Gneiss,
- Conglomerate, Breccia, Sandstone, Arkose, Shell limestone.

Structural and Economic Geology

GEO6B20(P) Structural and Economic Geology

Megascopic identification and description of Indian occurrences & uses of the following ore and industrial Minerals: -

- Sulphides: Realgar, Orpiment, Stibnite, Molybdenite, Galena, Sphalerite, Chalcophyrite, Pyrite, Arsenopyrite, Marcasite.



CRITERION	I	Curricular Aspects
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- Sulphates: Barite, Celestite, Gypsum,
- Oxides: Cuprite, Corundum, Hematite, Ilmenite, Magnetite, Chromite, Cassiterite, Rutile, Pyrolusite, Psilomelane, Goethite, Limonite, Bauxite,
- Carbonates: Calcite, Dolomite, Magnesite, Siderite, Aragonite, Witherite, Strontianite, Cerussite, Azurite, Malachite.
- Industrial Minerals: Halite, Fluorite, Phosphatic Nodule, Monazite, Graphite, Coal and its varieties, Asbestos.

Record preparation

*This course will include the practical component of the course GEO5B13(P) – Structural Geology.

Environmental Geology

GEO6B22(EO1) Environmental Geology

Module 1:

- Our place in the environment-humans as agents of geologic change-fundamental concepts of environmental geology. Man as a geologic agent- deforestation- human population explosion-urbanization

Module 2:

- Man and geologic hazards-mass wasting and its human impacts-factors that influence slope stability- earth quakes hazards and risks- prediction and control of earth quakes

Module 3:

- Man and hydrosphere- pollution of surface water-pollution of ground water-saline water intrusion- pollution in the marine environment

Module 4:

- Man and atmosphere- atmospheric change as a natural process-anthropogenic impacts on the atmosphere- depletion of ozone-global warming- green house effect

Module 5:

- The global energy scenario- energy from fossil fuels- energy alternatives-environmental



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impacts of mining-waste management

Essential Reading:

1. Donald R coates, Ed 1973 Environmental Geomorphology and Environmental geo science. Willey international
2. Donald R coates, 1981, Environmental geology, John wiley and sons
3. Peter T Elawan ,1970. Environmental geology, Harper & Raw

Understanding the Earth

GEO5D01 Understanding the Earth

Module 1:

- Earth – Structure and composition – Layers, discontinuities and their properties.
- Types of rocks - brief introduction to Igneous, sedimentary and metamorphic rocks;
Concept of rock cycle.

Module 2:

- Continental drift; sea floor spreading and evolution of plate tectonic theory.
- Different kinds of plate margins; Convergent-divergent-transform;
- Evidences and significance plate motion.

Module 3:

- Oceans – their distribution.
- Ocean bottom topography- mid ocean ridges; guyots; seamount; trenches; submarine canyons; continental rise; continental slope; continental shelf.
- Coastal landforms. Geological work of Oceans

Module 4:

- Natural hazards – Earthquake- seismology; focus and epicenter; different kinds of seismic waves; intensity; magnitude; Richter scale; Seismograph and seismogram;



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- Volcanoes – classification; eruption style; products;
- Seismic and volcanic belts of the world. Tsunami.
- Landslide – Mass wasting- types, causes and prevention

Module 5:

- Earth processes: Geological agents – wind; running water; glaciers and work – erosional and depositional features.
- Weathering and soil formation

Essential Reading:

1. Plumer, Carlson, Mc Geary(2003), Physical geology, published by Mc Graw -Hill
2. Bloom,A, Geomorphology,CBS, New Delhi
3. Ahamed, E. Coastal geomorphology of india. Orient long man, New Delhi, 1972
4. Thornbury .W.D Principles of geomorphology, Wiley 1968

Ground Water Exploration and Management

GEO5D03 Ground Water Exploration and Management

Credits: 3

Module 1:

- Origin- meteoritic, juvenile and connate waters. Hydrological cycle, occurrence; ground water occurrences in igneous, sedimentary and metamorphic rocks- vertical distribution of ground water, movement; classification and types of aquifers, definition of porosity, permeability, specific yield, specific retention, storage and transmissibility

Module 2:

- Groundwater detection; surface methods-geomorphological, structural and biological evidences. Surface geophysical methods; principles, field procedures, electrode arrangements, instruments and interpretations involved in electrical resistivity method of ground water exploration. Brief account of role of remote sensing in ground water targeting

Module 3:

- Well design and well development; brief introduction about dug wells, tube wells, jetted wells, infiltration galleries and collector wells, well screening and artificial packing. Well



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development through surging and acidizing. Methodology and need for pump test

Module 4:

- Water quality; Quality of water in various rock types, water quality parameters and their standards proposed by WHO and BIS. Physical parameters of water quality. Chemical parameters and determining methods. Diseases and virological aspects of ground water and remedial measures

Module 5:

- Ground water management; meaning of water shed and river basins. Ground water provinces of india. Ground water potentiality in Kerala. Seawater intrusions and remedies. Cloud seeding, artificial recharge and ground water harvesting techniques

Essential Reading:

1. Davis S.N and Dewiest(1966)-Hydrogeology, John wiley and sons.
2. Bouwer . H. Ground water hydrology,1978
3. Todd,D,K. ground water hydrology,John wiley and sons 1980
4. Tolman C. F, Ground water,Mc Graw Hill
5. Walton,W.C., Ground water resource evaluation, Mc Graw Hill,1970

Fundamentals of Ecology and Environment

ES1C01 Fundamentals of Ecology and Environment

Module I: Fundamentals of Environmental Science- Definition, Scope and Importance of Environmental Science; Multidisciplinary nature of environmental Science; Need of Environmental awareness; Ecology, Interrelationship of ecology with other disciplines.

Module II: Components of the Environment:

- a). The atmosphere or the air: Layers of Atmosphere, Composition of air; importance of atmosphere, meteorological conditions and air circulation.
- b). The hydrosphere or water: Importance of water, distribution of water at global, national and state level. Hydrological cycle.
- c). Lithosphere or the rock and the soil: Elementary composition of rocks in the earth crust. Types of rocks; Process of soil formation: Physical weathering, Chemical and biological weathering of rocks; Role of soil in shaping the biosphere.



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Module III: Environmental Factors (a) Climatic Factors - Light, Temperature of Air (atmospheric temperature), Rainfall (precipitation), Humidity of air, atmosphere (gases and wind), fire. (b) Topographic Factors: height of mountains, direction of mountains and valleys, steepness of slope and exposure of slope (c) Edaphic factors: Soil-soil formation, soil profile, soil erosion, soil conservation (d) Biotic factors: Intraspecific interactions; Interspecific interactions: Neutralism, Commensalism, Mutualism, Proto co-operation, Parasitism, Predation.

Module IV: Ecosystem Definition; Components of ecosystem; Abiotic components: Light, Temperature, Pressure, Water, Wind, Soil; Biotic components; Energy flow in an ecosystem: Primary production, Secondary production; Food chain: Grazing food chain, Detritus food chain; Ecological pyramids: Pyramid of number, Pyramid of biomass, Pyramid of energy; Food web; Ecological indicators. Biogeochemical cycles: a) Gaseous cycles: Oxygen cycle, Carbon cycle and Nitrogen cycle. b) Sedimentary cycles: Phosphorus cycle, Sulphur cycle.

Module V: Population Ecology and Community Ecology: Population characteristics - Population growth and its dynamics; natality, mortality, growth patterns; Age distribution, Malthus theory; Community structure, Species diversity, Ecological dominance, Ecotone, Edge effect, Ecological equivalence, Succession and Climax; Ecological adaptations.

Suggested readings:

1. Odum, E. P. (1971), Fundamentals of Ecology, W B Saunders Company, Philadelphia.
2. Odum, E. P. and Barrett, G. W. (2005), Fundamentals of Ecology, Belmont, CA: Thomson Brooks/Cole.
3. Krebs, C. J. (1989), Ecological methodology, Harper Collins Pub. New York.
4. Robert, L. S. (1990), Ecology and Field Biology, Harper Collins Pub, New York.
5. Michael, P. (1990). Ecological methods for laboratory and Field Investigations, Tata McGraw Hill Publishing Company Limited, New Delhi.
6. Chapman, J. L. and Reiss, M. J. (1992), Ecology-Principles and Applications, Cambridge University Press, Cambridge.
7. Brewer, R. (1994). The Science of Ecology, Saunders College Publishing, New York.
8. Mukherjee, B. (1996), Environmental Biology, Tata McGraw- Hill Pub. Co. Ltd, New Delhi
9. Colin, R., Townsend, Michael, B. and John, L. H. (2012), Essentials of Ecology, third Edn, Blackwell publishing.
10. Singh, J.S., Singh, S.P. and Gupta, S.R. (2008), Ecology, Environment & Resource Conservation, Anamaya Publications.



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Physical processes in the environment

ES1C02 Physical processes in the environment

Module I: Sun-Earth System: planetary motion and seasons; Solar radiation - global distribution, effect of atmosphere - scattering, absorption and reflection, greenhouse effect; Structure of atmosphere and atmospheric circulation; General circulation of the atmosphere and Indian monsoons; General circulation of Oceans; Winds and surface circulation, causes of ocean currents, characteristics of convergence, divergence, upwelling and sinking of ocean waters; Deep-sea circulation, Thermohaline conveyor belt.

Module II: Thermodynamics, Atmospheric stability: Composition of dry air and atmospheric water vapor content; Potential temperature, virtual temperature, isothermal and adiabatic processes; Stable, unstable and neutral equilibriums, Inversions; Atmospheric boundary layer - depth, structure, diurnal variations and their significance in pollutant dispersion.

Module III: Clouds and precipitation: Cloud formation and classification, aerosols, condensation and ice nuclei, droplet growth - curvature and solute effects, precipitation mechanisms; Weather and climate - Climatic zones, continental & maritime climates; Climate change and variability, Natural and anthropogenic causes of climate change, El Nino and ENSO events.

Module IV: Earth Systems: Earth's geological history and development and evolution of the earth systems; Gaia Hypothesis; Introductions to various systems - Atmosphere, Hydrosphere, Lithosphere, Biosphere and their linkages, types of ecosystems. Properties and Structure of the Earth: crust, mantle, core, earth's magnetic field; Recycling of the lithosphere - the rock cycle, weathering (physical, chemical and biological) and erosion, sedimentation, metamorphism; Rock types - igneous, metamorphic and sedimentary rocks; Concept of plate tectonics and continental drift; Geological time-scales.

Module V: Global water balance: hydrological cycle, relationship of surface, groundwater and stream-flow, Stream hydrograph; Groundwater - aquifers; Groundwater exploitation and management.

Module I: Energy basics: Laws of thermodynamics; Forms and types of energy; Energy resources classification - perpetual, renewable and non - renewable; conventional and non-conventional; secondary energy sources; sun as source of energy, nature of its radiation, thermal dynamics of earth system, solar constant, distribution of solar radiation across various atmospheric levels, ecologically important radiations, energy flow in Ecosystems.



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Module II: Non-renewable energy resources: Coal, oil, natural gas, heavy radioactive elements; formation of fossil fuels in the geological time scale, India’s non- renewable energy reserves and usage pattern; world’s energy reserves and consumption; Non-renewable energy usage and limitations, role of fossil fuels in modern economy, Environmental impacts of fossil fuels exploitation and utilization.

Module III: Renewable energy resources: Biomass, wind, hydroelectric, ocean, geothermal; Secondary energy resources - electricity, hydrogen; Alternate energy resources; Renewable energy usage, limitations and scope; modern techniques for energy resource recovery using microbes, solar collectors, photovoltaics, solar ponds, nuclear-fission and fusion, Magneto-Hydrodynamic Power (MHD) and biomass gasification.

Module IV: Nuclear energy generation and environmental safety: radioactivity from nuclear reactors, fuel processing and radioactive waste, hazards related to power plants, dose from environment and nuclear radiations, pathways analysis and dose assessment, radioactivity risk assessment, criterion for safe exposure.

Module V: Energy production and impacts on environment: degradation of air, water and land; Important multipurpose power projects and environmental issues in India; Energy use pattern in different parts of the world and its impact on the environment; energy utilization in urban and rural contexts; Sustainable energy management, problems and solutions; Energy crisis and challenges of energy transformation; Energy conservation measures for sustainable development.

Suggested Readings:

1. Walters, C. (1986), Adaptive Management of Renewable Resources, Macmillan Publishing Company, New York.
2. John, C., Sawhill, H. and Richard, C. (1986), Energy Conservation: Successes and Failures, Brookings Institution Press.
3. Widell, J. W., Weir, A. D. (1986), Renewable Energy Resources, E & F N Spon Limited, London.
4. Goldemberg, J., Johansson, T. B., Reddy, A. K. N. and Williams, R. H. (1988), Energy for Sustainable World, Wiley Eastern Ltd, New Delhi.
5. Joan, S. (1992), Getting to Know about Energy: In School and Society, Falmer Press.
6. IDRC (1993), AGENDA 21: Green Paths to the Future, International Development Research Centre, Ottawa.
7. Gilbert, M. M. (1997), Introduction to Environmental Engineering and Science (2nd Edition), Prentice Hall.
8. Mittal, K. M. (1997). Non- conventional Energy systems: Principles, progress and prospects.



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- Falmer, P., Elliot, D. (2003), Energy, Society and Environment, Technology for a Sustainable Future, Rutledge.
- Robert A. R. and Jack P. K. (2005), Energy and the Environment, Wiley

Environmental pollution and Waste management

ES1C04 Environmental pollution and Waste management

Module 1: Fundamental Concepts (A basic understanding only expected), Chemical equations and Stoichiometry, Chemical Kinetics - Control of reaction - First, second and zero order reactions, Thermodynamics - Energy, enthalpy, entropy - Gibbs energy and chemical potential, Chemical equilibria, Acid-base equilibria, Redox reactions and redox potential, Radio nucleides, unsaturated and saturated hydrocarbons.

Module II: Environmental pollution: Pollution - physical, chemical and biological; radio nuclides, Electromagnetic radiations, Electro-smog, noise and light pollution; sources - industrial, commercial, domestic etc.; Industrial process and their pollution potentials - mining, smelting, cement production, petroleum refining, thermal power plants, pulp and paper, tannery, dairy, textile dyeing and bleaching.

Module III: Chemistry of Air - History of evolution of the earth's atmosphere, Role of chemical constituents in atmospheric processes (Water, CO_x, NO_x, SO_x, O₂ & Ozone). Air pollution: Particulate matter - Respirable and irrespirable, inorganic and organic species in PM; gaseous pollutants (CO, SO_x & NO_x), secondary air pollutants, organic air pollutants, volatile organic pollutants; Green-house gases, greenhouse effect and climate change, Ozone layer - Chemistry of the ozone layer - ozone depletion and the chemicals that cause ozone depletion, Photochemical smog - origin and occurrence, Oxidizing and reducing smog - ecological effects, Acid rain and its ecological effects, trans-boundary air pollution; Meteorological factors affecting air pollutants, diffusion, turbulence and transportation, plume rise and stability conditions, Wind roses; Effects of pollutants on human beings, plants, animals, materials and climate; Ambient air quality standards. Pollution monitoring methods and pollution abatement: Air quality monitoring techniques - high volume air samplers, stack samplers, measurement of PM, gaseous pollutants.

Module IV: Chemistry of Water - Composition and structure of pure water, Physical properties of water and aqueous solutions, Solubility of solids, liquids and gases in water, Chemical reactions and equilibria



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in water – carbonate equilibria, metal ion equilibria, redox equilibria, Water pollution: Physical and chemical properties of water; pollution of water resources, types and sources, solids and turbidity, alkalinity, acidity, salinity, hardness, nutrients, fluoride, heavy metals, organic pollutants, oxygen demanding wastes, (COD, BOD, DO), persistent organic pollutants (DDT, PCBs, PAHs, Dioxin) etc. Pollution monitoring methods and pollution abatement: Water, soil and biological sample analysis for parameters such as dissolved and suspended solids, BOD, COD, turbidity, hardness, chloride, phosphate, sulphate, nitrogen compounds, heavy metals, pesticides, oil and grease etc. Wastewater and its treatment: water as a scarce natural resource, sources of water pollution; Introduction to wastewater treatment and waste management.

Module V: Chemistry of soil - Introduction, weathering and pedogenesis, factors of soil formation, development of soil profile, structure of soil, gross composition - texture and structure, organic and inorganic components of soil, physico-chemical characteristics of soil, ion-exchange and adsorption processes in the soil, classification of types of soil (Reference to India and Kerala), soil quality parameters and assessment, method of analysis of texture (International pipette method). Soil pollution: macro and micro pollutants in soil, heavy metals, radio nuclides, agrochemical pollutants (fertilizers, pesticides, animal wastes), industrial wastes (oil drilling, coal fired power plants, mining), municipal solid wastes, biomedical wastes.

Module VI: Solid wastes: definition, types, source, categories, generation rates; Indian and International scenario; Waste management approaches (collection, segregation and transport of solid wastes); handling wastes at source, domestic, municipal solid wastes; Hazardous wastes; Biomedical wastes; Nuclear wastes; Environmental impacts of wastes; recycling of wastes and waste minimization techniques; solid waste processing technologies, mechanical and thermal volume reduction; biological and chemical techniques for energy and other resource recovery; Introduction to the concepts of waste biomass resources, utilization of organic manure; waste and earthworms, vermicomposting - the concept, advantages and phases; case studies / success stories in India for management of different types of solid wastes

Suggested readings:

1. Timmy, K. and Masatada, S. (1989), Environmental Pollution, Anmol Publications, India.
2. APHA / AWWA (1992), Standard methods for the Examination of water and waste water, 18th edition, American Public Health Association, American Water Works Association, Water Environment Federation, Washington.
3. Abbasi, S. A. (1998), Environmental Pollution and its control, Coent International, Pondicherry.
4. Shaw, I. C. and Chadwick, J. (1997), Principles of Environmental Toxicology, Taylor & Francis Ltd.



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5. Gilbert M. M. (1997), Introduction to Environmental Engineering and Science (2nd Edition), Prentice Hall
6. Connell, D. W. (1997), Basic Concepts of Environmental Chemistry, Lewis Publishers, New York.
7. Freeman, H. M. (1998), Standard Book of Hazardous Waste Treatment and Disposal, Mc Graw Hill, New York
8. David, H. F. and Bela, G. L. (2000), Air Pollution, Lewis Publishers.
9. Robert, U., Ayres, Leslie, A. (2002), A Handbook of Industrial Ecology, Edward Elgar Publishing Limited.
10. Mirsal, I. A. (2004), Soil Pollution, Springer Publications.
11. Marquita, K. H. (2004), Understanding environmental Pollution (Second edition), Cambridge University Press, New Delhi.
12. Manahan, S. E. (2004), Environmental Chemistry, Lewis Publishers.
13. Lawrence, K. W., Yung-Tse, H., Howard, H. L., Constantine, Y., Kathleen, H. L. (2005), Handbook of Industrial and hazardous wastes treatment (Second Edition), Marcal Dekker Inc.
14. Crittenden, J. C. et al (2005), Water Treatment - Principles and Design (Second Edition), John Wiley & Sons.
15. Bailey, R. A. et al (2005), Chemistry of the environment, Academic Press.
16. Shilpa, S., Verma, H. N., Bhargava, S. K. (2006), Air Pollution and its impact on plant growth, New India Publishing Agency.
17. De, A. K. (3rd Ed) (2008), Environmental Chemistry, New Age Publications, India Ltd.
18. Ira, S. R. (2008), Principles and Practices of Toxicology in Public Health, Jones and Barlett Publications.
19. Santra, C. S. (2011), Environmental Science, New Central Book Agency.

Fundamentals of Environmental Engineering

ES 2C 07 Fundamentals of Environmental Engineering

Module I: Introduction to Environmental Engineering: Concepts, characteristics of environmental engineering, civil engineering and environmental engineering, ecological principles and environmental engineering, public and environmental health; ethics in environmental engineering; concepts of industrial ecology and its applicability in environmental engineering.

Module II: Environmental engineering and water pollution: Sources of water pollution, pollutant dynamics in environment, aquatic ecology, self-purification; measurement of water pollution, water



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quality parameters, water pollution treatment (primary, secondary and tertiary, constructed wetlands), reduction, reuse and recycling techniques. Anaerobic, aerobic process, methanogenesis, bioreactors, cell and protein (enzyme) immobilization techniques; Treatment schemes for waste water, dairy, distillery, tannery, sugar, antibiotic industries;

Module III: Environmental engineering and Solid waste: Solid waste characterization, dynamics of wastes in environment, management of solid waste (end of the pipeline techniques, management at the origin) and disposal of wastes; reduction, reuse and recycling techniques. Treatment methods (composting, incineration, pyrolysis, sanitary landfills); Waste disposal in landfills (site selection, design, and operation of sanitary landfills, secure landfills and landfill bioreactors); leachate and landfill gas management; landfill closure and post-closure environmental monitoring; landfill remediation). Legislation on management and handling of municipal solid wastes, bio-medical wastes and hazardous wastes, Vermicomposting and vermi-technology.

Module IV: Environmental engineering and Air pollution: Air pollution characterization, pollutant dynamics in environment, management of air pollution (end of the pipeline techniques, management at the origin) and disposal of wastes; reduction, reuse and recycling techniques.

Module V: Environmental engineering and physical pollution: Physical pollution (noise, radiation, light), pollutant dynamics in environment, management of physical pollution (end of the pipeline techniques, management at the origin) and control techniques.

Suggested Readings:

- Gilbert, M. M. (1997), Introduction to Environmental Engineering and Science (2nd Edition), Prentice Hall.
- Brimicombe, A. (2003), GIS, Environmental modeling and engineering, Taylor & Francis, London.
- Ruth, F. W. and Matthews, R. (2007), Environmental Engineering (4th Edition).
- Butterworth, H., Glenn, O. S., Delmar D. F., William, J. E. and Richard K. F. (1992), Soil and Water Conservation Engineering, John Wiley & Sons.
- Vesilind, P. A. (1997), Introduction to Environmental Engineering, PWS Publishing Company, Boston.
- Stanley, E. M. (1999), Industrial Ecology: Environmental Chemistry and Hazardous Waste (1st edition), CRC Press.
- Robert, U. A., Leslie, A. (2002). A Handbook of Industrial Ecology, Edward Elgar Publishing Limited.
- George, T., Franklin, L., Burton and Stensel, H. D. (2003), Waste water engineering - treatment and re-use (4th Edition), Metcalf & Eddy Inc., Tata McGraw Hill, New Delhi.



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Environmental Microbiology and Biotechnology

ES 2C 08 Environmental Microbiology and Biotechnology

Module I: Scope and history of Environmental Microbiology: - characteristics, classification, identification and morphology of microorganisms. Microbial world: Bacteria, Archaea, Fungi, Algae, Virus, Protozoa. Identification of microorganisms – Direct microscopic examination, culture characteristics, biochemical and physiological properties, Antibiotic sensitivity testing, serological methods, Phage typing, protein analysis, comparison of nucleotide sequences.

Module II: Environmental Microbiology: Physiological status of microorganisms in the environment. Organic substrate use by microorganisms, Microbes in air, water and soil. Microorganisms in extreme environments, Foreign derived microorganisms- Survival and fate, genetically engineered microorganisms - fate and effects.

The aquatic microorganisms. Nature of marine and fresh water environments, Biofilms and Microbial mats, Water and disease transmission, Microbial analysis of water quality.

The environment of soil microorganisms, Microbial diversity in soil, biogeochemical role of soil microorganisms. Biodegradation of herbicides and pesticides. Soil microorganisms associated with plants. Soil microorganism’s interactions with the atmosphere, the role and importance of microbial ecosystems, biogeochemical transformation

Module III: Environment Biotechnology–Principles and scope, Role of biotechnology in Environmental Protection, biotechnology in industrial pollution control – Paper industries, Textile Industries, Petrochemical Industries, Leather Industries and Mining Industries.

Module IV: Emerging trends in Environment Biotechnology – Agro – biotechnology – Bio -pesticides and Bio - fertilizers; Ecological Engineering - Aquatic macrophyte based wastewater treatment systems (AMATS) - constructed/artificial wetlands, Nutrient film techniques (NFT), Municipal solid waste management, Role of composting and vermicomposting; Biodegradable plastics – Biopolymers - PHBs and PHAs, Phyto– reactors - Plants used to produce genetically engineered products

Module V: Biotechnological Methods in Pollution Control –Air pollution control: Bio scrubbers, biofilters and membrane bioreactors. Bio - desulphurization of coal. Green belts. Bioremediation: Soil/ land contaminated with oil spills, and synthetic organic compounds (xenobiotics) such as PCBs, PAHs. Bioremediation technology, bioremediation of marine oil spills. Phytoremediation. Biosensors. - Concept,



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principle, and development of biosensors. Biosensor's for environmental monitoring- BOD, ammonia, and nitrite.

Suggested Readings:

1. Freeman, W. H. and Lynch, M. and Hobbie, J. E. (1988), Microorganisms in Action-Concepts and applications of Microbial Ecology, Blackwell Scientific Publications.
2. Claus, W. G. (1989), Understanding Microbes A Laboratory Text Book for Microbiology, W. H. Freeman.
3. Prescott, L. M., Harley, J. P. and Klien, D. A. (1993), Microbiology, WCB Publishers.
4. Pelczar, M. J., Reid, R. and Chan, E.C.S. (1996), Microbiology, Tata Mc-Graw Hill Publishing Co Ltd, New Delhi.
5. Abbasi, S. A. (1998), Environmental Pollution and its control, Coent International, Pondicherry.
6. Abbasi, S. A. and Ramaswamy, E. V. (1999), Biotechnological Methods of Pollution Control, Universities Press India Ltd, Hyderabad.
7. Ogilvie, L. A., Hirsch, P. R. (2012), Microbial Ecological Theory: Current Perspectives, Caister Academic Press.



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Hydrology and Water Resource Management

ES 2C 09 Hydrology and Water Resource Management

Module I: Introduction to hydrology: Definition, History of hydrology, Branches of hydrology - Chemical hydrology, Eco-hydrology, Hydrogeology, hydro-informatics, hydrometeorology, isotope hydrology, surface hydrology.

Module II: The hydrologic cycle: Structure and properties of water, Inventory of Earth's water; different process of hydrologic cycle - precipitation, Canopy interception, snow melt, run off, sub surface flow, infiltration, evaporation, transpiration, sublimation, advection, condensation.

Module III: Surface water resources: precipitation, infiltration, water balance, Evapo-transpiration and runoff; Drainage basin, Surface water hydrology - rainfall and surface runoff relationship, runoff, runoff characteristics, open channel flow; Statistical analysis in hydrology, Probable maximum precipitation, hydrograph, flow duration curve, Flood frequency analysis and estimation, Water balance.

Module IV: Groundwater resources: Rock properties affecting ground water, vertical distribution of ground water, zone of saturation; Darcy's law - permeability, transmissivity and storage coefficient; Viscous character of groundwater flow; Geologic formations as aquifers, type of aquifers; Distribution of water - local, regional and global; Ground water exploration.

Module V: Water resource management: Flood and flood plain management; Water-shed management, water harvesting and artificial recharge to ground water; water pollution and water treatment; Wetland and riparian management; forest management and water resources; Issues concerned with river linking in India.

Suggested readings:

1. Aggarwal, A. (1991), Floods, Floodplains and Environmental Myths, Centre for Science and Environment, New Delhi.
2. Andrew, D. W. and Stanley, T. (2004), Environmental Hydrology (2nd Edition), Lewis Publishers.
3. Karanth, K. R. C. (1988), Ground Water: Exploration, Assessment and Development, Tata-McGraw Hill, New Delhi.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

4. Mahajan, G. (1989), Evaluation and Development of Groundwater, Ashish Publishing House, New Delhi.
5. Rao, K. L. (1982), India's water wealth, Orient Longman, Delhi.
6. Subramaniam, V. (2002), Text Book of Environmental Science, Narosa Publishing House, Delhi.
7. Timothy, D. (2003), Fundamentals of Hydrology, Rutledge, Taylor and Francis Group, U.K.
8. Todd, D. K. (2004), Groundwater Hydrology, John Wiley & Sons Inc.
9. Vijay, P. S. (1995), Environmental Hydrology, Kluwer Academic Publications, The Netherlands.
10. Wright, R. T. and Nebel, B. J. (2002), Environmental Science: toward a sustainable future, Prentice Hall India Ltd, 8th Edition.

Remote Sensing and GIS

ES 2C 10 Remote Sensing and GIS

Module I: Fundamentals of Environmental Appraisal Tools- Scales-Definition, types of scales, representation and conversion (introduction only), Maps-Definition and classification, Map conversions (Grids, Contours, Isobars, etc.), Measurements of area and distance (Square and Planimeter Methods), Topographical Maps, Cadastral maps, Toposheets (Interpretation and studies), Surveying - Definition and classification, Survey instruments (Introduction to Compass, Theodolite, Clinometer, Abney Level, Cartographic equipments), Preparation of maps (Basics of cartography), Photogrammetry - Definition and types (Aerial and terrestrial photographs), Method and equipments used in Aerial Photo Interpretation (Introduction only).

Module II: Remote Sensing: Introduction- Definition, History and Scope of Remote Sensing, Meaning and Scope of remote Sensing, Indian Remote sensing Programmes.

Module III: Remote Sensing: Electromagnetic Spectrum, Sensors and Platforms, Types of platforms, scanners and data products, Image processing, Photo-interpretation and Photogrammetry, Applications of remote Sensing

Module IV: Geographical Information System (GIS) I: History and Development, Concepts, Components and organization of GIS, Introduction to mapping and GIS, Remote Sensing, GPS and GIS.

Module V: Geographical Information System (GIS)II: Fundamentals of computing GIS, Theory of GIS, Spatial Data concepts, Processing and visualization, Information analysis and digital data processing, Introduction to GIS packages, Geographical analysis, Applications of GIS.

Suggested Readings:



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Begni, G. and Richard, E. (2005), Remote sensing: a tool to monitor and assess desertification, Les dossiers thématiques du CSFD.
2. Daplyn, P., Cropley, J., Treagust and Gordon, A. (1994). The use of Geographical Information Systems in Socio-economic Studies, The Natural Resources Institute.
3. Donnay, J. P., Barnsley, M. J. and Longley, P. A. (2001), Remote Sensing and Urban Analysis, Taylor & Francis, London.
4. Franklin, S. E. (2001), Remote Sensing for Sustainable Forest Management, Lewis Pub, London.
5. Haynes, R. (1982), Environmental Science Methods, Chapman and Hall London.
6. Heywood, I., Cornelius, S. and Carver, S. (1998). An introduction to Geographical Information systems. Pearson education Ltd New Delhi.
7. Janwar, M. L. and Chouhan, T. S. (1998). Remote sensing and Photogrammetry, Vijayan Prakashan, Jodhpur.
8. Jha, V. C. (2000), Geomorphology and Remote Sensing, ACB Publications, Calcutta.
9. Khan M. Z. A. (1998), Test Book on Practical Geography. Concept Pub. Co., New Delhi.
10. Khna, N. (1998), Quantitative methods in Geographical Research, Concept Pub Co. New Delhi.



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Environmental assessment tools and monitoring methods.

ES 3C 13 Environmental assessment tools and monitoring methods.

Module I: Quantitative and qualitative depletion of environmental resources, Methods of resource analysis. Monitoring of Environmental resources.

Module II: Basics of Environment Impact Assessment (EIA) and Risk Assessment (RA): Concept of EIA, Evolution of EIA, EIA practice in India, EIA Notifications 1994, 1997 2009; Other related notifications; Project Screening in EIA, defining and examining scope, objectives and alternatives in EIA Projects, project planning and processes, baseline information, Impact prediction, decision making; cumulative impact assessments, strategic impact assessments.

Module III: Types of EIA: Rapid EIA, comprehensive EIA, strategic EIA, data collection, ecological impacts, environmental impacts (Air, water, land and noise), socioeconomic and cultural impacts, health impacts, prediction of impacts; methodologies, cost benefit analysis, Environmental Management Plan (EMP).

Module IV: Environmental Impact Statements: Preparation and contents of Environmental Impact Statements (EIS); Reviewing EIA / EIS; Use of EIA in public participation and decision making; EIA in sustainable development. EIA - case studies: mining projects, hydroelectric projects, nuclear power projects, thermal power projects, refineries etc.

Module V: Fundamental Statistics

Introduction - Importance and limitation; Classification and tabulation of data; Graphical representation; Measures of central tendencies - mean median and mode; Measures of dispersion - range, standard deviation and co-efficient of variation; Moments, Skewness and Kurtosis; Limit theorems: Central limit theorem, Strong Law of large number, Weak Law of large number. Correlation and regression - Scatter diagrams - Karl Pearsons coefficient of correlation - Rank correlation - Linear and Curvilinear regressions; Probability - Basic probability and statistics, probability fundamentals, computation and laws of probability, fundamentals of inference; probability theory, sample space and events, axioms of probability, conditional probability, independent events, Bayes' formula; addition and multiplication theorems - Binomial, Poisson

and normal distribution, Probit analysis (Graphic Method only); Testing of Hypothesis: Null and alternative hypothesis - Two types of error -Level of significance test based on t, z, Chi-square and



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analysis of Variance – one - way, two - way, three - way analysis (Computational only using softwares for data analysis like Excel, SPSS, Minitab and R Module)

Module VI: Application of computers in statistics

Data analysis using packages - SPSS, Introduction to Database Management System (DBMS), Data structures in eco-informatics, Databases for eco-informatics, Web applications development in eco-informatics: Introduction to Internet, protocols, WWW, URL, Web Site, Web Browser, Web Server. Eco-informatics applications in Natural Resources Management, wildlife conservation and management, habitat suitability studies, habitat modeling in study of anthropogenic pressures on environment such as industrialization, urbanization and other threats.

Suggested Readings:

1. Ludwig, J. A. and James F. R. (1988), Statistical Ecology, John Wiley & Sons
2. Gupta, S.P. (2004), Statistical Methods, Sultan Chand & Sons New Delhi
3. Robert, R. S. and James, F. R. (1994), Biometry: the principles and practices of statistics in biological research (3rd edition), W. H .Freeman.
4. Zar, J. H. (1999), Biostatistical analysis, Person Education, New Delhi.
5. Bowerman, B. L., Richard, T. O. and Michael, L. H. (2001), Business statistics in Practice, McGraw-Hill Irwin.
6. Harry, F and Steven, C. A. (1994), Statistics - Concepts and applications, Cambridge
7. Frederick, E. C., Dudley, J. C. and Sidney, K. (1979), Applied General Statistics, Prentice Hall India.
8. Richard, I. L. and David, S. R. (1997), Statistics for Management (7th Edition), Prentice Hall.
9. Digby,P.G.N.and Kempton, R. A. (1991), Multivariate analysis of ecological communities, Chapman and Hall, London
10. Friedrich, R. (2005), Ecological Informatics - Scope, Techniques and Applications, Springer.



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Environmental Toxicology and Occupational Health and Safety

ES 3C 14 Environmental Toxicology and Occupational Health and Safety

Module I: Ecotoxicology as a synthetic science: major classes of environmental pollutants - inorganic, heavy metals, organics, organometallics, radioactive isotopes, gases; routes of entry into ecosystems - surface waters, land, atmosphere; long-range movement and global transport of pollutants; Fate of pollutants in ecosystems - biotransformation, bioaccumulation and biomagnification.

Module II: Toxicity testing: Test organisms used in bioassays; Definition of toxicity, case studies (As, Hg problems); Concept of dosimetry - lethal, sub-lethal and chronic tests, dose response curves, LC50, MATC-NOEC, brief statistical methodology; toxicant effects - cellular, organismic, population and ecosystem - Level effects, global effects.

Module III: Biochemical effects of environmental contaminants: environmental carcinogens, mutagens, asbestos, hormone mimics; Biomarkers and bio-indicators; metabolic impacts; biochemical parameters - enzymes, metabolites, structural changes, biosynthesis and catabolism of proteins, lipids, carbohydrates and nucleic acids, toxic response of different tissues and organelles, tissue specificity.

Module IV: Environmental health and safety: Concept of environment, health and safety; Diseases through pollution (Environmental contamination related diseases- Gastroenteritis, Hepatitis, allergies, respiratory diseases, food - borne diseases, vector borne diseases); Management to control diseases; Occupational health, health and safety considerations; Environmental health and human society, Health problems in different types of industries: Construction, textile, steel, food processing, tanneries, cement, thermal and nuclear power plants, pharmaceuticals; Occupational health and safety considerations in waste treatment plants.

Module V: Environmental health and occupational hygiene: Basis of environment and occupational health, biological monitoring (e.g. BEI), Occupational hygiene, preventive measures; Occupational health & safety management system, OHSAS – 18000.

Module VI: Safety and health management: Occupational health hazards, Promoting safety, Safety and health training, Stress and safety; Ergonomics, Introduction, Definition, Objectives, Advantages; Ergonomics hazards, Musculoskeletal disorders and cumulative trauma disorders; Importance of industrial safety, role of safety department, Safety committee and function.

Module VII: Environmental risk assessment and management: Perceived risks, real risks, hazard identification, hazard characterization, health risk assessment, risk management.



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Suggested Readings:

1. Rowland, A. J. and Cooper, C. (1983), Environment and Health, Edward Arnold Publishers Ltd, Basic Concepts of Environmental Health, NIH Publication.
2. Encyclopedia of Occupational Health & Safety (Vol. 1 & 2, 3rd Revised Edition), International Labour Organization.
3. Jain, R. K. and Rao, S. S. (2006), Industrial Safety, Health and Environment Management Systems, Khanna publishers, New Delhi.
4. Slote, L., Handbook of Occupational Safety and Health, John Willey and Sons, New York.
5. Hayes, A. W. (1988), Principles and methods of toxicology (2nd edition), Raven press, New York.
6. Stewart, C. P. and Stolman, A. (1960), Toxicology (Vol. I), Academic press, New York.
7. David A. W. and Pamela, W. (2002), Environmental Toxicology (1st edition), Cambridge Environmental Chemistry Series, Cambridge University Press.
8. Newman, M. C., Lawrence C. A., and Unger M. A. (2002), Ecotoxicology: Fundamentals of Ecotoxicology (2nd Edition), CRC Press, Boca Raton, Florida.
9. Walker, C. H., Hopkin, S. P., Sibly, R. M. and Peakall, D. B. (2001), Principles of Ecotoxicology (2nd Edition), Taylor & Francis, London.
10. Moore, G. S. (2002), Living with the Earth: concepts in Environmental Health Science (2nd Edition), Lewis publishers, Michigan.



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Biodiversity and Conservation

ES 3C 15 Biodiversity and Conservation

Module I: Natural resources: Ecological concepts related to natural resources, matter, energy; renewable and non-renewable resources; soil, water, plants, animals etc. Wetlands, water bodies, Forests; ecosystems services etc. Biodiversity concepts and patterns: organic evolution through geological time scale; Microbial diversity, Plant diversity, Soil biodiversity; Levels of biodiversity: Community diversity (alpha, beta and gamma biodiversity), Gradients of biodiversity (latitudinal, insular).

Module II: Biodiversity - scales: Ecosystems diversity - biomes, mangroves, coral reefs, wetlands and terrestrial diversity; Species diversity - richness and evenness; Genetic diversity: sub species, breeds, race, varieties and forms; benefits from biodiversity - direct and indirect benefits, Ecosystems services, Bio-prospecting; Biodiversity hotspots and their characteristics

Module III: Threats to Biodiversity: Habitat loss and fragmentation; disturbance and pollution; introduction of exotic species; extinction of species; human intervention and biodiversity loss: global environmental changes, land and water use changes; national and international programmes for biodiversity conservation; Biodiversity convention and biodiversity Act, IPRs.

Module IV: Biodiversity conservation: Conservation movements - International and National; ecologically relevant parameters (viable population, minimum dynamic area, effective population size, metapopulations); reproductive parameters in conservation (breeding habitats, mating systems, inbreeding depression, genetic bottlenecks, genetic constraints); IUCN categories - endangered, threatened, vulnerable species; Red Data Book and related documentation; threatened plants and animals of India, ecosystems, people and traditional conservation mechanisms.

Module V: Ex-situ / in-situ conservation: Botanical gardens, Zoos, Aquaria, Homestead garden; Herbarium; In-vitro conservation – Germplasm and Gene bank; Tissue culture - Pollen and spore bank, DNA bank; Wildlife values and eco-tourism, wildlife distribution in India, problems in wildlife protection, organizations involved in conservation (WWF, WCU, CITES, TRAFFIC etc.), Wildlife Protection Act 1972; In-situ conservation: sanctuaries, biospheres reserves, national parks, sanctuaries and nature reserves, preservation plots.

Suggested Readings:



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Daly, G.C. (1997), Nature's Services: Societal Dependence on Natural Ecosystems, Island Press, Washington D.C.
- Dobson, A.P. (1996), Conservation and Biodiversity, Scientific American Library, New York.
- Gaston, K.J. Spicer, J. I. (1998), Biodiversity - An Introduction, Blackwell Science, London.
- Groom, B. B. and Jenkins, M. (2000), Global Biodiversity: Earth's Living Resources in the 21st Century, World Conservation Press, Cambridge, UK.
- IUCN (2004), Red list of threatened species - a global species assessment, IUCN, Gland, Switzerland
- Loreau, M. and Inchausti, P. (2002), Biodiversity and Ecosystem functioning: Synthesis and Perspectives, Oxford University Press, Oxford.
- Primack, R. B. (2002), Essentials of Conservation Biology (3rd Edition), Sinauer Associates, Sunderland, SA.
- Pawar, S. N., Patil, R. B., and Salunkhe, S.A., (2005), Environmental Movements in India: Strategies and Practices, Rawat publications, Jaipur.
- Wilson Edward O. (1993), Diversity of Life, Harvard University Press, Cambridge, MA.
- Klee, G. A. (1991), Conservation of natural resources, Prentice Hall.

Environmental Disaster Management

ES 3C 16 Environmental Disaster Management

Module I: Disaster management system - Flood damage assessment, Environmental Impact Analysis, Trans-boundary air pollution, Site suitability assessment, Pollution monitoring and management, Vehicular pollution assessment, Prediction and forecasting.

Module II: Weather and climate: climate science, thermal inversion, heat island, natural hazards: volcanoes, earth quake, tsunami, land slide, tornadoes, storms, hurricane and flood. Coastal erosion, Air pollution: sources and impacts, green-house gases; global warming, acid rain, ENSO, EL NINO, LA NINA, Climate change: Treaties and conventions - IPCC.

Module III: Forest protection and management: objectives and principles; Introduction to silviculture and silvicultural systems; forest protection from fire, injuries by exotic and noxious plants, animals and shifting cultivation; forest cover monitoring.

Module IV: Hydrologic hazards: earthquake, acid rain, eutrophication, flood, landslides, salt-water intrusion, avalanches, drought, desertification. Urbanization stress and health; Water in relation to human health: case studies.



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Module V: Disaster Management: Concept and scope of disaster management / emergency management. Professional activities – Mitigation, preparedness, response, recovery, programme planning and management. Tools of disaster management – Forecasting and warning systems of disasters - Measurement of responses of disasters, Community reaction to disasters, Disaster management - Emergency Management Information Systems (EIMS). Phases of disaster management – Pre disaster phase, Actual disaster phase, Post disaster phase. Disaster assistance - Technological assistance, Relief camps, Camp layout, Food requirement, Water needs, Sanitation and Security. Environmental problems faced by India and the world. Sustainable development - problems and perspectives.

Suggested Readings:

1. Nyle, C. B. (1996), Nature and Properties of soil, Collier Macmillan International Editions.
2. John, H. (2004), Global Warming: Complete Briefing, 3rd Ed., Cambridge University Press.
3. Nicholas, S. (2007), The Economics of Climate Change: The Stern Review. Cambridge University Press.
4. Andrew, E. D. and Edward, A.P. (2006), The Science and Politics of Global Climate Change: A Guide to the Debate. Cambridge University Press. New York.
5. Muller, R. N. and Donahue, R. L. (1996), Soils in our environment, Partier hall India.
6. Mackenzie, A. and Sonia, R.V. (2002), Ecology Instant Notes by Viva Books Private Limited, New Delhi.

Indian Environmental Laws

ES 4E 20 Indian Environmental Laws

Module I: Environmental ethics: concepts, ethical theories, consequential theory, deontological theory, virtue ethics, situation ethics, feminist ethics, Illustration cases, DPGs, Bio-piracy, GMO, Stem cell research. Environment and constitution of India, Environmental legislature machinery, Constitutional status of environment, Duty to protect environment.

Module II: Major Indian environment / conservation related acts: Introduction to Water (Prevention and Control of Pollution) Act - 1974, Water (Prevention and Control of Pollution) Cess Act -1974, Wildlife (Protection) Act -1972, Forest (Conservation) Act -1980, Air (Prevention and Control of Pollution) Act - 1981. The Environment (Protection) Act -1986, The Public Liability Insurance Act – 1991.



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Module III: Laws on water and air pollution control: Powers of Central and State Pollution Control Boards, Prevention and control of Water Pollution, Closure or stoppage of water and electricity supply, Power of Central / State Governments to supersede the respective Central / State Boards; Air Pollution Control Areas, pollution control strategies, Prohibition of Emission of Air Pollutants.

Module IV: Environment (Protection) Act - 1986: Powers of Central Government, Legal Regulation of Hazardous Substance, Hazardous Wastes (Management and Handling) Rules - 1989, The Natural Environment Tribunal Act - 1995, Legal Measures to Control Noise Pollution, Solid waste management and handling rules - 2000; Biomedical wastes (Management and Handling) Rules - 1999; Coastal Regulation Zone Notification – 1991.

Module V: International environmental treaties and conventions: Montreal Protocol, Earth Summit, Agenda 21, Biodiversity Act - 2002, Kyoto Protocol, Copenhagen Summit - 2009, Millennium Development Goals, Basel convention.

Suggested Readings:

1. Singh, G. (2005), Environmental Law in India, Macmillan India Ltd, New Delhi.
2. Krishnamoorthy, B. (2005), Environmental Management, Prentice Hall of India Private Limited, New Delhi.
3. Agarwal, S.K. (1997), Environmental Issues and themes, APH Publishing Corporation, New Delhi.
4. John, O. N., Turner, R. K. and Bateman, I. J. (2001), Environmental Ethics and philosophy, An Elgar Reference collection, USA.
5. Trivedi, R. K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards (Vol I and II), Enviro Media.
6. Jadhav, H. and Bhosale, V. M. (1995), Environmental Protection and Laws, Himalaya Publishing House, Delhi

Current Environmental Issues in India

ES 4E 21 Current Environmental Issues in India

Module I: Realms of Environment: Atmosphere, Hydrosphere, Lithosphere and Biosphere, Solar system, overview of natural resources; Environmental problems faced by India; Sustainable development, concepts, problems and perspectives.



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Module II: Weather and climate: climate science, thermal inversion, heat island; natural hazards: volcanoes, earth quake, tsunami, land slide, tornadoes, storms, hurricane and flood; coastal erosion; greenhouse gases: global warming, acid rain, Enso, El-nino, La-nina; Climate change, treaties and conventions, impact of climate change on water resources and agriculture.

Module III: Environment, forest and wildlife: Forests in India, forest cover and types of forests, deforestation, conservation of forest resources; Biodiversity, wild life, endangered and threatened species, Biosphere reserves, national parks and sanctuaries, wet lands, mangroves and coral reefs; Wildlife conservation in India, Illegal trade in wildlife – poaching; Recent measures for wildlife protection and conservation of national heritage - UNESCO's World Heritage list.

Module IV: Social construction of environmental issues: anthropogenic pressures on natural resources, conflicts and negotiation; Benefit-cost approach to environmental problems; Institutional mode of environmental planning, policy formulation and strategies.

Module V: Environmental movements: History, People’s movement for environmental conservation in India- Bishnoi Movement, Chipko Movement, Narmada Bachao Andolan, Apikko movement, Silent Valley Movement, Baliyapal, drivers for environmental movement, popular movements and people’s participation.

Suggested Readings:

1. Ramachandra, G. M., A. J. (2000), Varieties of Environmentalism, Oxford University Press, Delhi.
2. Ramachandra, G. (2000), The Unquiet Woods: Ecological Change and Peasant Resistance in the Himalaya, University of California Press.
3. Agarwal, S. K. (1997), Environmental Issues and themes, APH Publishing Corporation, New Delhi.
4. Edward, S. W., Jean G. S., (2004), Sustainable Strategic Management, M. E. Sharp Inc.
5. Gangstad, E.O. (1990), Natural Resource Management of Water and Land. Van Norstrand Reinhold. New York
6. William, E. G. et al. (2009), Ecology and Natural Resource Management.
7. Mitchell, B. (1997), Resource and Environmental Management, Addison Wesley Longman Ltd, Edinburgh.
8. Andrew, E. D. and Edward, A.P. (2006), The Science and Politics of Global Climate Change: A Guide to the Debate. Cambridge University Press, New York.
9. Muller, R. N. and Donahue, R. L. (1996), Soils in our environment, Partier hall India.
10. Mackenzie, A. and Sonia, R.V. (2002), Ecology Instant Notes by Viva Books Private Limited, New Delhi.



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Environmental Economics

ES 4E 23 Environmental Economics

Module I: Introduction, World environmental history and economic development. Nature and scope, Principles of environmental economics. Interrelationship between economics, environment and ecology. Foundation of environmental economics. Nexus between Ecology and Economics - The Principle of Material Balance - Private versus Social Cost.

Module II: Environmental Economics - Basics and trends, Environment and economy, environmental and economic growth, environmental and development. Basic concept of sustainable development, Measures for sustainable development. Main characteristics of environmental goods - Pure public goods, Mixed collective goods, public bads, externalities, consumption and demand, production and supply, Marginal analysis. Market and market failure, externalities – marginal social cost, marginal private cost, marginal external growth, cost and solution to externality. Principles of maximum social welfare - Pareto Criterion.

Module III : Resource economic: Economics of natural resources. Population growth and its impact on environment. The concept of common property resource and issues in global environmental resource sharing. World trade and the environment – International trade, Intellectual Property rights. Social CBA (Cost Benefit Analysis). Economic CBA, Environmental pollution - control, private cost and social cost. Application of CBA - Technology versus Environment - Coase's Theorem - Simon Kuznets's inverted 'U' shaped curve.

Module IV: Economics of Pollution Control - Environmental Impact Assessment - Evaluation of Project and Programme – Benefit / Cost Analysis - Contingent valuation method - Measurement of environmental damages - Valuing environmental benefits: Hedonic price approach - Ecological footprint approach, Systems approach.

Module V: Renewable resources - Growth curves - the rate of exploitation - open access and common property solutions - exhaustible resources - monopoly and the rate of extraction - ecosystem services – Institutional approaches to environmental problems.

Suggested Readings:

1. Ramprasad, S. (2001), Ecology and economic - an approach to sustainable development, Oxford.
2. Adishesiah, M. S. (1987), Economics of environment, Lancer International, India International Center, New Delhi.
3. Pearce D. W. and Kerry R. T. (1990), Economics of Natural Resources and the Environment, Harvester wheat sheaf, New York.



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- Seneca J. J. and Michael K. T. (1974), Environmental Economics, Prentice Hall, New Jersey.
- Kerr J. M. K., Marothia, D., Katar, S., Ramasamy, C. and Bentley, R. W. (1997), National Resource Economics – Theory and application in India, Oxford & IBH publishing Co, New Delhi.
- Charles, D (2000), Environmental Economics, Oxford University Press, New York
- David, P. and Moran, D. (1994), The Economic value of biodiversity, Earth scans.

Green Chemistry

ES 4E 25 Green Chemistry

Module I: Introduction to Green Chemistry

The basics of sustainability, green chemistry and general chemistry; Chemical production (the old and new), Energy (Fossil fuel, batteries, bio-fuels, solar), Plastics (petroleum and biopolymers); The fate of chemicals in the environment: Pesticides, heavy metals, pharmaceuticals and personal care products; prevention of chemical accidents.

Module II: Green Chemistry and Industrial Processes

Principles of Green Chemistry, Evaluating the effects of Chemistry, Waste: production, problems & prevention; Designing greener processes; Sustainable industrial chemistry; Renewable resources; Emerging Green Technologies & Alternative Energy Sources; Sustainable Industrial Chemistry - Bio-diesel.

Module III: Pollution Prevention, Green Chemistry and Green Engineering

Introduction to concepts - Properties and fates of environmental contaminants - types of compounds and where they end up: Humans - Industrial activity and the environment. Types of pollutants produced by humans with case study; Improving, manufacturing through green alternatives. Economic perspectives on pollution prevention and minimization. Sustainability and recycling. Water - Sources of water pollution, types of contaminants, treatment techniques; Air - Sources of air pollution, acidic aerosols and the ozone hole, climate change and global warming. Energy - Types of energy sources and their environmental impact, treatment of energy, production waste and alternative energy sources. Agriculture - Pollution from fertilizers and pesticides. Impact on nature (wildlife and food supplies). - Green alternatives for fertilization and pest control.

Suggested Readings:

- Ahluwalia, V. K. (2013), Green Chemistry, Alpha Science International.
- Ahluwalia, V. K. and Kidwai, M. (2007), New trends in Green Chemistry, Anamaya Publishers.



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- Misra, S. P. and Pandey, S. N. (2009), Essential Environmental Studies, Ane Books Pvt.Ltd
- Bhatia, S.C. (2006), Environmental Chemistry, CBS publications.
- Anil Kumar De (2007), Environmental Chemistry, New age Publications.
- Bharucha, E. (2001), Text Book of Environmental Chemistry, Oxford & IBH.
- Ahluwalia, V. K. and Sunita, M. (2008), Environmental Science, Ane Books Pvt. Ltd

Physiology and Endocrinology

ZOL6B10T Physiology and Endocrinology

SECTION A: PHYSIOLOGY

Module I

Nutrition (5 hrs.)

Regulation of digestive activity: Nervous and hormonal control; Ruminant digestion; Nutrition in pregnancy, infant nutrition, breast feeding, composition of breast milk; Importance of dietary fibres; Balanced diet; Nutritional disorders: anorexia, acidity, ulcer, flatulence; starvation, fasting and its significance; Obesity: causes and consequences.

Module II

Respiration (6 hrs.)

Gaseous exchange and transport of respiratory gases (brief account), Oxygen- Haemoglobin dissociation curve; Respiratory pigments, structure and properties of Hb; Neurophysiological control of respiration; Physiological problems in diving mammals, new-born and aged individuals.

Module III

Circulation (6 hrs.)

Blood: functions and composition; Coagulation of blood (Enzyme cascade theory); Clinical analysis of blood, ESR; Haemodynamics; Haemostasis, haemolysis and jaundice, haemoglobinopathies; Blood transfusion and agglutination, aphaeresis. Types of heart; ECG; Common cardio-vascular problems: Abnormal variations in BP, Tachycardia, Bradycardia, Myocardial infarction, heart failure, cerebral hemorrhage and cerebro-vascular accident.



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Module IV

Osmoregulation and Excretion (6 hrs.)

Osmoconformers and osmoregulators; Water conservation in desert forms; Osmotic and ionic regulation in terrestrial, fresh water and marine animals; Types of excretion, urea cycle; Human kidney: Urine formation with counter-current mechanism and hormonal regulation; Common renal disorders: haematuria, uremia, proteinuria, renal hypertension, nephritis, renal calculi, oedema, acidosis and alkalosis; Dialysis.

Module V

Muscle Physiology (5 hrs.)

Structure of vertebrate skeletal muscle: EM structure of Myofibrils and Myofilaments, contractile proteins; Mechanism of muscle contraction: Ultra structural changes (sliding filament theory); physiology, biochemistry and energetics of muscle contraction; energy sources, role of creatine phosphate, cori cycle; Muscle twitch, fatigue, tetany and rigor mortis.

Module VI

Nerve Physiology (6 hrs.)

Different types of nerve cells; glial cells, giant nerve fibre of crustaceans and cephalopods; regeneration of medullary fibres, neurotrophins; Nerve impulse transmission, synapses and neuromuscular junctions, synaptic transmission (electrical and chemical), neurotransmitters.

Module VII

Bioluminescence and Bioelectricity (2 hrs.)

Classification of bioluminescence: symbiotic, extracellular and intracellular; Physiology and significance of light production; Structure and functions of electric organs.

SECTION B: ENDOCRINOLOGY (18 hrs)

Module VIII

Invertebrate and Vertebrate endocrinology (12 hrs.)

Neuro- endocrine organs and hormones in crustaceans and insects.

Classification of hormones: Amine, peptide and steroid hormones; Endocrine glands in man (hypothalamus, pituitary, thyroid, parathyroid, pancreas, adrenal, thymus, pineal and gastro-intestinal): their hormones and functions (brief account); Hormonal disorders. Hormones of reproduction: Testes, ovaries and placenta, their hormones and physiological effects; role of hormones in female sexual cycle; hormone related female and male sexual dysfunctions.



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Module XI

Concept of neurosecretion and hormonal action

Hypothalamus-hypophysial interactions, hypothalamus releasing and inhibiting hormones and their roles, Neuro-hormonal integration, Neuro-endocrine pathways, Regulation of hormone secretion. Hormonal action: Hormone receptors; Mechanism of action of peptide and steroid hormones; mode of action of insulin and thyroxine; positive and negative feedback regulation.

Topics for assignments/seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. History, aim, scope and branches of Physiology.
2. Absorption of carbohydrates, proteins, and lipids.
3. Conducting system of the heart.
4. Composition and functions of lymph.
5. Gross and micro structure of human kidney.
6. Endocrine disorders in man: Cushing's disease, Addison's disease, diabetes mellitus, diabetes insipidus, dwarfism, gigantism, cretinism, myxedema and goiter.

References

- Arthur Vander, James Sherman and Dorothy Luciano (1998) Human Physiology: The Mechanisms of Body Function, ISBN-10: 9780070670655, William C. Brown Pub., 818 pages
- Berry, A.K (2008): *A Text book of Animal Physiology*, 12th Edition, ISBN 10 8185712034, Emkay Publications, 686 pages
- Chatterjee, C.C (2016): *Human Physiology*, 11th Edition ISBN-10 8123928726 Medical Allied Agency.
- Gerard J. Tortora, Bryan H. and Derrickson (2016) *Principles of Anatomy and Physiology*, 15th Edition, ISBN- 9781179320647, Wiley, 1232 pages
- Hall, J.E (2015): *Guyton and Hall Text book of Medical Physiology*, 13th Edition, ISBN-9382956344, Vishal Publ. Co.



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Reproductive Health and Sex Education

ZOL5D01T Reproductive Health and Sex Education

Module I

Introduction (2 hrs.)

Definition; Reproductive health - problems and strategies; reproductive rights; importance of sex education for teen and youth.

Module II

Sex determination and Chromosomal anomalies (3 hrs) Chromosomal mechanism of sex determination; Barr body; twin studies; sex reversal; Sex chromosomal anomalies: Turner's syndrome and Klinefilter's syndrome.

Module III

Human Reproduction (17 hrs.)

Male reproductive system: Structure of testis, male accessory organs; Semen production and composition; ejaculation. Spermatogenesis. Female reproductive system: Structure of human ovary; development of primary follicle; structure of graafian follicle; fallopian tubes; uterus; external genitalia; mammary glands. Oogenesis. Menstrual cycle and hormonal control; brief account of fertilization, implantation, pregnancy, gestation, placenta, parturition and lactation (Brief account on hormonal control of lactation).

Module IV

Infertility and Assisted reproductive technologies (10 hrs.)

Infertility: Causes and problems in male and female. Infertility management: semen collection, preservation and storage, artificial insemination, surrogacy. Cryopreservation and embryo transfer: Collection, care and preservation of embryos. In vitro fertilization (IVF) and embryo transfer: Major steps; Test tube babies. Assisted Reproductive Techniques (ART): GIFT, ZIFT, ICSI, oocyte donation and embryo donation.



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Module V

Prenatal Diagnosis (4 hrs.)

Different methods: Ultrasonography, amniocentesis, chorionic villus sampling and alpha-foetoprotein estimation; female foeticide: ethical issues and laws (Mention– PNDT Act). [Short answers/Paragraphs]

Module VI

Fertility Control (4 hrs.)

Natural methods; artificial methods; chemical methods; hormonal methods; contraceptive devices; surgical contraception; abortion, legal termination of pregnancy.

Module VII

Sexually transmitted infectious diseases (7 hrs.)

Symptoms, mode of transmission, diagnosis, treatment and prophylaxis of AIDS, syphilis, gonorrhoea, herpes (genital), human papilloma virus and genital warts, hepatitis, gonococcal vulvo vaginitis, Trichomonal vaginitis. Mention the term venereal disease. Socio economic dimensions of STD.

Module VIII

Sexual orientation, sexual abuse and myths (5 hrs.)

Homosexuality and bisexuality (mention LGBT), oral sex, animal sex, cybersex, sexual abuse, premarital and extramarital sex, sexual perversions, paraphilia, child abuse, prostitution, sexual hygiene, protection of children from sexual offences (POCSO) Act, 2012 (brief account only), sexual myths.

Module XI

Ethical aspects of sex (2 hrs.)

Healthy relationship with opposite sex, role of counseling, gender discrimination in family and society.

Topics for Assignments/Seminars (Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Sexual counseling
2. Marriage counseling
3. Population explosion and birth control



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4. Functions of male and female hormones

5. Hormones of pregnancy

References

- Brian Walker Nicki R College Stuart Ralston and Ian Penman (2014): Davidson's Principles and Practice of Medicine, 22nd edition; eBook ISBN: 9780702052248, Elsevier
- John Hall (2015): Textbook of Medical Physiology; 13th Edition, ISBN: 9781455770052, Elsevier Health, 1168 pages
- Lynn L. Long, Judith A. Burnett, R. Valorie Thomas (2005): Sexuality counseling an integrated approach, 1st Edition, ISBN-10: 0131710524, Pearson
- Prakash Kothari (1995): Common sexual problems and solutions, 2nd Edition, ISBN10: 8185674086, UBS Publ. and Distributors Ltd., 173 pages
- Reisman, Judith A, Eichel, Edward W, Muir, J Gordon and Court, J H (John Hugh) (2001): Kinsey, sex, and fraud: the indoctrination of a people: an investigation into the human sexuality research, ISBN 10: 091031120X, Lochinvar-Huntington House
- Robert T. Francoeur (1982): Becoming a sexual person, ISBN-10: 0471078484, John Wiley and Sons, 836 pages
- Vander, Sherman and Luciano (2003): Human Physiology, 9th Edition, ISBN10: 9780072437935, McGraw Hill, 864 pages <http://www.biologydiscussion.com/essay/reproductive-health-in-human-problemsand-strategies/5167> <http://stayteen.org/sex-ed/article/why-sex-education-important> <http://www.onlymyhealth.com/importance-sex-education-among-youth-1301382451> <http://www.livestrong.com/article/246343-how-to-make-friends-with-the-oppositesex/> <http://stories.plancanada.ca/gender-discrimination-starts-at-home/>

SECTION C: ZOOGEOGRAPHY (8 hrs.)

Module IX

Zoogeographical realms and Biogeography of India (8 hrs.)



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Geographical Distribution

(4 hrs.)

(a) Geographical distribution of animals: Cosmopolitan, discontinuous, bipolar and isolated distribution.

(b) Barriers in animal distribution: Physical, climatic and biological barriers.

Zoogeographical realms

(2 hrs.)

Zoogeographical regions with specific fauna (faunal regions): Palaearctic region, Nearctic region, Neotropical region, Ethiopian region, Oriental region and Australian region; brief description on Wallace line, Weber line and Wallacea.

Insular fauna

(1 hr.)

Faunal characteristics of continental (Madagascar and Sri Lanka) and oceanic islands (Galapagos and New Zealand).

Biogeography of India

(1 hr.)

Biogeographical zones of India: Himalayan, Desert zone, Semi-arid zone, Western Ghats, Deccan plateau, Gangetic

Topics for Assignments / Seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Old theories on origin of life:
 - i) Theory of abiogenesis
 - ii) Theory of biogenesis
 - iii) Theory of special creation
 - iv) Theory of Panspermia.
2. Evolution of Vertebrate Groups: Evolution of agnathans, fishes, amphibians, reptiles, birds and mammals (brief account).
3. Evolution of horse
4. Polyploidy and Evolution
5. Ancestry of human population of India



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References

Module 1-2 (Ethology)

- Jerry A. Hogan. 2017. *The Study of Behavior: Organization, Methods, and Principles*. ISBN: 9781107191976. Cambridge University Press. 380 pages.
- John Alcock & Dustin R Rubenstein. 2019. *Animal Behaviour*, 11th edition. Published by Sunderland, Massachusetts Sinauer Associates, Oxford University Press. 672 pages.
- Lee Alan Dugatkin. 2013. *Principles of Animal Behavior*, 4th Edition. ISBN-13: 978-0393920451. ISBN-10: 0393920453. W. W. Norton & Company. 576 pages.
- Michael Breed & Janice Moore. 2015. *Animal Behaviour*. Second Edition. ISBN: 9780128015322. Academic Press. 552 pages.
- V. K. Agarwal. 2010. *Animal Behaviour (Ethology)*. ISBN: 9788121932103, 8121932106. S.Chand Publishers. 400p.

Module 3-8 (Evolution)

- Brian K. Hall & Benedikt Hallgrímsson. 2014. *Strickberger's Evolution*. 5th Edition. ISBN: 9789380853789, 9380853785. Publisher: Viva. 672 pages.
- Darlington P J 1966. *Zoogeography: The Geographical Distribution of Animals*. Fourth Edition. John Wiley & Sons, Inc. 675 pages.
- Jain P C & M.S. Anantharaman. *Palaeontology (Palaeobiology): Evolution and Animal distribution*. 9th Edition. ISBN-10: 9382956441; Vishal Publishing Co.
- James H. Brown. 1996. *Biogeography*. ISBN-10: 0697243591; ISBN-13: 978-0697243591. William C Brown Pub., 643 pages.
- James T. Costa. 2009. *The Annotated Origin – A Facsimile of the First Edition of On the Origin of Species*. ISBN-10: 0674032810; University Press; Annotated edition. 546 pages.
- Niles Eldredge. 1985. *Time Frames: The Rethinking of Darwinian Evolution and the Theory of Punctuated Equilibria*. ISBN-10: 0671495550; Simon & Schuster. 240 pages.
- Niles Eldredge. 1998. *Pattern of Evolution*. ISBN-10: 0716730464; ISBN-13: 978-0716730460.



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W H Freeman & Co. 219 pages.

- Richard Dawkins. 2006. *The Blind Watchmaker – Why the Evidence of Evolution Reveals a Universe without Design*. ISBN-10: 0393315703; W. W. Norton & Company. 496 pages.
- Robert Andrew Foley & Roger Lewin. 2003. *Principles of Human Evolution 2nd Edition*. ISBN-10: 0632047046; ISBN-13: 978-0632047048. Wiley-Blackwell. 568 pages.
- Solomon Stevens. 2017. *Evolutionary Biology*. ISBN-10: 1635491169. ISBN-13: 978-1635491166. Larsen and Keller Education. 190 pages.

Module 9 (Zoogeography)

- Andrews, M.I. & Joy, K.P. *Ecology, Evolution & Zoogeography*. S.M. Book Depot, Changanassery
- Rastogi V. B. & Jayaraj. 1998. *Animal Ecology and Distribution of Animals*. Kedar Nath and Ram Nath. ISBN: 5551234001809.
- Tiwari, S. K. 1985. *Zoogeography of India and South East Asia*. CBS Pubs, New Delhi

Cell Biology and Genetics

ZOL5B06T Cell Biology and Genetics

SECTION A: CELL BIOLOGY (27 hrs.)

Module I

Techniques in Cell Biology (7 hrs.)

Microscopy (4 hrs.)

Light microscope: principles and uses; use of oil immersion objective. Types of light Microscopes: Bright-field, Phase contrast and Fluorescence microscope. Camera lucida: Principle and uses. Micrometry. Electron microscope: Principle, applications; advantages and disadvantages. Principles and applications



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of - Scanning Electron Microscope (SEM); Scanning-tunnelling microscope and Atomic force microscope
Histological Techniques (2 hrs)

Preparation of materials for light microscopy (for temporary and permanent mounts): Fixation: common fixatives: buffered formalin, ethanol, Bouin's solution and Carnoy's fluid (mention composition). Processing of the fixed tissue: mention dehydration, infiltration, and embedding. Sectioning: Rotatory microtome (brief description), uses. Staining: Mention deparaffinization, hydration, staining, dehydration and mounting. Histological stains: Haematoxylin and Eosin. Vital stains: Neutral red and Janus green.

Histochemical Techniques (1 hr.)

Mention the techniques for the demonstration of proteins (mercuric bromophenol blue method), carbohydrates (PAS) and lipids (Sudan)

Module II

Structure of eukaryotic cell (12 hrs.)

Plasma membrane (6 hrs.)

Chemical composition and structure (unit membrane concept and fluid mosaic model), membrane lipids and membrane fluidity; significance of membrane fluidity; membrane proteins-integral proteins, peripheral proteins and lipid-anchored proteins; membrane carbohydrates. Interactions between cells and their environment – extracellular space, glycocalyx, extracellular matrix - Mention basal lamina, collagen, fibronectin, proteoglycans and laminins. Interaction of cells with other cells – cell adhesion molecules, selectins, immunoglobulins, integrins and cadherins. Modifications of the plasma membrane – microvilli, desmosomes, nexuses, tight junction and gap junction. Functions: trans-membrane transport mechanisms – diffusion, osmosis, active transport, ion transport (channels), co-transport, bulk trans-membrane transport – exocytosis, endocytosis. Membrane receptors: Mention insulin receptor.

Mitochondria (2 hrs.)

Ultra-structure; mitochondrial membranes; functions of mitochondria; Biogenesis of mitochondria.

Lysosomes (1 hr.)



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Structure and function; polymorphism in lysosomes, lysosomal enzymes. Concept of GERL (Golgi body – Endoplasmic Reticulum – Lysosome complex).

Cytoskeleton (1 hr.)

Location, ultrastructure, biochemical composition and functions of microfilaments, intermediate filaments and microtubules.

Interphase nucleus (2 hrs.)

General structure and functions; nucleo-cytoplasmic index; ultrastructure of nuclear membrane and nuclear pore complex (NPC), functions of NPC; Nucleoplasm - Composition and function; Nucleolus - Structure, composition, nucleolar organizer, nucleolar cycle and functions of nucleolus. Chromatin: Euchromatin and heterochromatin.

Module III

Structure of chromatin (2 hrs.)

Nucleosome organization and higher order structures; Chromosome structure; Giant chromosomes - Polytene chromosomes: structure, puffs and bands; Endomitosis; significance. Lamp brush chromosomes: structure, loops and significance.

[Short answers/Paragraphs]

Module IV

Cell Cycle & Cell division (4 hrs.)

Cell Cycle: G1, S, G2 and M phases – Check points; G0 phase. Cell division: Amitosis (brief account); Mitosis: description of all stages, cytokinesis and significance; Meiosis: description of all stages and significance. Role of centriole in animal cell division.

Module V

Cancer and Apoptosis (2 hrs.) Characteristics of cancer cells; causes of transformation; protooncogenes and tumor suppressor genes and their role in transformation. Apoptosis, mechanism of apoptosis and its significance.

SECTION B: GENETICS (27 hrs.)



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Module VI

Interaction of genes (5 hrs.)

Allelic interactions: incomplete dominance and co-dominance with examples. Nonallelic interactions: epistasis (inheritance of plumage colour in poultry), mention dominant and recessive epistasis. Supplementary genes (example: inheritance of comb pattern in poultry). Complementary genes, mention any one example. Polymeric genes, mention one example. Duplicate genes, mention one example. Modifying genes. Atavism, Penetrance and Expressivity. Polygenic (quantitative) inheritance (example: skin colour in man).

Module VII

Multiple alleles (4 hrs.)

Definition and characteristics; example: coat colour in rabbits. Blood group genetics: ABO blood group system; MN blood group and Bombay phenotype. Inheritance of Rh factor; mention erythroblastosis foetalis. Problems related to blood group inheritance (5 problems). Isoalleles, mention any one example.

Module VIII

Linkage and Recombination (8 hrs.)

Definition and characteristics of linkage groups, Morgan's work on Drosophila. Types of linkage: complete and incomplete - examples; Linkage groups. Crossing over and recombination, Calculation of Recombination Frequency and Percentage; Linkage map, Map Distance; Mitotic Recombination (brief). Sex-Linked Characteristics: Types of sex-linkage - X linked characters - Colour blindness and haemophilia in humans, holandric genes – hypertrichosis. Dosage compensation – Barr body – Lyon hypothesis. Sex-Influenced and Sex-Limited Characteristics. Sex Differentiation: Testis-determining factor (TDF), Müllerian inhibition factor. Disorders of Sexual Development (short notes) - XX males and XY females, Point mutations in the SRY gene and testicular feminization.

Module IX

Sex determination (3 hrs.)



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Chromosomal mechanism of Sex-Determination: Male heterogametic and female heterogametic mechanism of sex determination. Genic Sex Determining Systems - Genic balance (ratio) theory of Bridges. Haploid-diploid mechanism of sex determination, honey bee as example. Environmental Sex Determination: Example – Bonellia, Crocodile. Hormonal influence on sex determination: Example - sex reversal in fowl and free martin in cattle; Gynandromorphism – types and causes. Intersex (brief).

Module X

Mutations (3 hrs.)

Chromosome mutations: numerical (euploidy and aneuploidy) and structural changes (deletion, duplication, insertion, inversion, translocation). Gene mutations: types- spontaneous, induced, somatic, gametic, forward and reverse. Types of point mutations- deletion, insertion, substitution, transversion and transition. Mutagenesis- Natural and artificial mutagenesis, Mutagenic agents: a) UV radiation and ionising radiation b) Base analogues, alkylating and intercalating agents.

Module XI

Human Genetics and Genetic counselling (4 hrs.)

Classification and grouping of human chromosomes (Patau's scheme). Chromosomal anomalies and disorders: Autosomal - (Down's, Patau's, Edward's and Cri du Chat syndromes). Sex chromosomal - (Turner's and Klinefelter's syndromes). Gene mutations: Autosomal mutation - albinism, PKU, alkaptonuria, galactosemia, Tay-Sach's syndrome, Gaucher's disease, Sickle cell anaemia, thalassemia and brachydactyly. Sex chromosomal mutations: haemophilia, Lesch– Nyhan syndrome, dermal hypoplasia. Polygenic traits: cleft palate / lip, club foot and hydrocephaly. Eugenics, Euthenics and Euphenics.

Topics for assignments/seminars

(Topics allotted for assignments/ seminars should be considered for internal assessments only, and can be subdivided among students)

1. Ribosomes: structure and functions
2. Golgi bodies: structure and functions



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3. Cytoplasmic or extra nuclear inheritance:

- a) Shell coiling in Limnaea
- b) Endo-symbionts like kappa particle and sigma.

4. Mendel’s experiments on pea plants

5. Mendel’s laws of inheritance

References

Module 1-5 (Cell Biology)

- De Roberti’s EMF (2011): Cell and molecular biology; 8th Edition, ISBN- 9780781734936 0781734932, Lippincott Williams & Wilkins, 734 pages
- Gerald Karp (2013): Cell Biology; 7th Edition, ISBN-10: 1118318749, Wiley, 872 pages
- Gupta, P. K. (2018): Cell and Molecular Biology, Revised 5th edition, ISBN, 978-93-5078-154-8, Rastogi Pubs.,1192 pages
- Kleinsmith, L. J. & Kish, V. M. (1995): Principles of Cell and Molecular Biology, 2nd Edition, ISBN-10: 0065004043 Harper Collins College Pubs, 809 pages
- Niel O. Thorpe (1984): Cell Biology. ISBN-10: 0471805246, John Wiley & Sons, 752 pages
- Philip Sheeler and Donald E. Bianchi (1983): Cell Biology – Structure, Biochemistry and Functions; 2nd Edition, ISBN-10: 0471889075, John Wiley & Sons, 688 pages
- Sharma, A. K. & Sharma, A. (1980): Chromosome Techniques; 3rd Edition, ebook ISBN: 9781483100845, Butterworth, 724 pages
- Verma, P.S. & Agarwal, V.K. (1999): Cytology. S., Chand & Co., 504 pages Module 6-11 (Genetics)
- Brooks, R. J. (2008): Genetics: Analysis and Principles.3rd Edition, ISBN-10: 0071287647, Irwin/McGraw-Hill, 844 pages
- Gardner, E. J., Michael J. Simmons and Peter Snustad (2006): Principles of Genetics. 8th Edition, ISBN-10: 8126510439, Wiley, 740 pages
- Good Enough, U. (1979): Genetics. 2nd Revised edition, ISBN-10: 003050886X, Holt R&W



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- John Ringo (2004): Fundamental Genetics- Online ISBN 9780511807022 Cambridge University Press, 462 pages
- Peter Snustad & Michael J. Simons (2011): Principles of Genetics;6th Edition, ISBN 1118129210, JW & S, 784 pages
- Read Andrew and Dian Donnai (2015): New Clinical Genetics, 3rd Edition, ISBN10: 0073525308, McGraw Hill, 480 pages
- Ricki, L. (2011): Human Genetics: Concepts and Applications. 10th Edition, WCB MGH
- Robert H. Tamarin (1998): Principles of Genetics, 6th Edition, ISBN-10: 0697354628 William C Brown Pub, 680 pages
- Tom Strachan and Andrew Read (2018): Human Molecular Genetics,5th Edition, ISBN 9780815345893 JW & S, 770 pages

DEVELOPMENTAL BIOLOGY AND ENDOCRINOLOGY

1. Induced ovulation in fish.
2. Identification of different developmental stages of frog - Egg, blastula, gastrula; - neurula, tadpole external gill and internal gill stage.
3. Vital staining of chick embryo.
4. Preparation of temporary/permanent whole mounts of chick embryo of the following stages to study the extent of development of the circulatory and nervous system in detail in 20, 24, 33, 49 & 72 hours of incubation.
5. Tracing the development of stained parts. candling, identification of blastoderm, window preparation - staining using stained agar strips and following the development.
6. Preparation of stained temporary/permanent mounts of larvae.
7. Experimental analysis of insect development - Drosophila.
8. Regeneration studies in frog tadpole tail. 9. Demonstration of sperm of rat/calotes/frog.



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10. Morphological and histological studies of different types of placenta in mammals.

11. Hormones in Amphibian metamorphosis - Thyroxine/Iodine solution.

12. Inre of early chick embryo in vitro.

13. Sdy of invertebrate/vertebrate larval forms (minimum 7). I {- okraion of the mid-sagittal sections and cross sections of the chick embryo through head/ heart region of 24,48 & 56 hours of incubation.

References:

1. Adamstone, E. B. and Waldo Shumway (1954). 3 Ed. A Laboratory Manual of Vertebrate Embryology. John Wiley & Sons, Inc.
2. Roberts Rugh (1961). Laboratory Manual of Vertebrate Embryology. Indian Ed., Allied Pacific hit. Ltd.
3. Browden, L. W., Erikson, C. A., and Jeffery, R. W. (1991). Developmental Biology' 3 Ed., Saunders College Publi., Philadelphia.
4. Zanol, M. X., Yochim, J. M., Mc Carthy, T. L. and Sanborn, R. C. (1964). Experimental Endocrinology: A source book of basic Techniques. Academic Press, New York.
5. Thomas, J. A. (1996). Endocrine methods. Academic press, New York.
6. Humason, G.L. (1962). Animal Tissue techniques. W. H. Freeman & Co.

BIOTECHNOLOGY

1. Isolation of genomic DNA
2. Separation of DNA by electrophoresis.
3. Bacterial transformation.
4. PCR
5. Cell immobilization.

MICROBIOLOGY

1. Selective isolation and enumeration of bacteria.
2. Bacterial staining technique
 - a. Simple staining of bacteria.



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- b. Negative staining
- c. Hanging drop technique.
- d. Gram staining.
- e. Endospore staining.

- 3. Turbidity test for contamination of milk.
- 4. Preparation of media and sterilization.eg: Nutrient agar, MacConkey agar,
- 5. Cultivation of yeast and molds
- 6. Bacteriological analysis of water e.g., fecal pollutants.
- 7. Antibiotic sensitivity test.
- 8. Maintenance of E coli.culture (shake and surface cultures) and quantitative evaluation (number of cells/ml) of a given sample of culture by dilution and plating.

MICROTECHNIQUE AND HISTOCHEMISTRY

- 1. Preparation of stained and unstained whole -mounts.
 - 2. Identification of the various tissues of animals in serial sections prepared using nuclear and cytoplasmic stains.
 - 3. Processing a few types of tissues for the histochemical staining-Staining of serial sections to show the presence of
 - a) Carbohydrates by PAS method
 - b) Proteins by Mercuric bromophenol blue method
 - c) Fats by Sudan Black B method
 - d) DNA by Feulgen Technique. Submission: Stained/unstained
- Whole mounts - 4 numbers
 Double stained serial histology slides - 4 numbers
 Histochemical slides - 2 numbers



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

ECOLOGY AND ETHOLOGY

1. Identification of marine plankton.
2. Quantitative estimation of marine plankton.
3. Estimation of BOD in polluted water sample.
4. Estimation of salinity in water samples.
5. Estimation of nitrate-nitrogen in water samples.
6. Separation and identification of soil arthropods using Berlese funnel'
7. Determination of moisture content of soil sample'
8. Determination of water holding capacity of soil sample.
9. Testing the transparency of water using Secchi disc
10. Determination of primary productivity in pond water using light and dark bottle.
11. Study of termite / ant colony
12. Principle and application of the following instruments-GPS, Thermo hygrometer, Altimeter, Air samplers, Water samplers, Soil samplers, Berlese funnel, Lux meter' anemometer, Rain gauge, Plankton net, Plankton counting chamber, Weather balloon, Secchi disc etc. (at least six items)
- ii. Studying and reporting the behaviour and ecology of animals in selected fields (Social sparrow/white babbler/white headed babbler or Bonnet Macaques)
13. Foraging behaviour of ants.
14. Study of circadian rhythm
15. Behavioural reaction to moisture and light

FIELD STUDY

A study tour of at least five days duration (need not be at a stretch) to observe the ecology and behaviour of animals should be undertaken. The places of visit shall include inter tidal region, freshwater bodies, lakes, rivers, hills, streams, wetlands, mangroves, forests, grasslands, drinking water treatment, plants, and



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sewage treatment plants. A "p-ort of th" n "ld study is to be included in the practical record to be submitted at the tirne of examination.

References:

- 1- NC Aerry' N.c. (2010)- A manual of environmental analysis. Ane books private limited.
- 2- Gmdenough, J; McGuire B. and Robert, W. (1993) perspectives on Animal Behaviour. John Wiley and Sons, Lond.
- 3 -} {aming, A. (1967) An Introduction to Animal Behaviour. Edward Arnold pub.,London. {-
- 4- {anning, A. and Dawkins,M.s.(1995).An introduction to Animal Behaviour, iambridge Press.
- 5- Bonnie,J,Plager and Ken Yamkawa (2003). Exploring Animal Behaviour in and Field. Academic press.
- 6- Michael, P. (1984). Ecological methods for field and laboratory investigations. Tata McGraw Hill publishing co.
- 7-Webbet' wJ (1972). Physicochemical Processes for water quality control. Wiley. interscience. t- cnrgp r Fra*lin, L. Burton and David, s.H.(2002). waste water Engineering Metcalf and Eddy.et ed. Inc. Tata McGraw Hill publishing co. Laboratory



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Pre-Modern Kerala: Problems and Perspectives

HIS1C02 Pre-Modern Kerala: Problems and Perspectives

Module I

Historical Consciousness in Pre-Modern Kerala

Parasurama and Cheraman Perumal Legend-Keralolpatti tradition – Mushakavamsa Kavya – Tuhfat al - Mujahidin – Oral Tradition as history – Ballads- War songs- Chengannurati paattu.

Sources and texts for Study

- A] Archaeological **Sources**- typology and nature of evidences- text for study: Pattanam as a trade settlement in the Reports of Pattanam excavation.
- B] Epigraphical **Sources**- script –chronology- content and language of inscriptions-text for study – Tarisapalli Copper plates.
- C] **Grandhavaris**- text for study – description of sthanarohanam in Kozhikodan granthavari.
- D] **Numismatics**– Typology – Greco–Roman and indigenous Coins in Kerala- text for study – Early Coins in Kerala – P L Gupta.
- E] Literary **Sources**- Sanskrit, Tamil –Manipravalam, Arabic and Malayalam texts- text for study description of Social Life in Malabar in section three, Tuhfat ul Mujahiddin.

Module II

Kerala as a region and social formation process

Human ecology and settlements- life activities and multiple economies in early historic Iron Age Kerala- clan and chiefdoms- transition from early historic to early medieval –formation of agrarian society–land, labour and production process- Brahman settlements, temples and social stratification - labour process and formation of kutis and adiyar groups- primary producers- trade and exchange pattanam, nagaram and angadis- overseas trade- formation of caste hierarchy and brahmanical codes – kachhams and maryadais.

Module III



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Forms of political and social power

Polity of the Nattodayavars- overlordship of Chera Perumals- nature of the Chera power – debate – evidences and theories.

Module IV

Post Perumal polity and socio-economic power structure.

Naduvazhi Swarupams- janma kana maryada system-state formation in Travancore and Cochin political structure under the Zamorins – jati hierarchy and process of social exclusion- caste oppression and practice of untouchability-**gender relations** –European powers–Kerala as a linguistic and cultural region-formation of Malayali identity.

History Of Modern Kerala: Problems and Perspectives

HIS2C02 History of Modern Kerala: Problems and Perspectives

Module I

Colonial and modern historiography

Early Surveys and Administrators- Buchanan - Missionary Writings – Samuel Matteer and Gundert Gazetteers and Manuels- William Logan, Nagam Aiya and Velu Pillai- search for Primary sources – Babington, Bruce Foot- colonial ethnography – Edgar Thurston and L K Anantha Krishna Aiyar. Histories of princely states – Travancore and cochin-Emergence of modern Historiography- K P Padmanabha Menon – imagination of historical past of Kerala by the social reformers and nationalists- development of scientific histories- emerging trends in history writings in Kerala **ecology and environmental histories** – **women and gender history** – Dalit subaltern history- peasant history-history of caste slavery- history of communities - local history- intersectional histories – critical histories.

Module II



CRITERION	I	Curricular Aspects
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Modern Kerala and the phases of change

Kerala in the 18th century -changes in the economy and society -Mysorean rule in administration and land relations - colonialism in Kerala- from trade to conquest- changes in property and legality - governance and administrative practices- missionary activism in social life - changes in agriculture- industry and social classes-formation of public sphere.

Module III

Social modernization and reform process

Caste and social reform-religious reform- the idea of ‘Renaissance’ – lower caste protests and the radical agenda in the reform process- social reformers and their positions and strategies-- notions of historical past by reformers- Poykayil Appachan and Chattampi swamikal - Literature and social imaginations -novel as historical knowledge- Indulekha and Saraswathi Vijayam.

Module IV

Formation of united Kerala

National movement and radical politics -popular movements –formation of united Kerala- land reform and its consequences- land reform and landlessness among the Adivasis and Dalits development experiences- literacy and health care- socio-economic inequality and Kerala model development.

History And Theory

HIS2C01 History and Theory

Module I

Enlightenment and the perception of historical past

– Vico- Hume and Herder- Romanticism Nationalism - Positivism and History as Science- Rankean Positivism -Critics of positivism Hegelian philosophy of History.

Module II



CRITERION	I	Curricular Aspects
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History and Classical Social theory

Weber and ideal type - Durkheim and Social Fact. –Marx and Historical Materialism – modes of production - Structural Marxism – Critical theory – Social History –Historical Anthropology - New Historicism- Human Geography –

Module III

The Annales

the Agenda of Total History- Braudelian Concepts of Structures – Conjuncture and Event - history of mentalities and emotions- History from Below- Histories of Oppression – Gender **History** – History of Slavery – History of South Asian Caste system.

Module IV

Methodological Debates and Contemporary Trends

- Methodological Individualism and Holism - Structure and Agency- Essentialism and Relativism – Truth and Objectivity -Foucault and the history of power - Bourdieu and Reflexive Social Science – Indian Debate on Experience and Theory- Gopal Guru and Sundar Sarukkai.



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Basic Logic & Number Theory

MTS1B01 Basic Logic & Number Theory

Module-I Text (1) (12 hrs)

1.1 : Propositions- *definition, Boolean (logic) variables, Truth Value, Conjunction, Boolean expression, Disjunction (inclusive and exclusive), Negation, Implication, Converse, Inverse and Contra positive, Bi-conditional statement, Order of Precedence, Tautology Contradiction and Contingency* [‘Switching Networks’ omitted]

1.2 : Logical equivalences- *laws of logic* [‘Equivalent Switching Networks’ ‘fuzzy logic’ & ‘Fuzzy decisions’ omitted]

1.3 : Quantifiers- universal & existential, predicate logic

1.4 : Arguments- valid and invalid arguments, inference rules

1.5 : Proof Methods – *vacuous proof, trivial proof, direct proof, indirect proof- contrapositive & contradiction, proof by cases, Existence proof- constructive & non constructive, counter example*

Module-II Text (2) (22 hrs)

1.3 : Mathematical induction- well ordering principle, simple applications, weak version of principle of mathematical induction, illustrations, strong version of induction (second principle of MI), illustration

1.4 : Recursion- recursive definition of a function, illustrations.

2.1: The division algorithm – *statement and proof, div & mod operator, card dealing, The two queens puzzle (simple applications), pigeonhole principle and division algorithm, divisibility relation, illustration, divisibility properties, union intersection and complement-inclusion-exclusion principle & applications, even and odd integers.*

2.5: Prime and Composite Numbers- definitions, infinitude of primes, [‘algorithm 2.4’ omitted] The sieve of Eratosthenes, a number theoretic function, prime number theorem



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(statement only), distribution of primes (upto and including Example 2.25) . [rest of the section omitted]

Module-III Text (2) (15 hrs)

3.1 : Greatest Common Divisor- gcd, symbolic definition, relatively prime integers, Duncan’s identity, Polya’s theorem, infinitude of primes, properties of gcd, linear combination, gcd as linear combination, an alternate definition of gcd, gcd of n positive integers, a linear combination of n positive integers, pairwise relatively prime integers, alternate proof for infinitude of prime.

3.2 : The Euclidean Algorithm- The Euclidean algorithm [algorithm 3.1 omitted], A jigsaw puzzle, Lamé’s theorem (statement only; proof omitted)

3.3 : The Fundamental Theorem of Arithmetic- Euclid’s lemma on division of product by a prime, fundamental theorem of arithmetic, Canonical Decomposition, number of trailing zeros, highest power of a prime dividing n!, [only statement of Theorem 3.14 required; proof omitted] Distribution of Primes Revisited, Dirichlet’s Theorem(statement only)

3.4 : Least Common Multiple- definition, canonical decomposition to find lcm, relationship between gcd and lcm, relatively prime numbers and their lcm

3.5: Linear Diophantine Equations – LDE in two variables, conditions to have a solution, Aryabhata’s method, number of solutions, general solution, Mahavira’s puzzle, hundred fowls puzzle, Monkey and Coconuts Puzzle, [‘Euler’s method for solving LDE’s ‘ omitted] Fibonacci numbers and LDE, LDE in more number of variables and their solutions- Theorem 3.20

Module-IV Text (2) (15 hrs)

4.1 : Congruences - congruence modulo m, properties of congruence,



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characterization of congruence, least residue, [‘Friday-the-Thirteenth’ omitted], congruence

classes, A Complete Set of Residues Modulo m , properties of congruence, use of congruence to find the remainder on division, [‘Modular Exponentiation’ method omitted], Towers of Powers Modulo m , further properties of congruence and their application to find remainder [‘Monkey and Coconut Puzzle revisited’ (example 4.17) omitted] congruences of two numbers with different moduli

4.2 :Linear Congruence- solvability, uniqueness of solution, incongruent solutions, Modular Inverses, applications

5.1: Divisibility Tests-Divisibility Test for 10, Divisibility Test for 5, Divisibility Test for 2, Divisibility Tests for 3 and 9, Divisibility Test for 11 [rest of the section from Theorem 5.1 onwards omitted]

7.1 : Wilson’s Theorem- self invertible modulo prime, Wilson’s theorem and its converse [‘ Factorial, Multifactorial and Primorial Primes’ omitted]

7.2 :Fermat’s Little Theorem (FLT)- FLT and its applications, [Lagrange’s alternate proof of Wilson’s theorem omitted], inverse of a modulo p using

FLT, application-solution of linear congruences [‘ Factors of $2^n + 1$

omitted], extension of FLT in various directions [‘The Pollard $p-1$ factoring method’ omitted]

7.4: Euler’s Theorem- motivation, Euler’s Phi Function φ , Euler’s Theorem, applications, generalisation of Euler’s theorem (Koshy)

References:



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1	Susanna S Epp: Discrete Mathematics with Applications(4/e)
2	Kenneth H. Rosen: Discrete Mathematics and Its Applications(7/e)
3	David M. Burton : Elementary Number Theory(7/e) <i>McGra w-Hill (2011) ISBN: 978-0-07-338314-9</i>
4	Gareth A. Jones and J. Mary Jones: Elementary Number Theory, <i>Springer Undergraduate Mathematics Series(1998) ISBN:</i>
5	Underwood Dudley :Elementary Number Theory(2/e),
6.	James K Strayer: Elementary Number Theory, <i>Waveland Press, inc. (1994), ISBN:978-1-57766-224-2</i>
7	Kenneth H. Rosen: Elementary Number Theory(6/e), <i>Pearson Education(2018)ISBN: 9780134310053</i>

Linear Programming

MTS5 B 08 Linear Programming

Module-I (16 hrs)

Chapter1 Geometric Linear Programming: Profit Maximization and Cost Minimization, *typical motivating examples, mathematical formulation, Canonical Forms for Linear Programming Problems, objective functions, constraint set, feasible solution, optimal solution* , Polyhedral Convex Sets, *convex set, extreme point, theorems asserting existence of optimal solutions, The Two Examples Revisited, graphical solutions to the problems, A*



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Geometric Method for Linear Programming, *the difficulty in the method*, Concluding Remarks

Chapter2 The Simplex Algorithm:- Canonical Slack Forms for Linear Programming Problems; Tucker Tableaus, *slack variables, Tucker tableaus, independent variables or non basic variables, dependent variables or basic variables*, .An Example: Profit Maximization, *method of solving a typical canonical maximization problem*, The Pivot Transformation, *The Pivot Transformation for Maximum and Minimum Tableaus*, An Example: Cost Minimization, *method of solving a typical canonical minimization problem*,The Simplex Algorithm for Maximum Basic Feasible Tableaus, The Simplex Algorithm for Maximum Tableaus, Negative Transposition; The Simplex Algorithm for Minimum Tableaus, Cycling, Simplex Algorithm Anti cycling Rules, Concluding Remarks

Module-II (14 hrs)

Chapter3 Non-canonical Linear Programming Problems:- Unconstrained Variables, Equations of Constraint, Concluding Remarks

Chapter 4 : Duality Theory :- Duality in Canonical Tableaus, The Dual Simplex Algorithm, *The Dual Simplex Algorithm for Minimum Tableaus, The Dual Simplex Algorithm for Maximum Tableaus*, Matrix Formulation of Canonical Tableaus ,The Duality Equation, Duality in Noncanonical Tableaus, Concluding Remarks

Module-III (18 hrs)

Chapter 5 Matrix Games:- An Example; Two-Person Zero-Sum Matrix Games,Domination in a Matrix Game, Linear Programming Formulation of Matrix Games, The Von Neumann Minimax Theorem, The Example Revisited, Two More Examples, Concluding Remarks

Chapter 6 Transportation and Assignment Problems :- The Balanced Transportation Problem, The Vogel Advanced-Start Method (VAM), The Transportation Algorithm, Another Example, Unbalanced Transportation Problems, The Assignment Problem,



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The Hungarian Algorithm, Concluding Remarks, The Minimum-Entry Method, The Northwest-Corner Method

References:

1	Robert J. Vanderbei: Linear Programming: Foundations and Extensions (2/e) Springer Science+Business Media LLC(2001) ISBN: 978-1-4757-5664-7
2	Frederick S Hiller, Gerald J Lieberman: Introduction to Operation Research(10/e) McGraw-Hill Education, 2 Penn Plaza, New York(2015) ISBN: 978-0-07-352345-3
3	Paul R. Thie, G. E. Keough : An Introduction to Linear Programming and Game Theory(3/e) John Wiley and Sons, Ins.(2008) ISBN: 978-0-470-23286-6
4	Louis Brickman: Mathematical Introduction to Linear Programming and Game Theory UTM, Springer Verlag, NY(1989) ISBN: 0-387-96931-4
5	Jiri Matoušek, Bernd Gartner: Understanding and Using Linear Programming Universitext, Springer-Verlag Berlin Heidelberg(2007) ISBN: 978-3-540-30697-9

Applied Calculus

MTS5D01 Applied Calculus

Module I 16 hrs

Chapter 1:- Functions, Graphs, and Limits 1.1: Functions

1.2: The Graph of a Function 1.3: Linear Functions 1.4: Functional Models

1.5: Limits

1.6: One sided limits and continuity Chapter



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2:- Differentiation: Basic Concepts

2.1: The Derivative

2.2 : Techniques of Differentiation

2.3 : Product and quotient rules: Higher order derivatives [proof of product and quotient rules omitted]

2.4 : The Chain rule [proof of general power rule omitted]

Module II 18 hrs

2.5 : Marginal Analysis and Applications using increments

2.6: Implicit Differentiation and Related Rates

Chapter3:- Additional Applications of Derivative

3.1: Increasing and Decreasing Functions; Relative Extrema, 3.2: Concavity and Points of Inflection

3.1 Optimization; Elasticity of Demand

3.5: Additional Applied Optimization

Chapter4: Exponential and Logarithmic Functions

4.1: Exponential functions; **continuous compounding**

4.2: Logarithmic functions

Module III 14 hrs

Chapter5:- Integration

5.1: Anti-differentiation: The Indefinite Integral

5.2 : Integration by Substitution

5.3 : The Definite Integral and the Fundamental Theorem of Calculus [*only statement of FTC required; Justification given at the end of the section omitted*]

5.5: Additional Applications to Business and Economics



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5.6: Additional Applications to the Life and Social Sciences [The derivation of volume formula omitted; only the formula and its applications required]

References:

1	Soo T Tan: Applied Calculus for the Managerial, Life, and social sciences(8/e) <i>Cengage Learning(2011) ISBN: 978-0-495-55969-6</i>
2	Ron Larson : Brief Calculus <i>An Applied Approach(8/e) Houghton MifClin Company(2009)ISBN: 978-0-618-95847-4</i>
3	Stefan Waner, Steven R. Costenoble: Finite Mathematics and Applied Calculus(5/e) <i>Brooks/Cole Cengage Learning(2011) ISBN: 978-1-4390-4925-9</i>
4	Frank C. Wilson, Scott Adamson: Applied Calculus <i>Houghton MifClin Harcourt Publishing Company(2009)</i>
5	Geoffrey C. Berresford, Andrew M. Rockett: Applied Calculus(7/e)



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Communication Skills In English

FEN1B01 Communication Skills In English

Module I: Communication Theory

Communication- Brief History of Human Communication-Meaning- Importance and Process- Characteristics of Communication-Objectives –Types of Communication-Verbal & Non-Verbal Communication- Models of Communication and Modeling: Linear Model & Transactional Model- Communication Competence.

Module II: Day-to-day English

At a restaurant-ordering, offering, polite questions- At a bus stop- making requests, enquiring, giving suggestions, asking for directions-At a hospital-seeking help, giving instructions- At a school/college-encouraging, expressing probability, obligations.

Module III: Oral communication skills

Presentations Skills (pair/single)- specific language/expressions for starting a presentation- introducing a point-listing ideas-comparing and contrasting-concluding a topic. Mock TV News Reading-pitch-intonation, rhythm-Preparing and presenting short skits-enacting scenes from dramas. Preparing and delivering speeches-welcome, inaugural, presidential and vote of thanks- extempore speeches-Evaluating oral presentations.

Module IV: English for Discussion/Debating Skills

Group Discussion- (controlled, guided and free) guidelines-polite expressions for disagreeing, agreeing, adding, interrupting, suggesting-Mock Press Conference-Polite expressions for seeking/ expressing opinions in formal contexts- Demonstration-(language focused like cookery show, introducing a product, its function etc) vocabulary and structures used in this.

Core Texts

Taylor, Grant. Situational Conversational Practise. New Delhi: Tata Macgraw Hill, 1975. Sunitha K.S, Annie Pothan & Sumitha Joy. Communication Skills for English Conversation Practice: A Practice Guide to Improve Conversation Skills. New Delhi: Sterling Publishers 2006.

Suggested Reading

Kennedy, Chris and Rod Bolitho. English for Specific Purpose. London : Macmillan, 1984 Gaber, Don.How to Start a Conversation and Make Friends. New Delhi: Sudha Publication. 1994.
Thomson, Neil. Communication and Language: A Handbook of Theory and Practice. Palgrave Macmillan, 2003



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Practice Workbook - Premanand M E & Prasanth V G et al. Nuts and Bolts of English. Dept. of English, 2017. ISBN 978-81-920171-3-6

Advanced English Grammar

FEN2B02 Advanced English Grammar

Module I

Parts of Speech-Sentence Structure (NP, VP)-Verbs (regular and irregular)-Auxiliary Verbs- primary, modal and semi-modal-Pronouns -personal, reflexive, emphatic, demonstrative, indefinite.

Module II

Time and Tense-Articles-Reporting-Tag Questions-Passive/active Voice

Module III

Comparison of adjectives-Concord-Sentence types based on clauses.

Module IV

Conjunctions (coordinating and subordinating)-Prepositions-Conditional sentences and wishes- **common errors.**

Core Reading

Betty Azar. Understanding and Using English Grammar. Longman

David Green. Contemporary English Grammar, structures and composition. Trinity

Suggested Reading

UR. Penny, Grammar Practice Activities: A Practical Guide for Teachers. Cambridge: CUP, 2008

Hewings, Martin.Advanced Grammar In Use. New Delhi: CUP,2008

Leech, Geoffrey, and Jan Svartvick. A Communicative Grammar of English.

London: Longman 1998

Language and Technology

FEN3B03 Language and Technology

Module-I. Digital Learning

Software and Types-FOSS-OER Commons-Project Gutenberg-Swayam-E(PG) Pathshala- Inlibnet-MOOC-Khan academy-Presentation software and educational potential- characteristics of an Ideal PPT presentation.



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Module-II. Internet and linguistic impacts

World Wide Web-its impact on English-NetSpeak-features of NetSpeak-The language of Emails-hypertexts and interactivity-virtual libraries-online dictionaries-e-zines-webinars-the linguistic future of the internet.

Module III. Internet for LSRW

Learning and teaching in the cyber era-sites/programmes for English Language Learners (www.bbc.co.uk/learningenglish / www.learningenglish.voanews.com / www.esl-lab.com/ www.eslpdf.com/ www.englishbanana.com)-student publishing-wikis and blogs-podcasts- vodcasts.

Module IV. Smartphones as educative tools

Potential uses of smartphones in English classrooms-Useful mobile applications for English language learning and teaching (LEB English/VOA English/great poetry/Hello TalkEnglish/English conversation/wordweb)-Mobile Learning Management Systems (MLMS)-Edmodo and Schoology- M-testing.

Core Reading

Crystal David (2004) The Language and the Internet. CUP

Warschauer, Mark & Shetzer, Heidi (2003) Internet for English Teaching:Vriginia

Suggested Reading/e-resources

www.bbc.co.uk/learningenglish , www.learningenglish.voanews.com / www.esl-lab.com/ www.eslpdf.com/ www.englishbanana.com , E-book available at www.englishskillsone.com

Applied Phonetics

FEN3B04 Applied Phonetics

Module I: Introduction to speech mechanism

Speech Mechanism-Organs of Speech

Module II: English Sound System

Phonemes – Consonants and Vowels-Classification of sounds – Cardinal Vowels, Diphthongs and Triphthongs-allophones and allophonic Variations.

(transcription practice at word/sentence level is to be done in the classroom)



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Module III

Supra-segmentals-Syllable-Stress and Rhythm – Intonation – Juncture-Elision and Assimilation-Homonyms and Homophones.

(learners have to be sensitized to supra-segmental features with the help of language labs/smart phones/mobile apps, preferably using native speaker 's audio/video clips)

Module IV: Major varieties of English

Differences between British and American varieties (Vowels - Consonants - Stress related dissimilarities)

Vocabulary variations-GIE and its characteristics.

Core Reading

Balasubramanian, T. A Textbook of English Phonetics for Indian Students. Syamala V. A Textbook of English Phonetics and Structure for Indian Students.

Suggested Reading

Damodar, G., Prema Kumari, D., Ratna Shiela Mani K., SaiLakshmy, B., (Gen.Ed. Rajagopal Book for Practice in the Spoken Mode, Foundation Books, 2006.

P. Kiranmai Dutt, Geetha Rajeevan, Basic Communication Skills, CUP India 2007 (Part 1 only)

V. Sasikumar, P. Kiranmai Dutt, Geetha Rajeevan, A Course In Listening & Speaking I, CUP India 2005.

O' Connor, J.D. Better English Pronunciation. Cambridge: Cambridge University Press, 2008

Fundamentals Of Linguistics

FEN4B05 Fundamentals Of Linguistics

Semester: 4

Credit: 4

Contact Hrs/week: 5

Course Objectives

- To introduce the basic concepts of Linguistics and to familiarize the students with the fundamentals of modern linguistics
- To familiarize the students with the origin and development of language with special reference to English



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KEY INDICATOR	1.3	Curriculum Enrichment
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- To provide a brief historical survey of the development of Modern Linguistics
- To develop in them the ability to do intensive reading for identifying specific Information

Learning Outcomes

- The learners understand the relationship between linguistics and related disciplines.
- They will be able to use linguistics as a tool in understanding and processing written or spoken text.
- They realize the complexities underlying the structure and function of human languages
- They acquire better communication and analytical abilities in English.

Module-I: Understanding language

Language-definition(s)-origin-characteristics-language and culture-limitations of animal communication-ethnologue- language death.

Module-II: Linguistics and key concepts

Linguistics-definition(s)-nature and scope-phonetics and phonology-langue and parole-synchrony versus diachrony-paradigmatic and syntegmatic relationships-signifier and signified-competence/i- language and performance/e-language-binarity-ambiguity.

Module III: Grammar of words and sentences

Semantics-meanings and connotations-word formation processes-traditional and modern approaches to grammar-form and function-grammaticality and acceptability-TG Grammar-IC Analysis –corpus grammar and pedagogy- spoken grammar and written grammar.

Module IV: Language and recent trends

Socio-linguistics-code switching and code mixing-language variations-New Englishes-the linguistic characteristics of New Englishes-corpus linguistics-pragmatics-lexicology-Americanisation.

Core Reading

Bauer Laurie (2007) The Linguistics Student’s Handbook. EUP Yule, George (2010) .The Study of Language.CUP

Suggested Reading

Thornbury Scott (2002) How to teach grammar. Longman
 Anne O’keeffe & Michael McCarthy (2007) From Corpus to classroom: Language use and language teaching. CUP
 Varga, Laszlo (2010). Introduction to English Linguistics. ELU
 Geoffrey, Leech; Smith & Mair (2009) Changes in Contemporary English. CUP



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Business English

FEN4B06 – Business English

Module I: Business & communication

Importance of communication in business-7Cs of effective communication-communication types (downward, upward, horizontal, diagonal) kinds of presentations in business (monologue, guided, sales) effective presentation strategies & structure-body language-negotiation skills.

Module II: Business correspondence

Types of correspondence-its importance in business-elements, features& formats of business letters- types of letters (inquiry, quotation, complaint, adjustment, collection, cover letter, interview letter, appointment letter)

(Written practice and assignments to ensure the letter drafting skills of learners have to be given)

Module III: Official Correspondence

Drafting Emails (features & dos and don'ts)- office memorandum-office orders- office circulars minutes of meetings-writing reports.

(Classroom works and assignments to ensure the writing skills of learners have to be given)

Module IV: Interviews & Meetings

Before, during and after interviews-types of interview questions-interviewer's questioning styles frequent question types in interviews.

Chairing a meeting- polite ways of stating and asking for opinions- asking for/giving clarifications- ending the meeting.

Core Reading

RC, Bhatia. Business Communication. New Delhi: ANE Books, 2008 Mallika Nawal. Business Communication

Suggested Reading

Blundel, C.A & Middle Miss. NMG. Career: English for Business and Commercial World. New York: OUP, 2009

KK, Lakshmi & KK, Ramachandran. Business Communication. New Delhi: Mac Millian, 2007 Sweeny, Simon. Communicating in Business. New Delhi: CUP, 2004

E-book available at www.englishskillsone.com



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Translation Studies

FEN5B07 Translation Studies

Module I: Basic concepts

Basic concepts and a brief history of translation studies-translation types: (partial, full,literal,free,word-for-word,sense-for-sense,interlingual, interlingual and intersemiotic)- equivalence-untranslatability-technology and translation.

Module II: Translating Poetry

Translation of poetry-basic issues-translation as recreation/transcreation -translation competence- Text for translation: The Tiger by William Blake

Practices in translating short poetry texts from English to mother tongue and vice versa-peer analysis and discussions.

Module III: Translating prose

Translation of Prose-issues of styles and registers-transliteration-translation as intercultural communication.

Text for Practice: On Doors by Christopher Morley

Practices in translating short prose texts from English to mother tongue and vice versa -peer analysis and discussions.

Module IV: Translating drama

Translating Drama—Issue of dramatic diction and performability-translator as cultural mediator-translating text in context- Translating news reports/articles-oral translation/real-time human translation-major issues.

Text for Practice: Ghosts (A few dialogues from Act-III) by Henrik Ibsen

Practices in translating short dramatic scenes/articles/real time speech from English to mother tongue and vice versa-peer analysis and discussions.

Core Reading

The Routledge companion to Translation Studies edited by Jeremy Munday Susan Bassnett. Translation Studies

Suggested Reading

Introducing Translation Studies: Theories and applications by Jeremy Munday

J. C. Catford. A Linguistic Theory of Translation Nida Eugene. Theory and Practice of Translation

Roman Jakobson. On Linguistic Aspect of Translation



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Sujit Mukherjee. Translation as Discovery. Hyderabad: Orient Longman, 2006.

Print Media

FEN5B08 Print Media

Module I: History of Indian Journalism

The Age of Print-The beginning of Indian Journalism- Firm roots with British Raj and spread of English journalism- The Press and the Freedom Movement- recent developments.

Module II: Introduction to Mass media.

Importance of Mass Media-Functions-Variety types of mass media and their characteristics- Print media: newspaper, magazine, books. Electronic media: TV, Radio, Films. The New Media- the Internet-Media Convergence-Media ethics-‘media world’ vs native culture.

Module III: Writing for the media

Role of Journalism-Journalistic Writing vs Creative Writing-Print media contents: News writing and news structure-; leads and types of leads –Report writing; News Agencies- Feature writing – Structure and types Editorial–Review writing (Book/ Film)- The People's Voice- Letters to the Editor.

(sessions to analyse language and contents of sample news/reports/leads have to be **incorporated**)

Module IV: Journalistic English

Writing captions & headlines (language, tense, voice and style)-rules of editing- Proofreading and symbols, standards in editing-designing, artwork, pagination.

Journalistic Glossary to be introduced: Banner, Headline, bleed, blooper, barker, byline, credit line, dateline, deadline, gravure, gutter, jump line, nameplate, masthead, offset, op-ed, tombstone, tabloid, stringer, dummy, freelance, news agency, beat, breaking news, scoop, new journalism, precision journalism, style Book, citizen journalist, investigative journalism, sting operation, yellow journalism.

Core Reading

Seema Hasan. Mass Communication: Principles and Concepts; CBS Publishers. Essential English for Journalists, editors and writers- Harold Evans

Suggested Reading

Kundra, G. C. History of Journalism in India. (2004).



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Moitra, Mohit. A History of Indian Journalism, Hardcover. (1969).

Mencher, Melvin. Basic News Writing. Dubaquet: William C. Brown Co.,1983.

Premanand, M.E. Textbook on Media Studies (2012)

E-book available at www.englishskillsone.com

Theatre for Communication

FEN5B09 Theatre for Communication

Module I: History and Evolution of Drama

Drama as a performing art - Drama as a tool for social criticism – Theatre – Introduction to theatres such as Absurd, Epic, Street, Cruelty, Anger, **Feminist**, Ritualistic, and Poor. Genres: Tragedy, Comedy, Tragi-Comedy, Farce and Melodrama, Masque, One-Act Play.

Module II

Aristotle’s observations of drama –elements of tragedy-Contributions of important ancient Greek playwrights: Aeschylus, Sophocles, and Euripides- Important contributors in twentieth century theatre: Constantine Stanislavski- Psycho- physical system, Augusto Boal- The Theatre of the Oppressed.

Module III: List of Plays for Practicals

Script writing-adaptation and editing of prescribed plays/scenes by teams of students- Rehearsals for final presentation.

Tagore: Chandalika- (Act II)

G B Shaw: Pygmalion (Act-III)

Shakespeare: Merchant of Venice (The Trial scene) **Henrik Ibsen: A Doll’s House (Act -III)**

Fritz Karinthy: Refund (Adapted by Percival Wilde)

Module IV: Practicals

Final production of the play/act/scene by each group.

The groups present the plays/acts/scene adapted and edited by them in front of the whole class. This should be followed by an interactive feedback session with the teacher, the faculty, peer group members from the same class and others in the audience, if any.

Weight: After the performance, weight for the Internals (Practicals) should be given according to the following priority (to each group, and to each member of the group):

- i. Effective communication of the story through the play.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- ii. Clarity in articulation and fluency.
- iii. Confidence and body language.
- iv. Verbal and non-verbal performance.
- v. Costumes, light, sound, and settings need not be given any weightage, as the emphasis is more on theatre as communication.

(Theatre workshops involving local theatre groups or resource persons can be organized for adequate exposure to theatre arts.)

Reading List Core Text

Sreerexha, N. Reading Drama. New Delhi: Oxford University Press, 2011.

Recommended Texts

N. Fraser, Theatre History Explained, Crowood Press, 2004

M. Wallis & S. Shepherd, Studying plays, London & New York, Hodder Education, 2002. Williams

Raymond. Drama from Ibsen To Brecht Pengu books, 1968

O. Brockett. A History of the Theatre. Allen and Bacon, 1991.

Contemporary Literary Theory

FEN5B10 Contemporary Literary Theory

Semester: 5

Credit: 4

Contact Hours/Week: 6

Course Objectives

- To initiate students into 20th Century Literary Theories and Critical approaches
- To provide them exposure to diverse theoretical practices and its applications
- To make the students familiarize with contemporary theories and theoreticians
- To provide a larger framework of theory to enhance the taste of research

Module- I

New Criticism (Irony, Paradox, Ambiguity, Affective Fallacy, Intentional Fallacy, Tension)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Russian Formalism : (De-familiarization, Metaphor, Metonymy)

Structuralism (Signified, Signifier, Binary Opposition, Langue and Parole)

Module-II

Post-structuralism (Deconstruction, Aporia, Logocentrism, Binary Opposition)

Feminism (Patriarchy, Woman as Reader, Woman as Writer)

Module-III

Marxism (Class Consciousness, Hegemony, Ideology)

New Historicism (History of Textuality, Textuality of History)

Module-IV

Psychoanalysis (Id, Ego, Super ego, Condensation, Displacement, Latent Content and Manifested Content, Jouissance)

Eco-Criticism (Green studies, deep ecology, ecopoetics, biopolitics)

Queer Theory (LGBTIQ)

References

Beginning Theory---Peter Barry

Glossary of Literary Terms—MH Abrams

Literary Theory: A Practical Introduction---Michael Ryan

English Language Teaching

FEN6B11 English Language Teaching

Module-I: Introduction to ELT

Basic

glossary-(L1/L2,

ESL/EFL, TESOL, CALL, ICT, CLT, EAP, ESP, ELL, PPP, TBL, IELTS/TOEFL, PT, AT, CE)-Receptive and

Productive Skills-Acquisition and Learning-English as an international Language-reasons for its spread-

World Englishes-the history of ELE in India-GIE-the future of English(es).

Module-II: ELT Principles and Practices



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Learning theories-behaviourism, cognitivism, constructivism- Defining approach -Structural, Lexical, and Communicative approaches -defining method- Grammar Translation, Direct, CLT, Bilingual methods-Task Based Learning and Teaching- Post-method Concept.

(Practical ways of teaching a single language component using different approaches/methods have to be demonstrated in the classroom)

Module III: From Theory to Practice

Lesson planning-teaching grammar, vocabulary and pronunciation-Integrating skills-Peer teaching/Micro- teaching.

(Practical peer/microteaching by students is to be done in the class and it can be an alternative to tests meant for internal assessment)

Module IV: Language Testing and Evaluation

Testing and teaching-Types of tests-Characteristics of a good test- Test Items

Core Reading

Harmer, Jeremy (2001) The Practice of English language Teaching. Orient Longman

Nagaraj, Geetha (2010) English Language Teaching: Approaches Methods and Techniques. Orient Black swan

Suggested Reading

McKay, Sandra (2002) Teaching English as an International Language, OUP

Larsen, Freeman and Anderson (2011) Techniques and Principles in Language Teaching.OUP Peter, Jason. (2006) English to the World: Teaching Methodology Made Easy. August Publishing Nunan, D

(2003) Practical of English language Teaching. New York. McGraw Hill.

Kumaravadivelu (2006) Understanding Language Teaching: from Method to Postmethod. Lawrence Associates

Electronic Media

FEN6B12 Electronic Media

Module I: Electronic Media



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Definition, types, characteristics of broadcast writing, immediacy, conversational style, clarity.-brief History of Radio, TV and New Media – DD-AIR

Module II: Radio

Radio as mass medium - Radio programme formats-Bulletins, documentaries, drama, commercials, phone in programmes- New trends - FM - Bands – radio Jockeys-**Radio scripting techniques- Guidelines for good radio script**-Radio recording techniques-community radio.

Module III: Television

Television as a mass medium –television broadcasting- new trends: Cable, DTH, IPTV, HDTV- Internet TV- Writing for television-TV programme formats-news, talks, interviews, -soap operas, cookery shows, reality shows-Basics of TV programme Production.

(practices/presentations in different programme formats have to be assigned to students)

Module IV: New Media

Online Journalism-Media convergence –information superhighway –global village-advantages and disadvantages of new media- writing for web-E-Journal-Blogging- **Introduction to Advertising and public relations.**

Field Work: Students have to visit a TV/Radio broadcasting station to gain practical knowledge. (Study Tour)

Core Reading

Seema Hasan. Mass Communication: Principles and Concepts; CBS Publishers. A Guide to Journalism and Mass Communication- Majime Books

Suggested Reading

White, Ted. Broadcast News Writing, Reporting and Production

Feldman Tony. An Introduction to Digital Media (Blueprint series)Paperback., 1996 Vilanilam. J. V.

Mass Communication in India. Sage publications : New Delhi, 2005 Griffith David. A Crash Course in Screenwriting. Glasgow: Scotish Screen

Lewis Richard L. Digital Media: An Introduction

M. L. Stein, Susan F. Paterno&R. Christopher Burnett. News Writer’s Handbook. Blackwell, 2006.

E-book available at www.englishskillsone.com



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Creative Writing

FEN6B13 Creative Writing

Module I: Introduction

Introduction to creative writing-writing as an art-voice-creating a world-defamiliarisation-imagination-words as images-preparing for publication-plagiarism and intellectual property rights.

Module II: Writing Poetry

Writing Poetry: analyzing elements of poetry: figures of speech-diction-rhythm and verse forms-major poetic forms with examples.(poetry writing sessions and critical peer analyses of the poems have to be done in the class)

Text for analysis: Ulysses by Tennyson (<https://www.poetryfoundation.org/poems/45392/ulysses>)

Module III: Writing Fiction

Writing Fiction: analyzing elements of fiction – different genres and types – narrations and techniques/ points of view- introducing a character. (Short story writing sessions and critical peer analyses of the stories have to be done in the class)

Text for analysis: The Looking Glass by Anton Chekhov (<https://americanliterature.com/100-great-short-stories>)

Module IV: Writing Drama

Writing Drama: analyzing components of drama-mechanics of writing dialogues- basic divisions- screenplays-components of travelogues and memoirs (dramatic scene/screenplay/travelogue writing sessions and critical analyses have to be done in the class)

Text for analysis: ILE, a play in one-act by Eugene O'Neill ,(<http://www.one-act-plays.com/dramas/ile.html>)

*The student's writings during the course have to be compiled and brought out as a magazine.

* Popular pieces of literature have to be taken up for analysis in each module

Core Reading

An Introduction to the Study of Literature – Hudson The Routledge Creative writing Coursebook-Paul Mills The Oxford essential Guide to writing-Thomas S Kane Suggested Reading

The Cambridge introduction to creative writing-David Morley A glossary of literary terms MH Abrams Creative Writing: A Beginner's Manuel- Dev, Marwah & Pal (pearson)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Film Studies

FEN6B14 Film Studies

Module I: Introduction

Introduction to the basic concepts of Film Theory and major theoretical positions on cinema- Basic concept of Representation- Idea of ‘_Text’ and ‘_Authorship’- Introduction to the film theories of Sergei Eisenstein, Andre Brazin, auteur theory, Christian Metz and Laura Melvy- Introduction to Film Semiotics

Module II: Major movements and film genres

The silent era, classic, Hollywood cinema, Realism and Neo-Realism in Cinema, French New wave, Indian Cinema, Soviet Montage. The Major Genres-Narrative, avant-garde, documentary-Other genres- thriller, melodrama, musical, horror-western, fantasy animation, film noir, expressionist, historical, mythological, road movies

Module III: Basic terminology of film making

Mise en scene, long takes, deep focus, shots (close up, medium shot, long shot)-Editing- Chronological editing, cross cutting, montage, continuity editing, continuity cuts, m jump cuts, match cuts, 30 degree rule, 180 degree rule, The production, distribution and reception of films; censorship

Module IV: Film texts and case studies of Classic Cinema

- Satyajit Ray: —What is Wrong with Indian Films| (From Our Films Their Films)
- V C Harris: —Engendering Popular Cinema in Malayalam| (From Women in Malayalam Cinema: Naturalizing Gender Hierarchies. Ed. Meena T Pillai)

Case Studies of Classic Cinema

- Modern Times Silent Cinema
- Sound of Music- Musical
- Psycho- Thriller
- Yavanika-Malayalam film
- Bicycle Thieves-Italian Neo-Realism

Suggested Films

Life is Beautiful (Roberto Benigni) Shawshank Redemption (Frank Darabont) Seven Samurai (Akira Kurosawa) Anantharam (Adoor Gopalakrishnan)

The student will be capable of analyzing and making a critical evaluation of these Movies.

Suggested Reading

- Introduction to Major Film Theories- J D Andrew
- Film Theory: An Introduction – R Lapstey and M Westlake



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Film Theory and Criticism – Mast & Cohen
4. Eisenstein Reader- ed. Richard Tylor
5. What is Cinema, vol II – Andre Bazin
6. New Vocabularies in Film Semiotics- R Stendal
7. Film Language: A Semiotics of Cinema (C Metz)
8. Peter Wollon’s analysis of North by North-West (Readings and Writings)
9. The Point-of-View Shots (Edward Banigen)
10. Teach Yourself Film Studies- Warren Buckland
11. A History of Film- Virginia Wright Wexman
12. Key Concepts in Cinema Studies- Susan Heyward

Language For Advertising: Theory & Practice

FEN6B15 Language For Advertising: Theory & Practice

Module I

Advertising as a Process: four components: the advertiser, the advertisement, the ad agency and the mass media. Ad. Agency: structure, function and characteristics of a good ad agency--Media selection criteria--Client satisfaction.

Module II

Advertisement types: Product, Service, Industrial, Institutional, Public Service

Media wise category: Print media ads, Electronic media ads (Radio, TV and Film) and New Media ads. Non-Mass Media ads: Graffiti, Billboards, fliers, novelties etc.

Module III

Copy writing, copy creativity, copy structure, text: Headline, slogan, body copy Copy style, Credibility, readability. Qualities of a good copy writer. Visualization of Advertisements: **typography, Illustration, logo, trademarks, themes, graphics, appeals, animation, special effects and basic principles of designing.**

Core Text

Vilanilam and Varghese. Advertising Basics! A Resource Guide for Beginners. Response books – a Division of Sage Publications, NewDelhi, 2004.

Suggested Reading



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Aitchinson J. Cutting Edge Copy Writing. Prentice Hall, Singapore, 2001

Twitshell, J B. Twenty Ads that shook the World. Crown Publication (Random), 2000. Vilanilam J. V: More Effective Communication: A Manual for Professionals. New Delhi, Response Books/Sage, 2000.

Nylen, D W, Advertising: Planning, Implemenation and Control, 4th Edition, Cincinnati, OH: South Western Publishing Co. 1993.

Literatures In English: Course I : From Chaucer To The Present

FEN1(2)CO1 Literatures In English: Course I : From Chaucer To The Present

Module I

Early English Poetry, **Geoffrey Chaucer. (Prescribed Text, First 20 lines of Prologue to Canterbury Tales)**

Elizabethan Age and its Features.

(Renaissance, Reformation, the new learning, discovery, spirit of adventure) Prescribed Text: William Shakespeare, The Opening Scene of King Lear.

Francis Bacon, Of Studies.

Jacobean Era and its Political and Literary Characteristics.

(Grim humour, moral corruption, violence, counter-reformation)

Prescribed Texts: **John Donne, Sun Rising. John Webster The Duchess of Malfi - Act IV**

Restoration, its literary features.

Prescribed Text: John Dryden, Alexander's Feast.

Module II: Augustan Literature and its features

(Restoration, new morality, coffee houses, neo-classism, age of reason, satire, Poetic Diction) Prescribed texts: Sir Richard Steele, Spectator Club.

Jonathan Swift Gulliver's Travel's (Part One)

Romanticism, its major features and authors.

(liberation of the self, return to nature, subjectivity, rustic life, imagination, language of common man)

Prescribed texts: **William Wordsworth, Rainbow**

Byron: She Walks in Beauty

P. B. Shelley, Ozymandias.

Module-III



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Victorian Age, Social and Literary Characteristics; Major Authors. (Tennyson, Arnold, Browning, Charles Dickens, George Eliot, Emily Bronte) Prescribed Texts

Robert Browning, My Last Duchess.

Charles Lamb, Dream Children.

Mathew Arnold: Dover Beach

Modernism, its literary features and prominent figures

(Imagism, World War, symbolism, the Lost Generation, allusion, New Criticism)

T. S. Eliot, Journey of Magi.

W B Yeats: Circus Animal's Desertion

J. M Synge, Riders to the Sea.

Module-IV

Post 1940 Literature, Second World War and its impact on Literature. (revival of Romanticism, Surrealism, Movement poetry, Absurd literature,) Prescribed texts,

Dylan Thomas, Do not go Gentle into that Good Night

Philip Larkin, Ambulances. Ted Hughes Thought Fox Harold Pinter, Room.

Core Books

Core texts mentioned in the modules.

Books for Reference

1. Crompton & Ricket. History of English Literature
2. Long, William J. English Literature: Its History and its Significance, ed. Kalyani Publishers, New Delhi
3. M. H. Abrams. A Glossary of Literary Terms, Harcourt Publishers, New Delhi, 2001.
4. John Peck and Martin Coyle. A Brief History of English Literature, Palgrave, 2008

Literatures In English: Course II: American & Post Colonial

FEN4(3) CO1 Literatures In English: Course II: American & Post Colonial

MODULE I

A) Introduction to Postcolonialism –

(Colonialism, Imperialism, Post-colonialism, Diaspora, History, Nationalism)

B) Leading 20th century Post Colonial thinkers

1) Franz Fanon (National Consciousness, Identity)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- 2) Edward Said (Concept of Orientalism)
- 3) HomiBabha (Hybridity, Ambivalence, Mimicry, Diaspora)
- 4) Gayatri Chakravarty Spivak (Subalternity, Representation)

MODULE II

Poems:

Gabriel Okara: Mystic Drum

Margaret Atwood: This is a Photograph of me Kamala Das: Nani

David Diop: Africa

Nissim Ezekiel: Goodbye Party to Miss Pushpa TS

(blogginginparis.com/2004/08/22/afrique-africa-by-david-diop-1927-1960/ -)

Drama: Vijay Tendulkar- Silence! The Court is in Session – Act I

Story: O V Vijayan- After Hanging

MODULE III

A brief historical survey of the movements and concerns of American Literature (Transcendentalism, American Romanticism, Civil War, Beat Generation, Confessionalism, Womanism)

MODULE IV

Poetry

“Success is counted Sweetest// Emily Dickinson

—Anecdote of the Jar//Wallace Stevens

—My Papa’s Waltz//Theodore Roethke.

—Anyone Lived in a Pretty How town//E. E. Cummings

—Tulips// Sylvia Plath

—Dream Deferred// Langston Hughes

Fiction and Drama

—Gift of Magil// O. Henry.

—Old Man and the Seal// Earnest Hemingway.

—The Hairy Apell// Eugene O'Neil

Further Reading

- 1) Colonialism/Post Colonialism – Ania Loomba
- 2) Colonial and Post Colonial Literature II Edition – Elleke Boehmer
- 3) Literary theory (The basics) – Hans Bertens
- 4) Beginning Theory by Peter Barry
- 5) Empire Writes Back: Bill Ashcroft, Gareth Griffiths and Helen Tiffin.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Reference

1. Bonglke, Rangrao (Ed) Contemporary American Literature: Poetry, Fiction, Drama and Criticism. New Delhi: Atlantic Publishers, 2002.
2. Iyengar ,Sreenivasa K.R. Indian Writing in English, Delhi: Sterling, 1984
- 3 Naik, M.K. A History of Indian English Delhi: Sahitya Literature Academi, 1982
4. Naik,M. K.(Ed). Perspectives on Indian Poetry in English. New Delhi: Abhinav Publications, 1984.
5. Mathiessew, F.O. American Literature upto Nineteenth Century
6. Collins-An Introduction to American Literature.

Semester: 2

Credit: 4

Contact Hours/Week: 6

Course Objectives

- To enable the student to analyse and explain major theories that both influenced and came out of Cultural Studies and its approach to _high and popular culture.
- To equip the student to apply one or more concepts of cultural studies to unique research problems.
- To demonstrate the practicality of cultural studies theory to new situations and practices relevant to the everyday experience of students.

Learning Outcomes

By the end of the semester the student will be able:

- To discover the contours of Cultural Studies as a field of inquiry, situating their learning within explorations of the disciplinary and historical context of the field.
- To use interdisciplinary critical perspectives to examine the diverse and sometimes contested meanings of cultural objects and processes, establishing a basic knowledge of the theoretical paradigms of Cultural Studies.
- To connect cultural knowledge to everyday life and practices, gaining a preliminary understanding of the relationship of methodology (paradigms for study) to inquiry in Cultural Studies.

MODULE 1

1. **Cultural Studies: An Introduction**



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Culture,
2. Popular Culture,
3. Production and Consumption of Culture
4. Power/Culture
5. Origin of Cultural Studies

MODULE 2

Methods of Cultural Studies:

1. Methods of Cultural Studies
2. Language and Discourse
3. Identity
4. Audience and Reception Studies

MODULE 3

Major Theories

Introduce briefly so as to understand the concept:

1. Structuralism
2. Post Structuralism
3. Marxism

MODULE 4

Major Theories

4. Feminism
5. Queer Theory
6. Post-Colonial Theory

Glossary of Literary Terms—MH Abrams Beginning Theory—Peter Barry

An Introduction to Cultural Studies—Prmod K Nayar

CORE TEXT: Pramod K Nayar. An Introduction to Cultural Studies. Viva Books, New Delhi



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Cultural Studies: Course II Cultural Spaces

FEN4(3) CO2 Cultural Studies: Course II Cultural Spaces

MODULE ONE

Locations of Culture

Introduce briefly so as to understand the concept.

1. Modernity
2. Postmodernity
3. Globalization
4. The Nation State
5. New Social Movements
6. Fundamentalism

MODULE TWO

The Culture Industry: Key areas to be Introduced

1. Product of Consumption
2. The Spaces of Consumption I: The Mall
3. The Spaces of Consumption II: Online Shopping

MODULE THREE: Select Terms and Issues

Gender, Site, Race, Class, Ideology, Cyberspace,

MODULE FOUR: Select Terms and Issues

Hegemony, Hybridity, Consumerism, Counterculture, Margin(ality), Paradigm

(Reference for Module Three: A Glossary of Cultural Theory—Peter Brooker available as e book in the site: <https://lisamonalisa.files.wordpress.com/2011/01/brooker-a-glossary-of-cultural-theory.pdf>)

CORE TEXT: Pramod K Nayar. An Introduction to Cultural Studies. Viva Books, New Delhi

Further Reading

Chris Barker, Making Sense of Cultural Studies, Sage, 2002

Simon During, Cultural Studies: A Critical Introduction. Routledge, 2005



CRITERION	I	Curricular Aspects
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Language for Advertising: Theory & Practice

FEN5D02 Language for Advertising: Theory & Practice

Module I

Advertising as a Process: four components: the advertiser, the advertisement, the ad agency and the mass media. Ad. Agency: structure, function and characteristics of a good ad agency--Media selection criteria--Client satisfaction.

Module II

Advertisement types: Product, Service, Industrial, Institutional, Public Service

Media wise category: Print media ads, Electronic media ads (Radio, TV and Film) and New Media ads. Non-Mass Media ads: Graffiti, Billboards, fliers, novelties etc.

Module III

Copy writing, copy creativity, copy structure, text: Headline, slogan, body copy Copy style, Credibility, readability. Qualities of a good copy writer. Visualization of Advertisements: typography, Illustration, logo, trademarks, themes, graphics, appeals, animation, special effects and basic principles of designing.

Core Text

Vilanilam and Varghese. Advertising Basics! A Resource Guide for Beginners. Response books – a Division of Sage Publications, NewDelhi, 2004.

General Reading

Aitchinson J. Cutting Edge Copy Writing. Prentice Hall, Singapre, 2001

Twitehell, J B. Twenty Ads that shook the World. Crown Publication (Random), 2000. Vilanilam J. V: More Effective Communication: A Manual for Professionals. New Delhi, Response Books/Sage, 2000.

Nylen, D W, Advertising: Planning, Implemenation and Control, 4th Edition, Cincinnati, OH: South Western Publishing Co. 1993.



CRITERION	I	Curricular Aspects
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Management Principles in Sanskrit

CC21USKT5D01 Management Principles in Sanskrit

CC21U SKT 1 A 07 (01) Samskrtasahityasamiksha-I
(Kavya literature and Appliedgrammar)

CC21U SKT 2 A 08 (01) Samskrtasahityasamiksha-II
(Prose and Applied Grammar)

CC21U SKT 3 A 09 (01) Samskrtasahityasamiksha-III
(Drama and Alankara)

CC21U SKT 4 A 10 (01) Samskrtasahityasamiksha-IV
(History of Sanskrit Literature, Kerala Culture
and Translation)

CC21U SKT 1 A 07 (02) Samskrtasahityadhyayanam-I
(Prose, Subhashitas and Basic Grammar)

CC21U SKT 2 A 09 (02) Samskrtasahityadhyayanam-II
(Ancient State Craft and Translation)

CC21U SKT 1 A 07 (03) Samskrtasamanyaparichayah-I
(Poetry and Grammar)

CC21U SKT 2 A 08 (03) Samskrtasamanyaparichayah-II
(Drama and AssessmentTranslation)

CC21U SKT 5 D 01 Management Principles in Sanskrit 3



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Samskratasahityasamiksha-I

CC21USKT1A 07(01) Samskratasahityasamiksha-I

(Kavya literature and Applied Grammar)

Module I-

(A) Origin and Development of Kavya Literature

(B) Characteristics of Mahakavyas

(C) Panchamahakavyas

(D) Khanda Kavyas

(E) Historical Kavyas

1. Rajatharangini

2. Madhuravijayam

3. Raghunathabhyudayam

4. Mushikavamsam

5. Angalasangraham

6. Keralodayam

Essential Reading:

A Short History of Sanskrit Literature

Module II

Kalidasa Literature

(A) Poetic style and excellence of Kalidasa

(B) Works of Kalidasa

Essential Reading :

Raghuvamsa of Kalidasa

Canto 1- 1-30 Verses

Module III

Subhashitas Characteristics of Subhashitas and Major authors

Essential Reading:

Bhartrhari's Nitisataka - Selected 20 Verses



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Module IV

Applied Grammar

Sanskrtadipika Part-1

Samskrta Sahityadhyayanam-I

CC21USKT1A 07(02) Samskrta Sahityadhyayanam-I

Module I

A brief introduction to the popular tales and fable in Sanskrit literature with special referenceto Panchatantra, Hitopadesha, Kathasaritsagara etc

Essential reading -

selected five stories from Panchatantra.

Module II

a.Kshapanaka katha

b. Brahmani Nakulakatha

c. Lobhavishtachakradhara katha

d. Chandrabhupati katha

e. Brahmanakarkatakatha

Module III

Inculcate moral value education among students.

Essential Reading: Selected 20verses from Neetisataka

Module IV

Grammar

Sanskrtadipika -Part 1



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Samskrta Sahitya Samiksha-II

CC21USKT2 A 08(01) Samskrta Sahitya Samiksha-II

(Prose and Applied Grammar)

Module I

History of Prose Literature

Origin, development and classification of prose literature, major prose works in Sanskrit Literature

Essential Reading:-

A Short History of Sanskrit Literature by T.K Ramachandra Iyer.

Module II

Sanskrit Essay

Essential Reading:

Samskrta Adhyayanasya Prayojanam.

Essential Reading: Subbarammeeyam

Module III

Textual study of Pancatantra. Selected five stories Apariksitakaraka

1. Kshapanakakatha. 2. Lobhavishtachakradharakatha.

3. Brahmaninakulakatha. 4. Somasharmapitrukatha. 5. Chandrabhupathikatha.

Essential Reading:-

Pancatantra of Vishnusharman, Published by Chowkhamba Krishnadas

Academy,

Varanasi

Module IV

Grammar -

Samskrta Dipika- Part 2



CRITERION	I	Curricular Aspects
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Samskratasahityadhyayanam-II

CC21USKT2A09(02) Samskratasahityadhyayanam-II

Module I

Commerce in Ancient India

Essential reading

Following chapters from Prachinavaniyam

Ed. By Dr. M. Sivakumaraswamy,

Bharavi Prakashana, Bangalore, 2006

Chapter-1 Arthasamuddesha

Chapter-2 Koshasamuddesha

Chapter-3 Varthasamuddesha

Chapter-13 Lekhyasamuddesha

Module II

Management principles of Bhagavad gita.

Essential reading The portion of Management principles and teachings of gita from the article on Management and Indian Heritage by V.K.S. Menon from

Indian Traditions of Management , Ed. Dr. N. V.P.Unithiri, Calicut University

Sanskrit Series.

Module III

Translation

Essential Reading:-

Samskrta Deepika Part 2



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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SamskrtaSahityasamiksha-III

CC21USKT 3 A 09(01) SamskrtaSahityasamiksha-III (Drama and Alankara)

Module I

Origin, development characteristics and types of Sanskrit drama.

Major authors and Major Texts in Sanskrit Drama (Kalidasa, Bhavabhuti, Mricchakatika, Mudrarakshasa and Ascaryacudamani)

Essential Reading:

A Short History of Sanskrit Literature

Module II

Plays of Bhasa – Its style and characteristics, appreciation of the dramas of Bhasa,

Essential Reading:

Urubhanga of Bhasa

Module III

Alankara- The main features of Alankara in Sanskrit Literature.

Essential Reading:

Kuvalayananda of Appayya Dikshita (Upama, Utpreksha, Dipaka, Slesha and Arthantharanyasa)

Module IV

A short History of Systems of Indian Philosophy

(Nyaya And Vaiseshika, Sankhya, Yoga And Mimamsa)

Essential Reading:

A Short History of Sanskrit Literature . Page193-203.



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History Of Sanskrit Literature, Kerala Culture and Translation

CC21USKT 4 A 10 (01) History Of Sanskrit Literature, Kerala Culture and Translation

Module I

EPICS IN SANSKRIT

Module II

A short History of Systems of Indian Philosophy
(Vedanta, Advaita, Visishtadvata, Dvaita, Jainism And Buddhism)

Essential Reading:

A Short History of Sanskrit Literature (Page -203-211)

Module III

CHAMPUKAVYAS

- 1.Nalachampu
- 2.Yasasthilakachampu
3. Ramayana Champu
4. Bharatha Champu
5. NeelakandhaVijayaChampu
6. Viswagunadarsa Champu
- 7.Purvabharatha Champu

Essential Reading:

A Short History of Sanskrit Literature

Module IV

Major Sanskrit authors of Kerala

- 1.Sankaracharya
2. Melputhur NarayanaBhattapada
- 3.Fr. John Kunnappilly



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4. Chattambi Swamikal

5. Sreenarayanaguru

6. Punnassery Neelakandha Sarma

7. Swathi thirunal

Essential Reading: Kerala Contribution to Sanskrit Literature

Module V

Classical Performing Arts of Kerala

Koodiyattam

Koothu

Ramanattam

Krishnanattam

Essential Reading: - Kalalokam

Module VI

Translation -

Essential Reading: - SamskrtaDipika Part 3

Management Principles in Sanskrit

CC21USKT 5 D (01) Management Principles in Sanskrit

Module I

Bhagavadgita-Chapter3

(Slokas and their meaning)

Essential Reading:

Bhagavadgita-Chapter 3

Karmayoga



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Module II

Bhagavadgita and Modern Management

Essential Reading: -Bhagavadgita and Modern Management: -

C.V.Jayamani

Indian Traditions of Management

Calicut University Publication Division

മലയാളസാഹിത്യം 1

MAL1A07(1) മലയാളസാഹിത്യം 1

മൊഡ്യൂൾ 1

മലയാള കവിതാസാഹിത്യത്തിലെ ആദ്യകാല കൃതികൾ. കവിതകളുടെ പൊതുസ്വഭാവങ്ങൾ. കവികളെപ്പറ്റിയുള്ള സാമാന്യവിവരണങ്ങൾ എന്നിവ. ഒരു കാവ്യഭാഗം മാത്രമേ പാഠ്യവിഷയമാവുന്നുള്ളൂ എങ്കിലും കാവ്യത്തെപ്പറ്റി സാമാന്യധാരണ വിദ്യാർത്ഥികൾക്ക് ലഭിച്ചിരിക്കണം.

1. ചെറുശ്ശേരി : കാളിയമർദ്ദനം (കൃഷ്ണഗാഥ)
ബാലകന്മാരുമായി.....
.....മസ്കകം കൊണ്ടടിച്ചു ചെമ്മേ
(എൺപത് വരി)
2. എഴുത്തച്ഛൻ : ലക്ഷ്മണ സാന്ത്വനം (അദ്ധ്യായ രാമായണം)
ലക്ഷ്മണവീരൻ സുമിത്രയാമമ്മയെ.....
.....രാഘവൻ തന്നെ പിരിഞ്ഞാൽപൊറുക്കുമോ?
(അൻപത്തിനാല്പതു വരി)
3. പുന്താനം : ജ്ഞാനപ്പാന
സ്ഥാനമാനങ്ങൾ ചൊല്ലിക്കലഹിച്ചു.....
.....നാം വ്യഥാ
4. കുഞ്ചൻ നമ്പ്യാർ : രുക്മിണി സ്വയംവരം (ഓട്ടൻ തുള്ളൽ)
കുണ്ഡിനവാസികൾ ബോധി കേണം.....



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.....വേദിക്കരുതേ രുക്മിണി നിന്മതിമോ ദിക്കേണമടുത്തു വിവാഹം.

മൊഡ്യൂൾ 2

നാടൻപാട്ട്, വടക്കൻപാട്ട്, മാപ്പിളപ്പാട്ട് എന്നിങ്ങനെ വ്യത്യസ്തമാർന്നതും തനിമയുള്ളതുമായ സാഹിത്യശാഖയിലേക്കുള്ള പ്രവേശനം.

1. നാടൻ പാട്ട് :

എന്തു തന്റെ തീണ്ടലാണ്.....

2. വടക്കൻ പാട്ട് :

ആറ്റുമണമേൽ ഉണ്ണിയാർച്ച കുത്തു കാണാൻ പോയ കഥ
ആറ്റുമണമേലെ... ..

.....ആ നാടും വീടും കടന്ന് പോയി

3. മാപ്പിളപ്പാട്ട് :

മറിയക്കുട്ടിയുടെ കത്ത്: പുലിക്കോട്ടിൽ ഹൈദർ (കത്തുപാട്ടിന്റെ ആദ്യഭാഗം മാത്രം)

മൊഡ്യൂൾ 3 : കഥകൾ

മലയാള ചെറുകഥാസാഹിത്യത്തിന്റെ വളർച്ചയുടെ വിവിധ ഘട്ടങ്ങൾ പ്രതിനിധാനം ചെയ്യുന്ന കഥകളാണ് 3,4 മൊഡ്യൂളുകളിൽ ഉൾപ്പെടുത്തിയിരിക്കുന്നത്. ഓരോ കഥാകൃത്തിന്റേയും ഓരോ രചനകളെ മാത്രമെ ഉൾപ്പെടുത്തിയിട്ടുള്ളൂ. എങ്കിലും മുഴുവൻ രചനകളെക്കുറിച്ചും സാമാന്യമായ ധാരണ വിദ്യാർത്ഥിക്ക് ലഭിച്ചിരിക്കണം.

1. കാരൂർ : മോതിരം

2. കെ.സരസ്വതി അമ്മ : ഡബിൾ ആക്ട്

3. ഉറുബ് : രാച്ചിയമ്മ

മൊഡ്യൂൾ 4: കഥകൾ

1. എൻ.പി മുഹമ്മദ് : ഉള്ളൂരുക്കം

2. സി.വി ശ്രീരാമൻ : ഒട്ടുചെടി

3. ഗീതാ ഹിരണ്യൻ : ഘരെ ബായിരേ

4. പ്രമോദ് രാമൻ : തന്തത്താഴ്



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മലയാള സാഹിത്യം 2

MAL2A08(1)മലയാള സാഹിത്യം 2

- കുമാരനാശാൻ : നളിനി
നല്ല ഹൈമവതഭൂവിൽ.....
.....പാട്ടുകേട്ടപരമാർന്നു കൗതുകം
- ജി. ശങ്കരക്കുറുപ്പ് : സൂര്യകാന്തി
- ഇടപ്പള്ളി : മണിനാദം
മൊഡ്യൂൾ 2. കവിതകൾ

മലയാള കവിതയുടെ ആധുനിക ഘട്ടം മുതൽ ഇന്നത്തെ മലയാള കവിത വരെ. പ്രമേയ സ്വീകരണം, അവതരണം എന്നിവയിലെ വ്യതിയാനങ്ങളെപ്പറ്റി വ്യക്തമായ ധാരണ രൂപപ്പെടണം.

- അക്കിത്തം : കലോപാസകൻ(കരതലാമലകം)
- അയ്യപ്പപ്പണിക്കർ : കുതിരക്കൊമ്പ്
- ആറ്റൂർ : പുത്തൻചൊല്ല്
- സാവിത്രി രാജീവൻ : അമ്മയെ കുളിപ്പിക്കുമ്പോൾ

മൊഡ്യൂൾ 3,4 : വിമർശനം/ നിരൂപണം

മലയാള സാഹിത്യത്തിലെ വിമർശന രൂപങ്ങളെയും പ്രസ്ഥാനങ്ങളെയും പരിചയപ്പെടുത്തുക.

- കുട്ടികൃഷ്ണമാരാർ : അംബ
- മുണ്ടശ്ശേരി : കാളിദാസനും കാലത്തിന്റെ ദാസൻ
- കെ.പി അപ്പൻ : മരണത്തിന്റെ സൗന്ദര്യം (ക്ഷോഭിക്കുന്നവരുടെ സുവിശേഷം)
- കൽപ്പറ്റ നാരായണൻ : സ്ത്രീയില്ലാത്ത മാതൃഭൂമി (കവിതയുടെ ജീവചരിത്രം)
- പി.കെ രാജശേഖരൻ : എഴുത്തും അധികാരവും(അന്ധനായ ദൈവം)

മലയാള സാഹിത്യം 3

MAL3A09 മലയാള സാഹിത്യം 3



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

മൊഡ്യൂൾ 1 : നാടകം

നാടകം, നാടക സാഹിത്യചരിത്രം എന്നിവയെപ്പറ്റി സാമാന്യമായ അറിവ് ലഭിച്ചിരിക്കണം.

1. ജി. ശങ്കരപ്പിള്ള : ഭരതവാക്യം
2. വയലാ വാസുദേവൻപിള്ള : തനതു നാടക ദർശനം (ലേഖനം) (നാടകങ്ങൾ, നാടക പഠനങ്ങൾ)

മൊഡ്യൂൾ 2 : തിരക്കഥ

ചലച്ചിത്രകലയെക്കുറിച്ചുള്ള സാമാന്യമായ അറിവ്. തിരക്കഥ എന്ന സാഹിത്യവിഭാഗത്തെ പരിചയപ്പെടൽ

1. എം.ടി വാസുദേവൻനായർ : പെരുന്തച്ചൻ (തിരക്കഥ)
2. അടൂർ ഗോപാലകൃഷ്ണൻ

മൊഡ്യൂൾ 3 : ആത്മകഥ/ സ്മരണ

സംവിധായകന്റെ കല (ലേഖനം) (സിനിമയുടെ ലോകം)

ആത്മകഥ, ജീവചരിത്രം തുടങ്ങിയ സാഹിത്യരൂപങ്ങളെ പരിചയപ്പെടൽ

1. വി.ടി. ഭട്ടതിരിപ്പാട് : കെടാത്ത തീനാളങ്ങൾ (കണ്ണീരും കിനാവു)
2. പി. കുഞ്ഞിരാമൻനായർ : പുഷ്പഗോപുരം (കവിയുടെ കാൽപ്പാടുകൾ)
3. റോസി തോമസ് : നീലക്കടലാസിൽ പൊതിഞ്ഞ പച്ചക്കുതിര (ഇവനെന്റെ പ്രിയ സി.ജെ)
4. ഇച്ചര വാര്യർ : കരുതിവെച്ച ഒരിലച്ചോറ് (ഒരച്ഛന്റെ ഓർമ്മക്കുറിപ്പുകൾ)

മൊഡ്യൂൾ 4 : സഞ്ചാരസാഹിത്യം

മലയാള സഞ്ചാരസാഹിത്യ ശാഖയെ കുറിച്ച് സാമാന്യധാരണ രൂപപ്പെടുത്തുക.

1. രാജൻ കാക്കനാടൻ : ഹിമവാന്റെ മുകൾത്തട്ടിൽ

മലയാള സാഹിത്യം 4

MAL4A10 മലയാള സാഹിത്യം 4



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

ഭാഷ, എഴുത്ത്, വിവർത്തനം, സംസ്കാരപഠനം എന്നിവക്കൊപ്പം നോവൽ എന്നസാഹിത്യ രൂപത്തെയും പരിചയപ്പെടുത്തുക.
മൊഡ്യൂൾ 1

1. കെ.എം പ്രഭാകരവാര്യാർ : ഭാഷയും ആശയ വിനിമയവും (ഭാഷയും മനശ്ശാസ്ത്രവും)
2. സി. വി. വാസുദേവഭട്ടതിരി : വ്യമാനമൂലത (നല്ല മലയാളം)
3. എം.എൻ കാരശ്ശേരി : തീറ്റയും ജനാധിപത്യവും, ഭംഗിവാക്ക് (തായ്മൊഴി)
4. പി. പവിത്രൻ : ഡോക്ടർമാരുടെ രോഗം, വേൽ സൗന്ദര്യാത്മക വിദ്യാഭ്യാസം (മാതൃഭാഷയ്ക്ക്വേിയുള്ള സമരം)

മൊഡ്യൂൾ 2 : വിവർത്തനംവിവർത്തനം നിർവ്വചനങ്ങൾ പൊതുതത്വങ്ങൾ, വിവർത്തനരീതികൾ ലിപ്യന്തരണം. വിവർത്തനത്തിന്റെ സാംസ്കാരിക ധർമ്മം എന്നിവയെ കുറിച്ച് സാമാന്യധാരണ രൂപപ്പെടുത്തുക.

1. കെ.പി ശങ്കരൻ : അപ്രാപ്യമായ ഒരു വിതാനം (ലേഖനം)
2. റൂമി : വ്യാജസൂചനകൾ (കവിത) (വിവർത്തനം. കെ. ജയകുമാർ)
3. ഓംപ്രകാശ് വാൽമീകി : എച്ചിൽ (ത്യാഗി ഇന്റർ കോളേജ് ഗ്രാമത്തിനു പുറത്താണ്.....കടന്ന് വന്നിരുന്നു എന്ന് നിസ്സംശയം വരെ)

കൂടാതെ, ആശയവിനിമയ രീതികളുടെ പരിശീലനം പൊതു വിഷയത്തെ ആസ്പദമാക്കി ഉപന്യാസ രചന പരിശീലിക്കൽ, വാക്യങ്ങളിലെ തെറ്റ് തിരുത്താൻ പഠിക്കുക, സത്തചോർന്ന് പോകാതെ സംഗ്രഹിക്കാൻ പരിശീലിക്കുക.

മൊഡ്യൂൾ 3 : സാംസ്കാരിക ചരിത്രം

1. എം. ഗോവിന്ദൻ : അറിവിന്റെ ഫലങ്ങൾ (എം. ഗോവിന്ദന്റെ ഉപന്യാസങ്ങൾ)
2. എം.വി വിഷ്ണുനമ്പൂതിരി : വ്യക്തിനാമപഠനങ്ങൾ (നാട്ടറിവും നാമപഠനവും 6.1 മുതൽ 6.6 വരെ ഭാഗങ്ങൾ)
3. എം. കെ സാനു : മനുഷ്യരെല്ലാം സോദരർ (നാരായണഗുരുസ്വാമി അദ്ധ്യായം 12)

മൊഡ്യൂൾ 4 : നോവൽ

1. നന്ദനാർ : അനുഭവങ്ങൾ



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മലയാള സാഹിത്യ പഠനം 1

MAL1A07(2) മലയാള സാഹിത്യ പഠനം 1

മൊഡ്യൂൾ 1

1. എം.പി പോൾ : സൗന്ദര്യനിരീക്ഷണം(ആദ്യത്തെലേഖനം)
2. എസ്. ഗുപ്തൻ നായർ : സ്വാതിയുടെ സന്നിധിയിൽ (സമാലോചനയും പുനരാലോചനയും)
3. എം.എൻ വിജയൻ : സ്വർണ്ണമത്സ്യങ്ങൾ (ചിതയിലെ വെളിച്ചം)
4. സുകുമാർ അഴീക്കോട് : മതവും മതങ്ങളും (നവയാത്രകൾ)

മൊഡ്യൂൾ 2 : കഥകൾ

1. സുചിമുഖി : മലയാറ്റൂർ
2. അയൽരാജാവ് : എം. സുകുമാരൻ
3. ഒരിതൾ : മാനസി

മൊഡ്യൂൾ 3 : നോവൽ

1. നൂറു സിംഹാസനങ്ങൾ : ജയമോഹൻ

മൊഡ്യൂൾ 4 യാത്രാവിവരണം

1. കൂടക് യാത്രകൾ : എൻ. പ്രഭാകരൻ

മലയാള സാഹിത്യ പഠനം 2

MAL2A08(2)മലയാള സാഹിത്യ പഠനം 2

മൊഡ്യൂൾ 1 കവിത

1. എന്റെ ഭാഷ : വള്ളത്തോൾ
2. മഴുവിന്റെ കഥ : ബാലാമണിയമ്മ
3. സഫലമീയാത്ര : എൻ.എൻ കക്കാട്

മൊഡ്യൂൾ 2 കഥ

1. ബംഗ്ലാവ് : ടി.വി കൊച്ചുബാവ



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- 2. ദൃഷ്ടാന്തൻ മാഷ് : വി.കെ.എൻ
- 3. തായ് കുലം : സാനാ ജോസഫ്
- 4. മോദസ്വിതനായങ്ങ് വസിപ്പു മല പോലെ : എസ് ഹരീഷ്

മൊഡ്യൂൾ 3 നാടകം

- 1. സാകേതം : സി. എൻ. ശ്രീകണ്ഠനായർ

മൊഡ്യൂൾ 4 ആത്മകഥ/ജീവചരിത്രം

- 1. ഒരു സിന്ധുരപൊട്ടിന്റെ ഓർമ്മയ്ക്ക് : ഒ.വി വിജയൻ(ഒ.വി വിജയന്റെ ലേഖനങ്ങൾ)
- 2. ഷാരോണിലെ റോസാപ്പൂക്കൾ : വൈക്കം ചന്ദ്രശേഖരൻ നായർ(അക്ഷരങ്ങൾ)
- 3. പാവക്കൂട്ടി : മാധവിക്കൂട്ടി (വർഷങ്ങൾക്ക് മുമ്പ്)

മലയാളഭാഷയും സാഹിത്യവും 1

MAL1A07(3)മലയാളഭാഷയും സാഹിത്യവും 1

മൊഡ്യൂൾ 1 ലേഖനങ്ങൾ

- 1. കലയും ആവിഷ്കാരവും (ഒന്നാം ഭാഗം) : നിത്യചൈതന്യയതി
- 2. ഞങ്ങൾ നിങ്ങൾക്ക് ഭൂമി വിറ്റാൽ : സിയാറ്റിൽ മുപ്പൻ
- 3. കണ്ടൽ ജീവിതം : പൊക്കുടൻ

മൊഡ്യൂൾ 2 കഥകൾ

- 1. ബോൺസായികൾ : കോവിലൻ
- 2. ലോല എന്ന അമേരിക്കൻ പെൺകിടാവ് : പത്മരാജൻ
- 3. ഒത്തുതീർപ്പുകൾ : അഷിത

മൊഡ്യൂൾ 3 സഞ്ചാരസാഹിത്യം

- 1. കാപ്പിരികളുടെ നാട്ടിൽ : എസ്.കെ പൊറ്റക്കാട്ട്

മൊഡ്യൂൾ 4 കവിതകൾ

- 1. ബുദ്ധനും ഞാനും നരിയും : ഇടശ്ശേരി
- 2. കൊല്ലേതെങ്ങനെ : സുഗതകുമാരി



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3. മീര പാടുന്നു : സച്ചിദാനന്ദൻ
4. പല പോസിലുള്ള ഫോട്ടോകൾ : കെ.ജി.എസ്

മലയാള ഭാഷയും സാഹിത്യവും 2

MAL2A08(3) മലയാള ഭാഷയും സാഹിത്യവും 2

മൊഡ്യൂൾ 1 കഥകൾ

1. ഒരു മനുഷ്യൻ : ബഷീർ
2. വൻമരങ്ങൾ വീഴുമ്പോൾ : എൻ.എസ് മാധവൻ
3. പയറുവള്ളികളിൽ തൂങ്ങി നമ്മളൊക്കെ : പ്രിയ എ. എസ്

മൊഡ്യൂൾ 2 നോവൽ

1. എൻമകജെ : അംബികാസുതൻമാങ്ങാട്

മൊഡ്യൂൾ 3 നാടകം

1. ഭഗവതം : എൻ. കൃഷ്ണപിള്ള

മൊഡ്യൂൾ 4 ആത്മകഥ/സ്മരണ

1. പാവം മനുഷ്യൻ : ചെറുകാട്(ജീവിതപ്പാത)
2. സന്താനഗോപാലം : എം.എൻ.പാലൂർ (കഥയില്ലാത്തവന്റെ കഥ)
3. ഉത്സവകാലം : ചന്ദ്രമതി (ഈക്കളുടെ നാട്ടിൽ ഒരിടവേള)

C01കേരള പഠനം പൂർവ്വകാലം, മധ്യകാലം

MAL1(2)C01കേരള പഠനം പൂർവ്വകാലം, മധ്യകാലം

മൊഡ്യൂൾ 1

സംസ്കാരം നിർവചനങ്ങൾ സംസ്കാരത്തെക്കുറിച്ചുള്ള വിവിധ കാഴ്ചപ്പാടുകൾ ചരിത്രവും സംസ്കാരവും തമ്മിലുള്ള ബന്ധം കേരളചരിത്ര രചനാ പരിശ്രമങ്ങൾ സാധ്യതകളും പരിമിതികളും കേരളോല്പത്തിയുമായി



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ബന്ധപ്പെട്ട കഥകളുടെ വിലയിരുത്തൽ കേരളസംസ്കാരപഠനത്തിന് സഹായകമായ ഉപാദാനങ്ങൾ.

കേരളം ഭൂമിശാസ്ത്രപരമായ പ്രത്യേകതകൾ ആദിമനിവാസികൾ ഗോത്രസംസ്കൃതി മഹാ ശിലാ സംസ്കാരം ആദ്യകാല വിദേശബന്ധങ്ങൾ വിദേശ ബന്ധങ്ങൾ കൊണ്ടു സാംസ്കാരിക നേട്ടം.

മൊഡ്യൂൾ 2

സംഘകാലത്തെ കേരളം ഗണത്തിന്റേയും തൊഴി ലിന്റേയും അടിസ്ഥാനത്തിലുള്ള സാമൂഹ്യ വിഭജനം സാംസ്കാരിക ജീവിതം കാർഷിക സംസ്കൃതി രാഷ്ട്രീയ ചരിത്രം ആചാരാനുഷ്ഠാനങ്ങൾ ഭാഷ സാഹിത്യകൃതികൾ ബുദ്ധ ജൈന മതങ്ങളുടെ സംഭാവനകൾ.

കാർഷികവൽക്കരണവും ആര്യാഗമനവും സാമ്പത്തിക, സാമൂഹിക, സാംസ്കാരിക, രംഗങ്ങളിൽ സംഭവിച്ച മാറ്റം ബ്രഹ്മണ ഗ്രാമങ്ങളുടെ രൂപീകരണം ക്ഷേത്രസംസ്കാരത്തിന്റേ ആരംഭം പെരുമാൾ വാഴ്ച ഭരണരംഗം മൊഡ്യൂൾ 3

വിവിധ മതങ്ങൾ ജൂതമതം, ഇസ്ലാം മതം, ക്രിസ്തുമതം ശ്രീശങ്കരനും അദ്വൈതവും ബുദ്ധ ജൈന മതങ്ങളുടെ തകർച്ച ബ്രഹ്മണാധിപത്യം ജാതിവ്യവസ്ഥ ഉണ്ടവം, ജാതിയും തൊഴിലും, ജാതിയും ഉപജാതികളും

പുതിയ സാമൂഹിക വിഭാഗങ്ങളുടെ രൂപപ്പെടൽ ജന്മിത്തം, ഊരാളർ, കാരാളർ, അടിയാളർ കച്ചവട സംഘങ്ങൾ മൂന്നൂറ്റവർ, അറുനൂറ്റവർ അങ്ങാടികൾ കച്ചങ്ങൾ ദായകമം മരുമക്കത്തായം നാടുവാഴികളും സ്വരൂപങ്ങളും വേണാട്, കൊച്ചി, കോഴിക്കോട്, കോലത്തുനാട്, അറയ്ക്കൽ രാജവംശങ്ങൾ

മൊഡ്യൂൾ 4

ക്ഷേത്ര കേന്ദ്രിത സംസ്കാരം വിദ്യാലയങ്ങൾ, വേദപഠനശാലകൾ, പട്ടത്താനം, കടവല്ലൂർ അന്യോന്യം, ദേവദാസികൾ, കുത്ത്, കൂടിയാട്ടം, അനുഷ്ഠാനകലകൾ തെയ്യം, മുടിയേറ്റ്, പടയണി ഭാഷയുടെ വളർച്ച പാട്ടും മണിപ്രവാളവും നാടൻ പാട്ടുകൾ വടക്കൻ പാട്ട്, തെക്കൻ പാട്ട് വിജ്ഞാന രംഗത്തായ വളർച്ച ഗണിതം, ജ്യോതിശാസ്ത്രം, വാസ്തുവിദ്യ ലോഹ വ്യവസായം, ആയുർവേദം.



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{ബാഹ്‌മനാധിപത്യത്തിന്റെ രൂക്ഷഫലങ്ങൾ അയിത്തം, മണ്ണാപ്പേടി, പുലപ്പേടി, ശിക്ഷാരീതികൾ, സ്കാർത്ത വിചാരം, കളരി, അങ്കം, പൊയ്‌ത്ത്, മാമാങ്കം ഉത്സവാഘോഷങ്ങൾ, ഓണം, തിരുവാ തിര, പുരം, വേല

- ലൈബ്രറി റെക്കോഡിംഗ് ക്ലബ്ബുകൾ (5 എണ്ണം)
1. കേരളചരിത്രത്തിന്റെ അടിസ്ഥാന ശിലകൾ എം.ജി. എസ് നാരായണൻ
 2. കേരളീയത ചരിത്രമാനങ്ങൾ എം.ആർ രാഘവവാര്യാർ
 3. ബുദ്ധമതവും കേരളവും എസ്.ശങ്കു അയ്യർ
 4. സാഹിത്യവും ചരിത്രവും ധാരണയുടെ സാധ്യതകൾ കേശവൻവെളുത്താട്ട്
 5. സംഘകാല ഭരണ സംവിധാനം സുബ്രഹ്മണ്യൻ.എൻ
 6. കേരളചരിത്രത്തിലെ അടിസ്ഥാന ശിലകൾ പുതുശ്ശേരി രാമചന്ദ്രൻ
 7. കേരളോല്പത്തിയും മറ്റും സ്കന്ധീയ സകന്ധീയ(എഡി)
 8. കേരളം ആദ്യനൂറ്റാണ്ടുകളിൽ പുരത്തൂർ ശ്രീധരൻ
 9. ചില കേരള ചരിത്ര പ്രശ്നങ്ങൾ ഇളംകുളം കുഞ്ഞൻപിള്ള
 10. കേരളത്തിലെ ഇരുട്ടടത്തപ്പട്ടികൾ ഇളംകുളം കുഞ്ഞൻപിള്ള
 11. സംസ്കാരപഠനം ഒരു ആമുഖം രവീന്ദ്രൻ പി.പി
 12. സംസ്കാരിക വിശകലനത്തിന് ഒരു രീതിശാസ്ത്രം ജെ.ജെ പള്ളത്ത്
 13. പുറനാനൂറ് ഒരു പഠനം കവിയൂർ മുരളി
 14. ജൈനമതം കേരളത്തിൽ എം.ആർ രാഘവവാര്യാർ
 15. ജാതിവ്യവസ്ഥിതിയും കേരളചരിത്രവും പി.കെ ബാലകൃഷ്ണൻ
 16. മധ്യ കാല കേരളം: സമ്പത്ത്, സമൂഹം, സംസ്കാരം എം.ആർ രാഘവവാര്യാർ
 17. ഉണ്ണൂനീലി സന്ദേശം ചരിത്ര ദൃഷ്ടിയിൽ ഇളംകുളം കുഞ്ഞൻപിള്ള
 18. ജാതിവ്യവസ്ഥ രാമനോഹർലോഹ്യ (വി.വ വിനോദ് പയ്യട)
 19. ജന്മിസമ്പ്രദായം കേരളത്തിൽ ഇളംകുളം കുഞ്ഞൻപിള്ള
 20. ജാതിവ്യവസ്ഥാ പഠനങ്ങൾ എം. ഗംഗാധരൻ (എഡി)
 21. കൂത്തും കൂടിയാട്ടവും അമ്മാവൻ തമ്പുരാൻ



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21. കളരിപ്പയറ്റ്: കേരളത്തിന്റെ ശക്തിയും സൗന്ദര്യവും സാംസ്കാരികപ്രസിദ്ധീകരണ വകുപ്പ്
23. ആയുർവേദത്തിന്റെ കേരളീയ അനുഷ്ഠാന പാരമ്പര്യം വൈദ്യമഠം ചെറിയ നാരായണൻ നമ്പൂതിരി.
24. കേരളീയ ചികിത്സാ ചരിത്രം വിനയചന്ദ്രൻ പി
25. കേരളത്തിന്റെ ബുദ്ധമത പാരമ്പര്യം നാട്ടറിവുകളിലൂടെ അജു നാരായണൻ
26. മാമാങ്കം രേഖകൾ എൻ.എം നമ്പൂതിരി
27. വേണാടിന്റെ പരിണാമം ശിവ ശങ്കരൻ നായർ കെ
28. കേരളത്തിലെ ഗണിത പാരമ്പര്യം എൻ.എൻ മുസത്
29. കേരളത്തിലെ ഉത്താലകൾ വി.എച്ച് ദിരാർ

കേരള പഠനം അധിനിവേശകാലം, ആധുനികകാലം

MAL4(3) C02 കേരള പഠനം അധിനിവേശകാലം, ആധുനികകാലം മൊഡ്യൂൾ 1

പാശ്ചാത്യ അധിനിവേശം പോർച്ചുഗീസുകാർ ആധിപത്യവും തകർച്ചയും തുഹ്ഫത്തുൽ മുജാഹിദീൻ ശൈഖ് സൈനുദ്ധീൻ മഖ്ലൂം സാമൂതിരി കുഞ്ഞാലി മരക്കാർ ഡച്ചുകാരുടെ ആധിപത്യശ്രമം തകർച്ച മാർത്താണ്ഡവർമ്മയും തിരുവിതാംകൂറും ഫ്രഞ്ച് അധിനിവേശം.

മൈസൂർ ആക്രമണം ഹൈദരാലി ടിപ്പു ടിപ്പുവിന്റെ സാമൂഹ്യപരിഷ്കരണശ്രമങ്ങൾ മൈസൂർ ആധിപത്യത്തിന്റെ ഫലങ്ങൾ ബ്രിട്ടീഷ് അധിനിവേശവും ചെറുത്തു നില്ക്കുകയും നാട്ടുരാജ്യങ്ങളുടെ തകർച്ച കലാപങ്ങൾ പഴശ്ശിരാജ പാലിയത്തച്ഛൻ വേലുതമ്പി ദളവ മൊഡ്യൂൾ 2



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സാമൂഹിക സാമ്പത്തിക സാംസ്കാരിക രംഗങ്ങളിലായ മാറ്റങ്ങൾ ഉദയം പേരൂർ സുന്നഹ റോസ് കുന്നൻ കുരിശു സത്യം അധിനിവേശ പ്രതിരോധം ഭക്തിപ്രസ്ഥാനം എഴുത്തച്ഛന്റെ സംഭാവന പുന്താനം അറബി മലയാളം മാപ്പിളപ്പാട്ടുകൾ മൊഹിയുദ്ധീൻ മാല കുഞ്ഞായിൻ മുസ്ലിയാർ നമ്പ്യാരും തുള്ളൽ പ്രസ്ഥാനവും കഥകളി ചവിട്ടു നാടകം പാശ്ചാത്യബന്ധങ്ങളും വൈജ്ഞാനിക നവീകരണങ്ങളും ഹോർത്തൂസ് മലബാറിക്കസ് ജാതി വിരുദ്ധതയും മിഷനറി പ്രവർത്തനങ്ങളും മതപരിവർത്തനം ചാന്നാർ ലഹള ഇംഗ്ലീഷ് വിദ്യാഭ്യാസം അച്ചടി ഗദ്യവികാസം പത്രമാസികകൾ നിഘണ്ടു വിവർത്തന കൃതികൾ പുതിയ സാഹിത്യ ജനുസ്സുകളുടെ ആവിർഭാവം ഭാഷാപരിഷ്കരണം ഭാഷാ പോഷിണിസഭ ഹെർമൻ ഗുർട്ട് ജോർജ്ജ് മാത്തൻ കേരള വർമ്മ എ.ആർ. രാജരാജവർമ്മ പച്ചമലയാള പ്രസ്ഥാനം സാഹിത്യത്തിലെ നവോത്ഥാന ശ്രമങ്ങൾ.

മൊഡ്യൂൾ 3

കേരളീയ നവോത്ഥാനം സാമൂഹ്യ പരിഷ്കരണ പ്രസ്ഥാനങ്ങൾ അയ്യം വൈകുണ്ഠൻ, ബ്രഹ്മാനന്ദ ശിവയോഗി, ചട്ടമ്പി സ്വാമികൾ, ശ്രീനാരായണഗുരു എസ്.എൻ.ഡി.പി അയ്യങ്കാളി സാധുജന പരിപാലന സംഘം സഹോദര-അംഗം= പൊയ്ക്കയിൽ കുമാരഗുരു പ്രത്യക്ഷ രക്ഷാ സഭ മന്നത്ത് പത്മനാഭൻ എൻ.എസ്.എസ് പാമ്പാടി ജോൺ ജോസഫി.ടി ഭട്ടതിരിപ്പാട് വാഗ്ഭടാനന്ദൻ മക്തി തങ്ങൾ, വക്കം മൗലവി

ജന്മിവിരുദ്ധ സാമ്രാജ്യവിരുദ്ധ മുന്നേറ്റങ്ങൾ മലയാളി മെമ്മോറിയൽ, ഈഴവ മെമ്മോറിയൽ, സിവിൽ നിയമ ലഘുലേഖനം, മലബാർ കലാപം, ഉത്തരവാദി ഭരണ പ്രക്ഷോഭം നിവർത്തന പ്രക്ഷോഭം ക്വിറ്റ് ഇന്ത്യാ പ്രക്ഷോഭം വൈക്കം, ഗുരു വായൂർ, പാലിയം സത്യാഗ്രഹങ്ങൾ, ക്ഷേത്രപ്രവേശന വിളംബരം പുനപ്രവേശനം, കരിവെള്ളൂർ സമരങ്ങൾദേശീയ പ്രസ്ഥാനംകർഷക പ്രസ്ഥാനം തൊഴിലാളി പ്രസ്ഥാനംകമ്മ്യൂണിസ്റ്റ് പ്രസ്ഥാനം

മൊഡ്യൂൾ 4

സ്വാതന്ത്രാനന്തരകേരളം ഐക്യകേരളം സംസ്ഥാന രൂപീകരണം 1957 ലെ ഒന്നാം മന്ത്രിസഭ കർഷകബന്ധിപ്പും വിദ്യാഭ്യാസബിപ്പും വിമോചന സമരം പഞ്ചവത്സര പദ്ധതികൾ തീവ്ര ഇട തുപക്ഷ പ്രസ്ഥാനം സാക്ഷരതാ



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പ്രവർത്തനം, പരിസ്ഥിതിപ്രസ്ഥാനങ്ങൾ സ്ത്രീ ശാക്തീകരണം ദലിത്, ആദിവാസി മുന്നേറ്റം സർവ്വീസ് മേഖലയുടെ വളർച്ച പ്രവാസവും കേരള വികസനവും രാഷ്ട്രീയ ചരിത്രം.

പുതിയ ചിന്തകൾ സമീപനങ്ങൾകലാ സാഹിത്യരംഗത്തായ മാറ്റംപുരോഗമനസാഹിത്യ പ്രസ്ഥാനം ഗ്രന്ഥശാലാ പ്രസ്ഥാനം കലാമണ്ഡലംവിവിധ അക്കാദമികൾ സംസ്കാരിക സ്ഥാപനങ്ങൾ നാടകം, സിനിമ തുടങ്ങിയ ദൃശ്യമാധ്യമ രംഗത്തായ വളർച്ച ചലച്ചിത്ര ഗാനങ്ങൾ വിദ്യാഭ്യാസ രംഗത്തായ മാറ്റങ്ങൾ റേഡിയോ ടെലിവിഷൻ നവ മാധ്യമങ്ങളും സംസ്കാര സ്വരൂപവും നവ സാമൂഹ്യ പ്രസ്ഥാനങ്ങൾ.

ലൈബ്രറി റെക്കോഡലേഷൻ ക്ലബ്ബ് പുസ്തകങ്ങൾ (5 എണ്ണം)

1. പത്തൊമ്പതാം നൂറ്റാണ്ടിലെ കേരളം പി. ഭാസ്കരനൂണി
2. മലബാർമാന്വൽ വിലയം ലോഗൻ
3. ഉദയം പേരൂർ സുന്നഹദോസിന്റെ കനോനുകൾ സ്കന്റിയ സകന്റിയ
4. സാമൂതിരി ചരിത്രത്തിലെ കാണാപ്പുറങ്ങൾ എൻ.എം നമ്പൂതിരി
5. കേരളത്തിലെ നാടോടി സംസ്കാരം കാവാലം നാരായണപ്പണിക്കർ
6. കേരള പത്രപ്രവർത്തന ചരിത്രം പുതുപ്പള്ളി രാഘവൻ
7. നായർ മേധാവിത്വത്തിന്റെ പതനം റോബിൻ ജോഫി
8. അച്ചടിയും ആധുനികതയും ഇ.വി രാമകൃഷ്ണൻ
9. കേരളത്തിലെ സാമൂഹ്യപരിവർത്തനം സാമൂവൽ നെല്ലിമുകൾ
10. കേരളം പതിനഞ്ചും പതിനാറും നൂറ്റാണ്ടുകളിൽ ശൈഖ് സൈനുദ്ദീൻ (വിവ. വേലായുധൻ പണിക്കശ്ശേരി)
11. ഹോർത്തൂസ് മലബാറിക്കസ് ഡോ. മണിലാൽ
12. മലയാള സാഹിത്യവും ക്രിസ്ത്യാനികളും പി.ജെ തോമസ്
13. വാണിജ്യ കേരളം എം. ഗംഗാധരൻ
14. അത്തൂർ വർഷത്തെ കേരളം ചില അറിവടയാളങ്ങൾ വി.ജെ വർഗീസ്(എഡി)
15. പഴശ്ശി സമരങ്ങൾ കെ.കെ എൻ.കുറുപ്പ്
16. അറബിമലയാള സാഹിത്യപഠനങ്ങൾ ടി. മൻസൂറലി(എഡി)
17. ചരിത്രവും ആധുനികതയും ടി.ടി ശ്രീകുമാർ



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18. ദലിത് പഠനം:സ്വത്വം, സംസ്കാരം, സാഹിത്യം പ്രദീപൻ പാമ്പരിക്കുന്ന്
19. മലബാർകലാപം പ്രഭുത്വത്തിനും, രാജ്യത്വത്തിനുമെതിരെ കെ.എൻ പണിക്കർ
20. കേരളത്തിന്റെ ദേശീയ പ്രസ്ഥാനം ഇ.എം.എസ്
21. അയ്യങ്കാളി നടത്തിയ സ്വാതന്ത്ര്യ സമരങ്ങൾ ടി.പി.എച്ച് ചെന്താരശ്ശേരി
22. ശ്രീനാരായണഗുരു ഒരു സമഗ്രപഠനം വിജയാലയം ജയകുമാർ
23. പൊയ്ക്കയിൽ ശ്രീ കുമാരഗുരു:ജീവിതവും ദർശനവും ജോസഫ് പി.സി
24. വാഗ്ഭടാനന്ദഗുരുവും സാമൂഹിക നവോത്ഥാനവും എം.എസ് നായർ
25. സഹോദരൻ എന്ന വിപ്ലവകാരി പ്രശോഭൻകെ (എഡി)
26. മലയാളിയുടെ ദേശകാലങ്ങൾ കെ.എൻ ഗണേഷ്
27. കേരളനവോത്ഥാനം ഒരു മാർക്സിസ്റ്റ് വീക്ഷണം പി. ഗോവിന്ദപ്പിള്ള
28. ശ്രീനാരായണഗുരു പുനർ വായനകൾ പ്രദീപൻ പാമ്പരിക്കുന്ന്(എഡി)
29. അയ്യങ്കാളി മുതൽ വി.ടി വരെ വേലായുധൻ പണിക്കശ്ശേരി
30. പണ്ഡിറ്റ് കറുപ്പൻ ഓർമ്മകളിലൂടെ വേലായുധൻ കെ.കെ

സഹായകഗ്രന്ഥങ്ങൾ

1. കേരളചരിത്രം ഡീഹ 1,2 കേരള ഹിസ്റ്ററി അസോസിയേഷൻ
2. ഇളംകുളം കുഞ്ഞൻപിള്ളയുടെ തെരഞ്ഞെടുത്ത കൃതികൾ ഇളംകുളം കുഞ്ഞൻപിള്ള
3. കേരള ചരിത്രം, കേരള സംസ്കാരം എ. ശ്രീധരമേനോൻ
4. കേരളചരിത്രം എം.ആർരാഘവവാർ, രാജൻ ഗുരുക്കൾ
5. കേരളചരിത്രം കെ. ദാമോദരൻ
6. കേരളത്തിന്റെ സംസ്കാരിക ചരിത്രം പി.കെ ഗോപാലകൃഷ്ണൻ
7. ചരിത്രം വ്യവഹാരം:കേരളവും ഭാരതവും എം.ജി.എസ് നാരായണൻ
8. കേരളത്തിന്റെ ഇന്നലെകൾ കെ.എൻ ഗണേഷ്
9. കേരളം ഇന്ന്, നാളെ കെ.എൻ ഗണേഷ്
10. കേരള ചരിത്ര നിഘണ്ടു ഡീഹ 1,2 എസ്.കെ വസന്തൻ
11. കേരള ചരിത്ര വിചാരം സി.കെ കരീം
12. നമ്മുടെ സാഹിത്യം നമ്മുടെ സമൂഹം എം.എൻ വിജയൻ(എഡി)



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13. കേരളസംസ്കാരം എസ്.ആച്ചുതവാര്യർ
14. കേരളം മലയാളികളുടെ മാതൃഭൂമി ഇ.എം.എസ്
15. കേരള പഠനം കേരള ശാസ്ത്ര സാഹിത്യ പരിഷത്ത് 16. കേരളം മണ്ണും മനുഷ്യനും തോമസ് ഐസക്
17. കേരളസംസ്കാരം അകവും പുറവും എൻ.എം നമ്പൂതിരി
18. സാമൂഹിക നവോത്ഥാനവും സാഹിത്യവും ഡോ. എൻസാം
19. കേരളീയത ചരിത്രമാനങ്ങൾ എം.ആർ രാഘവവാര്യർ
20. കേരളം സംസ്കാരവും ചരിത്രവും ടി.കെ ഗംഗാധരൻ
21. കേരള ചരിത്രത്തിന്റെ അടിസ്ഥാന ശിലകൾ പുതുശ്ശേരി രാമചന്ദ്രൻ
22. കേരള സംസ്കാര പഠനങ്ങൾ പത്മനരാമചന്ദ്രൻ(എഡി)
23. സംസ്കാരപഠനം: ചരിത്രം സിദ്ധാന്തം പ്രയോഗം മലയാള പഠന സംഘം
24. കേരളചരിത്രം സത്യവും മിഥ്യയും ടി.എച്ച്.പി ചെന്താരശ്ശേരി
25. കേരളചരിത്രത്തിലെ അവഗണിക്കപ്പെട്ട ഏടുകൾ ടി.എച്ച്.പി ചെന്താരശ്ശേരി
26. ഏകജീവിതാനുഭവശാസ്ത്രം: ചലച്ചിത്രശാസ്ത്ര സംസ്കാര പഠനം പ്രദീപൻ പാമ്പരിക്കുന്ന്
27. കേരളത്തിന്മേലേ ആർ. ഗോപിനാഥൻ
28. കേരളചരിത്രവും സമൂഹരൂപീകരണവും കെ കെ കൊച്ചു
29. ജലധാരാലയം റ്റീ. ഗലൂമഹമ ഒഴെറിയ
30. ആമവാശി ടലേഹേലാലി റ്റീ. ഗലൂമഹമ ഗലമ്മി ഡലഹവേമേ
31. ഇമേല, ഇഹമ മൈറ അഴുമുശമി ഞലഹമശേരീ ശി ഗലൂമഹമ അയുമവമാ ഡശഷമുമി



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നവോത്ഥാന മലയാളകവിത

MAL1B01നവോത്ഥാന മലയാളകവിത

മൊഡ്യൂൾ 1

പാരമ്പര്യവും ആധുനികതയും കേരളവർമ്മയുടെയും രാജരാജവർമ്മയുടെയും സാഹിത്യസം

ഭാവനകൾ പ്രാസവാദം വെണ്മണിക്കവികൾ കൊടുങ്ങല്ലൂർക്കളരിപച്ചമലയാള പ്രസ്ഥാനം.

വിശദപഠനം

1. മയൂരസന്ദേശം(ആദ്യത്തെ 10 ശ്ലോകം) കേരളവർമ്മ
2. മലയവിലാസം ഏ.ആർ
3. കോമപ്പൻ കൂർ

മൊഡ്യൂൾ 2

കൊളോണിയൽ ആധുനികത നവോത്ഥാനം പാശ്ചാത്യ സ്വാധീനം കാല്പനികത വിലാ പകാവ്യം ഖണ്ഡകാവ്യങ്ങൾ ഭാവഗീതങ്ങൾ

വിശദപഠനം

1. ജാതിക്കുമ്മി(150) കെ.പി കറുപ്പൻ
2. ഒരു വിലാപം വി.സി ബാലകൃഷ്ണപ്പണിക്കർ
3. ലീല (ഒന്നാം സർഗ്ഗം) ആശാൻ
4. ഗ്രാമീണകന്യക കുറ്റിപ്പുറത്തു കേശവൻനായർ

മൊഡ്യൂൾ 3

സിംബോളിസം മിസ്റ്റിസിസം കാല്പനികവും കാല്പനികേതരവുമായ വഴികൾ യുക്തിബോധം സ്വതന്ത്രബോധം സാംസ്കാരികവും സൗന്ദര്യശാസ്ത്രപരവുമായ സംഘർഷങ്ങൾ

വിശദപഠനം

1. സർപ്പക്കാട് വൈലോപ്പിള്ളി
2. നിമിഷം ശങ്കരക്കുറുപ്പ്
3. സ്മൃതിമു?ആഴിമാടം ചന്മണ്ണുഴ



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4. പുള്ളുവപ്പെൺകൊടി പി. കുഞ്ഞിരാമൻനായർ

മൊഡ്യൂൾ 4

കാല്പനികതയുടെയും നിയമിതത്തിന്റേയും തുടർച്ചകൾ ആധുനികത സാമൂഹ്യബോധം നവലോകവും മൂല്യസങ്കല്പങ്ങളും വിശദപഠനം

1. ആഫ്രിക്ക എൻ.വി കൃഷ്ണവാര്യർ
2. ഇരുപതാം നൂറ്റാണ്ടിന്റെ ഇതിഹാസം (നരകം എന്നഖണ്ഡം) അക്കിത്തം
3. കോട്ടയിലെ പാട്ട് പുനലൂർ ബാലൻ
4. ചോറൂണ് ഒ.എൻ.വി

ലൈബ്രറി റെക്കോർഡിലേക്ക് താഴെ പറയുന്ന ഏതെങ്കിലും അഞ്ച് പുസ്തകം തിരഞ്ഞെടുക്കാം

1. പണിമുടക്കം ഇടശ്ശേരി
2. ഗജേന്ദ്രമോക്ഷം സുഗതകുമാരി
3. സർഗസംഗീതം വയലാർ
4. നങ്ങേമക്കുട്ടി ഒളപ്പമണ്ണ
5. കവി വെണ്ണിക്കുളം
6. ഉഷസ്സ് എം.എൻ പാലൂർ
7. പേരക്കിടാവ് യൂസുഫലി കേച്ചേരി
8. വിടവാങ്ങൽ ടി. ഉബൈദ്
9. കർമ്മവീരൻ പള്ളത്തുരാമൻ
10. എത്ര യാദൃച്ഛികം ജി. കുമാരപ്പിള്ള

സഹായകഗ്രന്ഥങ്ങൾ

1. മലയാളകവിതാസാഹിത്യചരിത്രം എം. ലീലാവതി
2. വർണ്ണരാജി എം. ലീലാവതി
3. കവിതയും കാലവും എം. അച്യുതൻ
4. നവമാലിക എസ്. ഗുപ്തൻനായർ
5. ആധുനിക സാഹിത്യം എസ്. ഗുപ്തൻനായർ
6. അന്ധിയുടെ പൂക്കൾ ചങ്ങമ്പുഴ കവിയും കവിതയും എസ്. ഗുപ്തൻനായർ
7. ആശാൻ കവിത ഒരു പഠനം മുശ്ശേരി



CRITERION	I	Curricular Aspects
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8. ആശാനും മലയാള സാഹിത്യവും ഇ.എം.എസ്
9. വെണ്മണിപ്രസ്ഥാനം അകവൂർ നാരായണൻ
10. മലയാളത്തിലെ ഖണ്ഡകാവ്യങ്ങൾ ഒരു പഠനം എം.പി പണിക്കർ
11. ആശാൻ കവിത ആധുനികാനന്തരപാഠങ്ങൾ പി. പവിത്രൻ
12. കാല്പനികത എന്നസ്വാതന്ത്ര്യ സമരം ബാബുജോസഫ്
13. കാവ്യകല കുമാരനാശാനിലൂടെ പി.കെ ബാലകൃഷ്ണൻ
14. വിലാപവും കലാപവും കവിതയിൽ എൻരാജൻ
15. നവോത്ഥാനന്തര കവിത എസ്. രാജശേഖരൻ
16. വൈലോപ്പിള്ളി കവിതാ സമീക്ഷ എസ് രാജശേഖരൻ
17. കവിതാധ്വനി എം. ലീലാവതി
18. കാവ്യവ്യൂത്പത്തി എം.പി ശങ്കുണ്ണിനായർ
19. ചങ്ങമ്പുഴക്കവിതയിലെ കാല്പനികത ഇ.കെ പുരുഷോത്തമൻ
20. കാവ്യലോകസ്മരണകൾ വൈലോപ്പിള്ളി

കഥാസാഹിത്യം

MAL2B02 കഥാസാഹിത്യം

മൊഡ്യൂൾ 1

ചെറുകഥയുടെ ഉദ്ഭവം പാശ്ചാത്യ സ്വാധീനം അച്ചടി ആനുകാലികങ്ങളുടെ വളർച്ച പരി

ഭാഷകൾ ആദ്യകാല ചെറുകഥകൾ സവിശേഷതകൾ കേരളീയനവോത്ഥാനം സാമൂഹ്യ രാഷ്ട്രീയ ഗതിവിഗതികൾ കേസരിയുടെ നേതൃത്വം നിയലിസം വിശദപഠനം

1. ദ്വാരക വേങ്ങയിൽ കുഞ്ഞിരാമൻനായർ
2. വെളുത്തകുഞ്ഞ് തകഴി
3. ജന്മദിനം ബഷീർ
4. ചോലമരങ്ങൾ സരസ്വതിയമ്മ



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മൊഡ്യൂൾ 2

ആധുനികത മൂല്യബോധം സാമൂഹ്യബോധം വ്യക്തിസങ്കല്പം എന്നിവയിലെ മാറ്റങ്ങൾ ഭാഷയിലും ഭാവുകത്വത്തിലും വന്ന പരിണാമങ്ങൾ ആഖ്യാനത്തിലെ പരീക്ഷണങ്ങൾ വിശദപഠനം

1. തരിശുനിലം മാധവിക്കുട്ടി
2. മഖൻസിങ്ങിന്റെ മരണം ടി. പത്മനാഭൻ
3. പെരുമഴയുടെ പിറ്റേന്ന് എം.ടി
4. രാധയുടെ കത്ത് ലളിതാംബിക അന്തർജ്ജനം

മൊഡ്യൂൾ 3

അത്യന്താധുനികത ഇതിവൃത്തത്തിലും കഥാപാത്രസങ്കല്പത്തിലും വന്ന മാറ്റം അസ്തിത്വദുഃഖം രാഷ്ട്രീയബോധങ്ങൾ ആഖ്യാനത്തിലെ പരീക്ഷണങ്ങൾ കറുത്തഹാസ്യം വിശദപഠനം

1. പ്രഭാതം മുതൽ പ്രഭാതം വരെ എം.മുകുന്ദൻ
2. മലമുകളിലെ അബ്ബുള്ള പുനത്തിൽ കുഞ്ഞബ്ബുള്ള
3. തേൻ സക്കറിയ
4. സ്നേഹത്തിന്റെ ശാലം ഒ.വി. വിജയൻ

മൊഡ്യൂൾ 4

കഥയിലെ ആധുനികാനന്തര സാഹിത്യ സമീപനങ്ങൾ ആഗോളീകരണം സാംസ്കാരികമായി നിവേശംആഖ്യാനത്തിലെ പുതുമകൾ ദളിത്, സ്ത്രീ, പാരിസ്ഥിതിക അവബോധങ്ങൾ വിശദപഠനം

1. നിലാവ് അറിയുന്നു സാനാ ജോസഫ്
2. പ്രേതഭാഷണം സി അയ്യപ്പൻ
3. ഇറച്ചി ടി.വി കൊച്ചുബാവ
4. മോദസ്ഥിതനായങ്ങു വസിപ്പു മലപ്പോലെ എസ് ഹരീഷ്



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ലൈബ്രറി റെക്കോർഡ് തയ്യാറാക്കാൻ താഴെ പറയുന്ന ഏതെങ്കിലും അഞ്ച് പുസ്തകം തിരഞ്ഞെടുക്കുക

1. പന്തിഭാജനം സന്തോഷ് എച്ചിക്കാനം
2. മൂന്ന് വിരലുകൾ ഇ. സന്തോഷ് കുമാർ
3. പച്ചയുടെ ആൽബം ധന്യാ രാജ്
4. ചാമുിക്കുഴി പി. വത്സല
5. ഓരോ എഴുത്തുകാരിയുടെ ഉള്ളിലും സാനാജോസഫ്
6. ഉടൽ ഒരു ചുഴ് നില മേതിൽ രാധാകൃഷ്ണൻ
7. ഉമ്പർട്ടോ എക്കോ ബി മുരളി
8. പരിസ്ഥിതിദർശനത്തിന്റേ പൂർവ്വമുഖം കെ എസ് രവീകുമാർ
9. കഥയും പരിസ്ഥിതിയും ജി. മധുസൂദനൻ
10. കഥ ആഖ്യാനവും അനുഭവസത്തയും കെ.പി അപ്പൻ സഹായകഗ്രന്ഥങ്ങൾ

1. ചെറുകഥ വാക്കും വഴിയും കെ എസ് രവീകുമാർ
2. കഥയുടെ ഭാവുകത്വപരിണാമം കെ എസ് രവീകുമാർ
3. സ്ത്രീ സ്വത്വം സമൂഹം (എഡി) ഇ വി രാമകൃഷ്ണൻ
4. ആധുനികാനന്തരം പി പി രവീന്ദ്രൻ
5. മലയാളത്തിലെ കഥാകാരികൾ {ശീദേവി കെ നായർ
6. ആധുനികതയുടെ കുറ്റ സമ്മതം പി പവിത്രൻ
7. കഥ തേടുന്ന കഥ എൻപ്രഭാകരൻ
8. സ്ത്രീവാദം ജെ. ദേവിക
9. കഥയും പരിസ്ഥിതിയും ജി. മധുസൂദനൻ
10. ചെറുകഥയുടെ ഛന്ദസ്സ് വി രാജകൃഷ്ണൻ
11. ഹരിതനിരൂപണം മലയാളത്തിൽ (എഡി) ജി. മധുസൂദനൻ
12. കഥയും പരിസ്ഥിതിയും ജി.മധുസൂദനൻ
13. അക്ഷരവും ആധുനികതയും ഇ വി രാമകൃഷ്ണൻ
14. കഥാന്തരങ്ങൾ പി കെ രാജശേഖരൻ
15. സമകാലിക മലയാള ചെറുകഥ വഴിയും പൊരുളും (എഡി) പി പി മാർക്കോസ്



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16. ചെറുകഥ ഇന്നലെ ഇന്ന് എം അച്ചുതൻ
17. മലയാള ചെറുകഥാസാഹിത്യം എം.എം ബഷീർ
18. കഥ ആഖ്യാനവും അനുഭവസത്തയും കെ പി അപ്പൻ
19. കഥാന്തരം വി ആർ സുധീഷ്
20. ചെറുകഥാപ്രസ്ഥാനം എം പി പോൾ
21. കഥ ആധുനികതയ്ക്കുശേഷം എം.കെ ഹരികുമാർ
22. എന്താണ് ആധുനികത എം മുക്തൻ
23. കഥയും ഫാൻറസിയും വത്സലൻവാതുശ്ശേരി
24. സ്ഥലം കാലം ചെറുകഥ സോമൻ നെല്ലിവിള

നവീന മലയാളകവിത

MAL3B03 നവീന മലയാളകവിത

ഉദ്ദേശ്യലക്ഷ്യങ്ങൾ

1. 1960 ഓടുകൂടി മലയാളകവിതയിൽ പ്രത്യക്ഷമായ നവീനതയെ ചരിത്രവീക്ഷണത്തോടെ മനസ്സിലാക്കുക
2. ആറുദശകങ്ങളോളം മലയാള കവിതയിലായ സൂക്ഷ്മവും സങ്കീർണ്ണവുമായ പരിണാമത്തെ മുൻനിർത്തി ആധുനികതാ പ്രസ്ഥാനത്തിന്റെ രാംഘട്ടത്തെ ഉൾക്കൊള്ളുക
3. ആധുനികാനന്തര മലയാള കവിതയിലെ രചനാ തന്ത്രങ്ങളും വിവിധ പ്രവണതകളും തിരിച്ചറിയുക
4. സ്ത്രീ, പരിസ്ഥിതി, ദലിത് കവിതകളുടെ കേരളീയ പരിസരത്തെ സംബന്ധിച്ച് ധാരണ നേടുക
5. മലയാളകവിതയിൽ സംഭവിച്ച മാറ്റങ്ങളെ വിമർശനബുദ്ധിയോടെ മനസ്സിലാക്കുക.



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മൊഡ്യൂൾ 1

മലയാളത്തിലെ നവീനപ്രവണതകളുടെ വേരുകൾ നഗരാനുഭവങ്ങളുടെ സങ്കീർണ്ണത അന്യ വർക്കരണവും അരക്ഷിതാവസ്ഥയും വ്യക്തിത്വത്തെ സംബന്ധിക്കുന്ന പുനർനിർവചനങ്ങൾ രൂപപരമായ പരീക്ഷണങ്ങൾ നാടോടി സംസ്കാരത്തിന്റെ സാധ്യതകളുടെ ഉപയോഗം വിശദപഠനം

1. മാഘവൻ അയ്യപ്പത്ത് ബസ്റ്റോപ്പിൽ
2. അയ്യപ്പപ്പണിക്കർ കാടവിടെ മക്കളേ
3. കടമ്മനിട്ട ശാന്ത

മൊഡ്യൂൾ 2

എഴുപതുകൾ രാഷ്ട്രീയവർക്കരിക്കപ്പെടുന്ന ആധുനികത വൈയക്തികതയിൽ നിന്ന് സാമൂഹികതയിലേക്കുചിക്ഷോഭകരമായ ഭാവങ്ങൾ ഒന്നിലും വിശ്വാസമില്ലായ്മ പ്രതികരണങ്ങളുടെ രൂക്ഷത. വിശദപഠനം

1. പോത്ത് കക്കാട്
2. ബംഗാൾ കെ.ജി ശങ്കരപ്പിള്ള
3. സംക്രമണം ആറ്റൂർ
4. പനി സച്ചിദാനന്ദൻ

മൊഡ്യൂൾ 3

പെൺമയുടെ ആവിഷ്കരണം കേരളീയപരിസരം താരാട്ടുപാട്ടുകൾ ഭക്തി കവിതകൾ തിരുവാതിരപ്പാട്ടുകൾ കടത്തനാട്ടുമാധവിയമ്മ കുട്ടിക്കുഞ്ഞു തങ്കച്ചി നവോത്ഥാന കാല്പനികുല ട്രം മാതൃത്വം പ്രണയം പ്രകൃതി ധർമ്മാധർമ്മം തുടങ്ങിയ പ്രമേയങ്ങൾ പ്രതിരോധം പെൺമയുടെ ഇടപെടലുകൾ വിശദപഠനം

1. ബാലാമണിയമ്മ കവിപ്രേയസി
2. സുഗതകുമാരി പെൺകുഞ്ഞ്
3. വിജയലക്ഷ്മി മൃഗശിക്ഷകൻ
4. വിജില ചിറപ്പാട് അടുക്കളയില്ലാത്ത വീട്



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മൊഡ്യൂൾ 4

കവിതയുടെ വർത്തമാനം ദലിത്, സ്ത്രീ, പാരിസ്ഥിതിക രാഷ്ട്രീയത്തിന്റെ പിൻബലത്തിൽ വികസിക്കുന്ന സൗന്ദര്യശാസ്ത്രം നവമാധ്യമങ്ങളിലെ ആവിഷ്കാരങ്ങൾ.

വിശദപഠനം

അത്താഴം എ. അയ്യപ്പൻ

2. കൊട്ട എസ്. ജോസഫ്
3. പന്തുകായ്ക്കുംമരം മോഹനകൃഷ്ണൻ കാലടി
4. കനം പി. രാമൻ
5. നഷ്ടം കെ. ആർ ടോണി
6. മാർത്തോമ്മ നഗറിലെ പ്രതിമകൾ പി.എ നാസിമുദ്ദീൻ
7. ആനമയിലൊട്ടകം റഫീക്ക് അഹമ്മദ്
8. കൂട്ടാന്തയുടെ എഴുപതുവർഷങ്ങൾ എം.ബി മനോജ്

ലൈബ്രറി റെക്കോർഡിലേക്ക് (ഏതെങ്കിലും 5 എണ്ണം)

1. മലയാള സാഹിത്യത്തിലെ കീഴാളപരിപ്രേഷ്യം അനിൽ കുമാർ ടി.കെ
2. വയലറ്റുനാവിലെ പാട്ടുകൾ ഡോ.ജി ഉഷാകുമാരി
3. ഉത്തരാധുനികത കവിതാ പഠനങ്ങൾ പോൾ എം.എസ്
4. മലയാള കവിത ആധുനികാനന്തരം സി. ആർ പ്രസാദ്
5. കവിതയിലെ പുതുവഴികൾ നെല്ലിക്കൽ മുരളീധരൻ
6. ആധുനിക മലയാള കവിതയിലെ സ്ത്രീപക്ഷ സമീപനങ്ങൾ ഗീത
7. പുതുകവിത പുതുമയും പലമയും ഡോ.മിനി ആലീസ് (എഡി)
8. മൗനത്തിന്റെ മുഴക്കങ്ങൾ എൻ. ശശിധരൻ
9. ആധുനികത മലയാള കവിതയിൽ ഡോ. എൻഅജയകുമാർ
10. അയ്യപ്പപ്പണിക്കരുടെ ലേഖനങ്ങൾ (195080) ഹരന്ദ്രോമുകതമായ കാവ്യരൂപശില്പം

കെ അയ്യപ്പപ്പണിക്കർ സഹായകഗ്രന്ഥങ്ങൾ

1. കവിതയുടെ നൂറ്റ് ഒന്നാം ഭാഗം എം.എൻവിജയൻ



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2. കവിതയുടെ നൂറ്റ് രാഘം ഭാഗം എം.എൻ വിജയൻ
3. 100 വർഷം 100 കവിത പി.കെ രാജശേഖരൻ (എഡി)
4. മലയാളകവിത ആധുനികതയും പാരമ്പര്യവും എം.ആർരാഘവവാര്യർ
5. ആധുനികതയുടെ കുറ്റസമ്മതം പി. പവിത്രൻ
ആധുനികത സാഹിത്യദർശനങ്ങൾ ഡോ. കെ.എം തരകൻ
7. സമാകലനം എൻ.വി കൃഷ്ണവാര്യർ
8. ആധുനിക കവിതയിലെ കലിയും ചിരിയും പ്രസന്നരാജൻ
9. തീവി ഒരു ദേശീയ മൃഗം ഉമർ തറമേൽ
10. കേരളകവിത (2010) (എ.ഡി) സച്ചിദാനന്ദൻ
11. കേരളകവിത (2013) (എ.ഡി) സച്ചിദാനന്ദൻ
12. പുതുകവിത ാപനങ്ങൾ മലയാളം റിസേർച്ച് ജേണൽ 2005 13.
സാഹിത്യചരിത്രങ്ങളിലെ പ്രസക്തഭാഗങ്ങൾ

ദൃശ്യകലാസാഹിത്യം

MAL3B04 ദൃശ്യകലാസാഹിത്യം

ഉദ്ദേശ്യലക്ഷ്യങ്ങൾ

1. മലയാള നാടകത്തെക്കുറിച്ചുള്ള ചരിത്രബോധം ആർജ്ജിക്കുക
2. കേരളത്തിന്റെ സാമൂഹിക, സാംസ്കാരിക, രാഷ്ട്രീയ ചരിത്രത്തിൽ നാടകം ചെലുത്തിയ സ്വാധീനം ബോധ്യപ്പെടുന്നതിന്
3. നാടകം എന്നകലാരൂപത്തിന്റെ ഘടനാതലത്തിലും ആവിഷ്കാരതലത്തിലും ഉള്ള സവിശേഷതകൾ തിരിച്ചറിയുന്നതിന്



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4. നാടകസങ്കേതങ്ങളെക്കുറിച്ച് സാമാന്യമായ ധാരണ ലഭിക്കുന്നതിന് (രംഗഭാഷ, ശരീരഭാഷ, സാഹിത്യഭാഷ, ശബ്ദനിയന്ത്രണം, വെളിച്ചക്രമീകരണം, ചലനം, അലങ്കാരങ്ങൾ, ഉപകരണങ്ങൾ, ആശയവിനിമയ തന്ത്രങ്ങൾ)
5. കേരളീയരംഗകലകളുടെ പരിണാമവും ചരിത്രവും സാമാന്യമായി പരിചയപ്പെടുക
6. ജനകീയ ദൃശ്യസംസ്കാരത്തെ കാലാനുസൃതമായി പലതലങ്ങളിലായി ഭാഷ്യപ്പെടുത്തിയ കലാരൂപങ്ങളെന്നനിലയിൽ നാടകത്തെയും സിനിമയേയും മനസ്സിലാക്കുന്നതിന്
7. നാടകവും കഥകളിയും ചലച്ചിത്രവും കാണാനും പഠിക്കാനും അവതരിപ്പിക്കാനും ആസ്വാദനകൂട്ടായ്മകൾ സംഘടിപ്പിക്കുന്നതിനും പ്രേരണയും പ്രചോദനവും നേടുന്നതിന്
8. ഭാരതീയവും ദേശീയവുമായ നാട്യസങ്കല്പങ്ങൾക്കതീതമായി ഒരു നാട്യപാരമ്പര്യം കേരളം എങ്ങനെ സ്വായത്തമാക്കി എന്ന് തിരിച്ചറിയുന്നതിന്

നാടോടി അനുഷ്ഠാനകലകൾ മുതൽ ശൈലീനിഷ്ഠകലകൾ വരെയുള്ള കലകളെയും പാശ്ചാത്യ സ്വാധീനത്തിലൂടെ സ്വന്തമായി രൂപം കൊടുത്ത കലകളേയും പരിചയപ്പെടുക

10. രംഗപാഠത്തെക്കുടിബന്ധപ്പെടുത്തിക്കൊണ്ട് ദൃശ്യ സാഹിത്യരൂപങ്ങളുടെ പഠനം നിർവ്വഹിക്കാൻ പ്രാപ്തനാവുക
 11. ജനകീയവും ജനപ്രിയവുമായ ആധുനിക കലകളുടെ സംസ്കാര പരിസരം തിരിച്ചറിയുക മൊഡ്യൂൾ 1
- ദശരൂപകങ്ങൾ കൂടിയാട്ടം നാടോടിനാടകം പൊറാട്ട് കാക്കാരിശ്ശിമുടിയേറ്റ് നാടൻ കലകൾ ക്ലാസിക്കൽ കലകൾ രംഗോപകരണങ്ങൾ ഗീതം, വാദ്യം, നൃത്തം അഭിനയം തനതുനാടക വേദി നാട്യധർമ്മി ലോകധർമ്മി മുഖത്തെഴുത്തുപുസ്തകവിധാനം.
- വിശദപഠനം

1. മലയാള ശാകുന്തളം (1,2 അങ്കങ്ങൾ) ഏ.ആർ രാജരാജവർമ്മ
2. **അവനവൻകടമ്പ കാവാലം**
മൊഡ്യൂൾ 2



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സംഗീതനാടകം പ്രഹസനം പ്രൊഫഷണൽ അഥ് ചർ വിഭജനം തൈരുവുനാടകം സ്ത്രീ നാടകം കുട്ടികളുടെ നാടകവേദി വിശദപഠനം

1. സർവ്വേക്കല്ല് തോപ്പിൽ ഭാസി
2. പെരുമ്പറ പി. എം. താജ്
3. ഓരോരോ കാലത്തിലും ശ്രീജ കെവി

മൊഡ്യൂൾ 3

കഥകളി ചരിത്രം ഘടന ആട്ടക്കഥ ചരിത്രം പദം ശ്ലോകം ദണ്ഡകം സാമാന്യ ധാരണ. വിശദപഠനം

1. നളചരിതം രാം ദിവസം ഉണ്ണായിവാര്യർ
- മൊഡ്യൂൾ 4

സിനിമ സാമാന്യ ചരിത്രം സിനിമ ഒരു സങ്കരകല മലയാള സിനിമയുടെ വികാസംതിരക്കഥ സാഹിത്യവും സിനിമയും വിശദപഠനം

1. ആദാമിന്റെ മകൻ അബു (തിരക്കഥ) സലീം അഹമ്മദ്
- ലൈബ്രറി റെക്കോർഡിലേക്ക് (ഏതെങ്കിലും 5 എണ്ണം)

1. കന്യക എൻ. കുഷ്ണപ്പിള്ള
2. പാട്ടബാക്കി കെ. ദാമോദരൻ

അഗ്നിസാക്ഷി ശ്യാമപ്രസാദ്

4. അടുകളയിൽ നിന്നും അരങ്ങത്തേക്ക് വി.ടി ഭട്ടതിരിപ്പാട്
5. ലങ്കാലക്ഷ്മി സി.എൻ ശ്രീകണ്ഠനായർ
6. ഉയരുന്ന യവനിക സി.ജെ തോമസ്
7. അരങ്ങിലെ അനുഭവങ്ങൾ കെ. പി. എസ്. സി സുലോചന
8. മലയാള സിനിമയും സാഹിത്യവും മധു ഇറവങ്കര
9. നാടക ദർശനം ജി. ശങ്കരപ്പിള്ള
10. കഥകളി ജി. കുഷ്ണപ്പിള്ള

സഹായകഗ്രന്ഥങ്ങൾ

1. കഥകളി വിജ്ഞാനകോശം അയ്യനം കുഷ്ണക്കൈമൾ



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2. ആട്ടക്കമാസാഹിത്യചരിത്രം അയ്യനം കൃഷ്ണക്കൈമൾ
3. സിനിമയുടെ ലോകം അടൂർ ഗോപാലകൃഷ്ണൻ
4. മലയാളനാടക സാഹിത്യചരിത്രം ജി. ശങ്കരക്കുറുപ്പ്
5. മലയാളനാടക പ്രസ്ഥാനം കാട്ടുമാടം നാരായണൻ
6. മലയാളനാടകവേദിയുടെ കഥ മടവൂർ ഭാസി
7. പ്രേക്ഷകരുടെ അരങ്ങ് എൻ. ആർ ഗ്രാമപ്രകാശ്
8. കറുത്തചിരിയുടെ അരങ്ങ് എൽ തോമസ്കുട്ടി
9. മലയാള സംഗീത നാടക ചരിത്രം കെ ശ്രീകുമാർ
10. കാക്കാരിശ്ശി നാടകം ജി. ഭാർഗവൻപിള്ള
11. നാട്ടരങ്ങ് വികാസവും പരിണാമവും ജി. ഭാർഗവൻപിള്ള
12. കൂടിയാട്ടം അഭിനയത്തിന്റെ തുടർച്ചയും വളർച്ചയും കെ.ജി പൗലോസ്
13. കേരളത്തിലെ നാടോടി നാടകങ്ങൾ എസ്.കെ നായർ
14. സംവിധായകസങ്കല്പം ജി. ശങ്കരപ്പിള്ള
15. മലയാള സ്ത്രീ നാടക ചരിത്രം സജിത മഠത്തിൽ
16. നാടകപ്രവേശിക എ.ഡി ഹരിശർമ്മ
17. സിനിമയും സംസ്കാരവും ഗോപിനാഥൻ കെ
18. സിനിമ ഒരു വിസ്മയ കല പ്രൊഫ. ജോൺ ശങ്കരമംഗലം
19. സിനിമയും പ്രത്യയശാസ്ത്രവും വി.കെ ജോസഫ്
20. കഥയും തിരക്കഥയും ആർ.വി.എം ദിവാകരൻ
21. മലയാളതിരക്കഥ വളർച്ചയും വർത്തമാനവും ആർ.വി.എം ദിവാകരൻ
22. മലയാള സിനിമ 1928-2006 ബാലചന്ദ്രൻ പെരുനാനി
23. തിരക്കഥാസാഹിത്യം സൗന്ദര്യവും പ്രസക്തിയും ജോസ്.കെ മാനുവൽ
24. ചരിത്രവും ചലച്ചിത്രവും ദേശഭാവനയുടെ ഹർഷമൂല്യങ്ങൾ പി. എസ് രാധാകൃഷ്ണൻ
25. ആധുനിക മലയാള സിനിമ കെ.വി രാമൻകുട്ടി
26. മലയാള സിനിമാപഠനങ്ങൾ സി. എസ് വെങ്കിടേശ്വരൻ
27. ഉടലിന്റെ താരസ്വരൂപങ്ങൾ സി.എസ് വെങ്കിടേശ്വരൻ



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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പ്രാചീന, മധ്യകാല മലയാളകവിത

MAL4B05 പ്രാചീന, മധ്യകാല മലയാളകവിത

മൊഡ്യൂൾ 1

പ്രാചീന പാട്ടുസാഹിത്യം പാട്ടിന്റെ ലക്ഷണം പാട്ടും പാണ്ഡ്യഭാഷാസാരപുവും പാട്ടിന്റെ വികാസപരിണാമങ്ങൾ രാമചരിതം തിരുനിഴൽമാല പാട്ടിന്റെ പുതിയമുഖം കണ്ണശ്ശകൃതികൾ രാമ കഥാപാട്ട് വിശദപഠനം

1. രാമചരിതം പടലം 1
2. കണ്ണശ്ശരാമായണം സുന്ദരകാണ്ഡം (ആദ്യത്തെ 15 പാട്ടുകൾ)

മൊഡ്യൂൾ 2

മണിപ്രവാള സാഹിത്യം മണിപ്രവാള ഭാഷ ലീലാ തിലകനിർവചനം സന്ദേശ കാവ്യങ്ങൾ മധ്യ കാല ചമ്പുക്കൾ പില്ക്കാല മലയാളഭാഷയിൽ മണിപ്രവാളം ചെലുത്തിയ സ്വാധീനം

വിശദപഠനം

1. ഉണ്ണുനീലി സന്ദേശം പ്രസ്താവന ഒഴിവാക്കി ആദ്യത്തെ 10 ശ്ലോകങ്ങൾ
2. ഭാഷാനൈഷധം ചമ്പു പൂർവ്വഭാഗം ആദ്യത്തെ 30 ശ്ലോകങ്ങൾ

മൊഡ്യൂൾ 3

ഗാഥ, കിളിപ്പാട്ട്, തുള്ളൽ, വഞ്ചിപ്പാട്ട്, പാന എന്നീ സാഹിത്യപ്രസ്ഥാനങ്ങളുടെ സവിശേഷതകൾ ഭക്തിയുടെ പരിണാമം ചെറുശ്ശേരി മുതൽ പൂന്താനം വരെ എഴുത്തച്ഛൻ ഭാഷയിൽ വരുത്തിയ മൗലിക പരിവർത്തനം

വിശദപഠനം

1. കൃഷ്ണഗാഥ അക്രൂരാഗമനം
2. മഹാഭാരതം കിളിപ്പാട്ട് സ്ത്രീപർവ്വം
3. ഘോഷയാത്ര തുള്ളൽ
4. കുചേലവൃത്തം വഞ്ചിപ്പാട്ട് രാമപുരത്തുവാദ്യർ (കൃഷ്ണ കുചേല സംഗമം മാത്രം)



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മൊഡ്യൂൾ 4

നാടോടി സംസ്കാരത്തെ പ്രതിഫലിപ്പിക്കുന്ന പാട്ടുകൾ, നാടോടി ഗാനങ്ങൾ ഭാഷാപരവും സാംസ്കാരികവുമായ പ്രത്യേകതകൾ വാമൊഴി സാഹിത്യം നിർവചനങ്ങൾ, ഘടന, പ്രമേയം, വീര കഥാഗാനങ്ങൾ വടക്കൻ, തെക്കൻ, ഇടനാടൻ പാട്ടുകൾ തൊഴിൽ പാട്ടുകൾ കൃഷിപ്പാട്ടുകൾ വള്ള പാട്ടുകൾ നാവേറുപാട്ടുകൾ സാമൂഹിക ഗാനങ്ങൾ ജൂത ക്രിസ്ത്യൻ മാപ്പിളപ്പാട്ടുകൾ എന്നിവയുടെ സാമാന്യപഠനം വിശദപഠനം

1. **തോറ്റംപാട്ട് പൊട്ടൻതെയ്യം**
2. ബദറുൽമുനീർ ഹുസ്സുൽ ജമാൽ (മികവുറ്റ ബദറുൽ മുനീറിനെത്തന്നെ.....
.....തുടങ്ങിയ 32 വരികൾ)

3. ഇരവിക്കുട്ടിപ്പിള്ളപ്പാട്ട് (ഇരവിയുടെ പടപ്പുറപ്പാടുമാത്രം) ലൈബ്രറി റെക്കോർഡിലേക്ക് (ഏതെങ്കിലും 5 എണ്ണം മാത്രം)

1. വടക്കൻ പാട്ടുകൾ (എഡി) രാഘവൻ പയ്യനാട്
2. വടക്കൻപാട്ടുകളുടെ പണിയാല എം.ആർരാഘവവാരിയർ
3. കൃഷ്ണഗാഥാ പഠനങ്ങൾ ടി. ഭാസ്കരൻ
4. കുഞ്ചൻ നമ്പ്യാർ വാക്കും സമൂഹവും കെ.എൻ ഗണേഷ്
5. എഴുത്തച്ഛൻ്റെ കല പി.കെ ബാലകൃഷ്ണൻ
6. തുഞ്ചൻ പ്രബന്ധങ്ങൾ കേരള സാഹിത്യഅക്കാദമി
7. സന്ദേശത്തിൻ്റെ സംസ്കാരപാഠങ്ങൾ (സംസ്കാരം, പഠനം, ചരിത്രം, സിദ്ധാന്തം, പ്രയോഗം) ദിലീപ്പുമാർ കെ.വി
8. ശ്രീ. നിരണം കവികൾ വിദ്വാൻ ശ്രീ.വി കൃഷ്ണൻനമ്പൂതിരി
9. പുന്താനത്തിൻ്റെ ഭക്തിയും തത്ത്വചിന്തയും ഡോ. പി ഉഷ
10. അറബിമലയാള സാഹിത്യപഠനങ്ങൾ ടി. മൻസൂറലി (എഡി) സഹായകഗ്രന്ഥങ്ങൾ



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1. സാഹിത്യചരിത്രങ്ങളിലെ പ്രസക്തഭാഗങ്ങൾ (ഡോ.കെ.എം.ജോർജ്ജ്, ഉള്ളൂർ, ടി.എം ചുമ്മാർ, എൻ. കൃഷ്ണപിള്ള, പി.കെ പരമേശ്വരൻ നായർ)
2. എൻ. മുക്തൻ ഗാഥ
3. എൻ.മുക്തൻ കിളിപ്പാട്ട്
4. എം.ആർ രാഘവവാര്യർ കേരളീയത ചരിത്രമാനങ്ങൾ
5. എം.ആർ രാഘവവാര്യർ അമ്മവഴിക്കേരളം
6. ഉള്ളൂർ ഭാഷാ ചമ്പുക്കൾ
7. ഡോ. ചേലനാട്ട് അച്യുതമേനോൻ എഴുത്തച്ഛനും കാലവും
8. ഡോ. പി.കെ നാരായണപ്പിള്ള പദ്യരത്നം
9. വി. ആന്റണി (എഡി) തച്ചോളിപാട്ടുകൾ
10. പി.വിജയപ്പൻ പാഠവും പഠനവും
11. കെ.എൻ എഴുത്തച്ഛൻ തെരഞ്ഞെടുത്ത പ്രബന്ധങ്ങൾ
12. ഇളംകുളം കുഞ്ഞൻപിള്ള കേരളഭാഷയുടെ വികാസപരിണാമങ്ങൾ
13. പുതുശ്ശേരി രാമചന്ദ്രൻ കേരളചരിത്രത്തിന്റെ അടിസ്ഥാന രേഖകൾ
14. പി.കെ സുമതിക്കുട്ടി നമ്പ്യാർ തമിഴ്
15. സോമശേഖരൻ കേരളപ്പഴമ ഒരു ചരിത്രസഞ്ചാരം
16. രാഘവൻ പയ്യനാട് ഫോക്ലോർ
17. രാഘവൻ പയ്യനാട് ഫോക്ലോറിനൊരു പഠനപദ്ധതി
18. കെ.രത്നമ്മ മലയാള ഭാഷാചരിത്രം എഴുത്തച്ഛൻ വരെ

മലയാള നോവൽ സാഹിത്യം

MAL4B06 മലയാള നോവൽ സാഹിത്യം



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നോവൽ നിർവചനം, ഉദ്ഭവം പ്രാരംഭഘട്ടം പൂർവ്വ മാതൃകകൾ പാശ്ചാത്യ സ്വാധീനം കൊളോണിയൽ ആധുനികത ദേശീയത സാമൂഹിക, ചരിത്രനോവലുകൾ നോവലിസ്റ്റുകൾ വിശദപഠനം

1. ഇന്ദുലേഖ ഒ. ചന്തുമേനോൻ
2. മാർത്താണ്ഡവർമ്മ സി.വി രാമൻപിള്ള

മൊഡ്യൂൾ 2

നവോത്ഥാനഘട്ടം സാമൂഹിക സാമ്പത്തിക പ്രശ്നങ്ങൾ നോവലിൽ പുരോഗമനസാഹിത്യത്തിന്റെ ആവിർഭാവവും സ്വാധീനവും സാധാരണക്കാരുടെയും അടിസ്ഥാന വർഗത്തിന്റെയും ജീവിതം ദേശീയ പ്രസ്ഥാനം സ്വാതന്ത്ര്യസമരം ഇന്ത്യാവിഭജനം ഐക്യകേരളം ജനപ്രിയ നോവൽ വിശദപഠനം

1. ഭ്രാന്താലയം കേശവദേവ്
2. ഉമ്മാച്ചു ഉറുബ്
3. ബാല്യകാലസഖി ബഷീർ

മൊഡ്യൂൾ 3

ആധുനികത ചരിത്രം സാമൂഹികത വൈയക്തികത കഥാപാത്ര സങ്കല്പം മൂല്യബോധം ഭാഷയിലും ആഖ്യാനത്തിലും വന്ന മാറ്റങ്ങൾ സംഘർഷങ്ങൾ വിശദപഠനം

1. അഗ്നിസാക്ഷി ലളിതാംബിക അന്തർജ്ജനം
2. ഖസാക്കിന്റെ ഇതിഹാസം ഒ വി വിജയൻ

മൊഡ്യൂൾ 4

ആധുനികാനന്തര സ്വത്വരാഷ്ട്രീയം കീഴാളത, ദേശീയത, സ്ത്രീ, പരിസ്ഥിതി, ആഗോളീകരണം പ്രതിസന്ധികൾ പ്രാദേശികതയും പ്രതിരോധവും ആഖ്യാനപരിണാമങ്ങൾ

വിശദപഠനം

1. പുലയപ്പാട്ട് മുകുന്ദൻ
2. കൊച്ചരേത്തി നാരായൻ



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ലൈബ്രറി റെക്കോർഡ് തയ്യാറാക്കാൻ താഴെ പറയുന്ന ഏതെങ്കിലും അഞ്ചെണ്ണം തിരഞ്ഞെടുക്കുക

1. ഇന്റുലേഖയും ഇംഗ്ലീഷും പി.കെ ബാലകൃഷ്ണൻ
2. ആവർത്തനം വി സി ശ്രീജൻ
3. ചാക്യാരുടെ കൊലച്ചിരി പി.കെ രാജശേഖരൻ (വി.കെ.എൻ പഠനങ്ങൾ)
4. ആലാഹയുടെ പെൺമക്കൾ സാനാ ജോസഫ്
5. നെല്ല് പി.വത്സല
6. നാലുകെട്ട് എം.ടി
7. സാക്ഷി കാക്കനാടൻ
8. ആരാച്ചാർ കെ ആർ മീര
9. ജൈവം പി സുരേന്ദ്രൻ
10. ഗോവർദ്ധന്റെ യാത്രകൾ ആനന്ദ്

സഹായകഗ്രന്ഥങ്ങൾ

1. നോവൽ സാഹിത്യം എം.പി പോൾ
2. മലയാള നോവൽ സാഹിത്യ ചരിത്രം കെ.എം. തരകൻ
3. ആദ്യകാല മലയാള നോവൽ ജോർജ്ജ് ഇരുമ്പയം
4. ചരിത്രനോവൽ മലയാളത്തിൽ കൽപറ്റ നാരായണൻ
5. പ്രതിപാത്രം ഭാഷണഭേതം എൻകൃഷ്ണപിള്ള
6. അന്ധനായ ദൈവം പി.കെ രാജശേഖരൻ
7. മാറുന്ന മലയാള നോവൽ കെ.പി അപ്പൻ
8. നോവൽ സിദ്ധിയും സാധനയും പി.കെ ബാലകൃഷ്ണൻ
9. ആധുനിക നോവൽ ദർശനങ്ങൾ കെ.എം തരകൻ
10. ഇരുപതു നോവലുകൾ എം.എം ബഷീർ
11. നോവൽ പ്രശ്നങ്ങളും പഠനങ്ങളും എം അച്ചുതൻ
12. ആധുനികത മലയാള നോവലിൽ അഗസ്റ്റിൻ ജോസഫ്
13. ഏകാന്തനഗരങ്ങൾ പി.കെ രാജശേഖരൻ
14. സി.വി ചരിത്രാഖ്യായികകളിലൂടെ എം.കെ കൃഷ്ണൻ
15. നോവലും രാഷ്ട്രീയവും എ.എം വാസുദേവൻപിള്ള
16. നോവൽ നമ്മുടെയും അവരുടെയും ജി.എൻ പണിക്കർ



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

മലയാളവ്യാകരണം

MAL5B07മലയാളവ്യാകരണം

മൊഡ്യൂൾ 1

1. വ്യാകരണം, വ്യാകരണപഠനത്തിന്റെ പ്രസക്തി, മലയാളത്തിലെ പ്രധാന വ്യാകരണ ഗ്രന്ഥങ്ങൾ സാമാന്യപരിചയം
2. അക്ഷരവർണ്ണം ലിപി, മലയാളത്തിലെ അക്ഷരങ്ങൾ ഭിന്നാഭിപ്രായങ്ങൾസംവൃതോകാരം, വത്സ്യവർഗം
3. സന്ധി കേരളപാണിനിയുടെ വിഭജനം ലീലാതിലകത്തിലെ സന്ധിസൂത്രങ്ങളുമായുള്ള താര തമ്യം, സന്ധികാര്യങ്ങളിലെ പ്രായോഗിക പരിജ്ഞാനം
4. വർണ്ണവികാരങ്ങൾ, മലയാളത്തിലെ പ്രധാന വർണ്ണവികാരങ്ങൾ ഏ.ആറിന്റെ അഭിപ്രായം മൊഡ്യൂൾ 2

1. ശബ്ദവിഭാഗം നിർവചനം വിഭജനം പ്രകൃതി പ്രത്യയം ഇടനില
2. കേരളപാണിനിയുടെ പദവിഭജനം വിമർശനാത്മകപഠനം, ഇതര പണ്ഡിതന്മാരുടെ അഭിപ്രായങ്ങൾ
3. നാമം, കൃതി, ഭേദകം നിർവചനം, വിഭജനം, ഉപവിഭാഗങ്ങൾ വിമർശനം
4. ദ്രോതകംരാജരാജവർമ്മയുടെ അഭിപ്രായം വിമർശനം/വിശകലനം

മൊഡ്യൂൾ 3

1. നാമങ്ങളുടെ വിഭജനം, വിഭജനാടിസ്ഥാനം, കേരളപാണിനിയുടെ അഭിപ്രായം
2. ലിംഗം, ലിംഗനിർണ്ണയത്തിലെ സങ്കീർണതകൾ, പ്രത്യയങ്ങൾ
3. വിഭജനം, വിഭക്തി, കാരകം, വിഭക്ത്യാഭാസം
4. നിഷ്പന്ന നാമങ്ങൾ തദ്ധിതം, തദ്ധിതത്തിന്റെ പ്രയോഗസാധ്യതകൾ

മൊഡ്യൂൾ 4

1. ക്രിയ ക്രിയാവിഭജനം, വിഭജനത്തിന്റെ ഉപാധികൾ



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2. കാലം പ്രത്യയങ്ങൾ, വിതരണത്തിലെ സങ്കീർണതകൾ, വർത്തമാനകാലപ്രത്യയം, നിഗീർണ്ണ കർത്യകം, അനുനാസികസംസർഗ്ഗം, ദ്വിത്വ ഖരാദേശം

3. പ്രകാരം, പ്രയോഗം, നാമധാതു, വിലധാതു, അനുപ്രയോഗം, സമാസം, നിഷേധം, പേരെച്ചം, വിനയെച്ചം, കൃത്ത് കൃതികൃത്ത്, കാരകകൃത്ത്

4. വാക്യം ചുർണ്ണിക, സങ്കീർണ്ണവാക്യം, അംഗവാക്യം, അംഗിവാക്യം, നിഷേധവാക്യം, ഭാഷ യിലെ ചിഹ്നങ്ങൾ, ലിഖിതഭാഷയിൽ അവയുടെ പ്രാധാന്യം

സഹായകഗ്രന്ഥങ്ങൾ

1. കേരളപാണിനീയം എ.ആർ രാജരാജവർമ്മ
2. സാഹിത്യസാഹ്യം എ.ആർ രാജരാജവർമ്മ
3. ശബ്ദശോധിനി എ.ആർ രാജരാജവർമ്മ
4. മലയാളഭാഷാവ്യാകരണം ഹെർമൻ ഗുർട്ട്
5. മലയാളയുടെ വ്യാകരണം ജോർജ് മാത്തൻ
6. കേരളഭാഷാവ്യാകരണം പാച്ചുമുത്തത്ത്
7. വ്യാകരണമിത്രം എം ശേഷഗിരി പ്രഭു
8. കേരളപാണിനീയ പാഠങ്ങൾ സി. വി വാസുദേവഭട്ടതിരി
9. കേരളപാണിനീയഭാഷ്യം സി. എൽ ആന്റണി
10. കൈരളീശബ്ദാനുശാസനം കെ. സുകുമാരപിള്ള
11. മലയാളവ്യാകരണസമീക്ഷ കെ. എം പ്രഭാകരവാർയർ
12. മൊഴിയും പൊരുളും കെ. എം പ്രഭാകരവാർയർ
13. പൂർവ്വകേരളഭാഷ കെ. എം പ്രഭാകരവാർയർ
14. വ്യാകരണപഠനങ്ങൾ ടി.ബി വേണുഗോപാലപ്പണിക്കർ
15. ഭാഷാപരിചയം കുട്ടികൃഷ്ണമാരാർ
16. മലയാളവ്യാകരണം സംവാദങ്ങൾ സമന്വയങ്ങൾ ഉണ്ണി ആമപ്പാറയ്ക്കൽ
17. മലയാളവ്യാകരണചിന്ത ഉണ്ണി ആമപ്പാറയ്ക്കൽ



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പാശ്ചാത്യസാഹിത്യ സിദ്ധാന്തങ്ങൾ

MAL5B08 പാശ്ചാത്യസാഹിത്യ സിദ്ധാന്തങ്ങൾ

മൊഡ്യൂൾ 1

പാശ്ചാത്യ സാഹിത്യ സിദ്ധാന്തങ്ങളുടെ ഉത്ഭവം പ്ലേറ്റോ അനുകരണവാദം റിപ്പബ്ലിക്ക് കലാകാരന്മാരെക്കുറിച്ച് പ്ലേറ്റോ പ്ലേറ്റോയുടെ പ്രാധാന്യം അരിസ്റ്റോട്ടിൽ സിദ്ധാന്തങ്ങൾ അനുകരണ സിദ്ധാന്തം ട്രാജഡി നിർവ്വചനം ആറു ഘടകങ്ങൾ കതാർസിസ് ലോംഗിനസ് ഉദാത്തവാദം

മൊഡ്യൂൾ 2

വേർഡ്സ്വർത്ത് ലിറിക്കൽ ബലാഡ്സിന്റെ ആമുഖം കാവ്യനിർവ്വചനം ഭാവനയുടെ പ്രാധാന്യം കാവ്യഭാഷ കോൾ റിഡ് കവിപ്രതിഭ ഇമാജിനേഷൻ ഫാൻറസി ടോൾസ്റ്റോയ് വിമർശന സമീപനം

മൊഡ്യൂൾ 3

റിയലിസം മിസ്റ്റിസിസം സർറിയലിസം ഫ്യൂച്ചറിസം എക്സ്പ്രഷനിസം എക്സ്റ്റൻഷ്യലിസം എന്നിവയെക്കുറിച്ചുള്ള സാമാന്യ ധാരണ

മൊഡ്യൂൾ 4

ആധുനികാനന്തര വിമർശന സിദ്ധാന്തങ്ങൾ ഘടനാവാദം ഉത്തരഘടനാവാദം ശൈലി വിജ്ഞാനീയം മനശാസ്ത്രസമീപനം അപനിർമാണം

സഹായകഗ്രന്ഥങ്ങൾ

1. പാശ്ചാത്യസാഹിത്യ തത്വശാസ്ത്രം കെ.എം തരകൻ
2. പാശ്ചാത്യസാഹിത്യ ദർശനം പ്രൊഫ. എം അച്യുതൻ
3. ആധുനികോത്തരയുടെ കേരളീയ പരിസരം ഡോ. പി.കെ പോക്കർ
2. ഉത്തരാധുനികത സി.ബി സുധാകരൻ
5. ഉത്തരാധുനികത വർത്തമാനവും വംശാവലിയും കെ.പി അപ്പൻ
6. അി ക്വിറ്റോറിയോയുടെ റീം വേല ട്രാജഡി റീട്ട് ഘശല്യേമുഖ്യേല റ്റേ.ഒ ഒറീം
7. ജ്യൂശിരശുഹല റീട്ട് ഘശല്യേമുഖ്യേല ഇശശരശാം ക.അ ശശരവമുറെ



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മലയാള സാഹിത്യവിമർശനം

MAL5B09 മലയാള സാഹിത്യവിമർശനം

മൊഡ്യൂൾ 1

കേരളവർമ്മ വലിയകോയിതമ്പുരാൻ ഭാഷാ സാഹിത്യവികാസത്തെപ്പറ്റി അവതാരികകളും നിരൂപണങ്ങളും പുസ്തകാഭിപ്രായങ്ങളും പ്രാസവാദം സി.പി.അച്യുതമേനോൻ ഏ.ആർ രാജരാജ വർമ്മ സാഹിത്യപഞ്ചാനൻപി.കെ നാരായണപിള്ള വിശദപഠനം

1. പ്രാസവാദം ഡോ. വി ജയ പ്രസാദ്(അധ്യായം ൪, സാഹിത്യവിവാദങ്ങളിലൂടെ, ലിപി പബ്ലിക്കേഷൻസ്, കോഴിക്കോട്)
2. നളിനിയുടെ അവതാരിക ഏ.ആർരാജരാജവർമ്മ
3. മാർത്താണ്ഡവർമ്മ സി.പി അച്യുതമേനോൻ (സി.പി അച്യുതമേനോന്റെ നിരൂപണങ്ങൾ)

മൊഡ്യൂൾ 2

സാഹിത്യവിമർശനത്തിലെ ദിശാ വ്യതിയാനം കേസരി ി.ഏ.ബാലകൃഷ്ണപിള്ള കുട്ടികൃഷ്ണ രാർ എം.പി പോൾ മുശ്ശേരി വിശദപഠനം

1. നിഷ്കഷനിരൂപണം കുട്ടികൃഷ്ണമാരാർ
2. സമൂഹത്തിലെ വിഷം കേസരി ഏ.ബാലകൃഷ്ണപിള്ള(നവലോകം)
3. ബാല്യകാലസഖി അവതാരിക എം.പി പോൾ

മൊഡ്യൂൾ 3

ജീവത്സാഹിത്യം പുരോഗമന സാഹിത്യപ്രസ്ഥാനം അക്കാദമിക വിമർശനം മനുഷ്യാസ്ത്ര വിമർശനം വിശദപഠനം

1. ജീവത്സാഹിത്യം ഇ.എം.എസ്
2. മാനവഴം എം.എൻ വിജയൻ
3. തിരസ്കാരം കെ.പി അപ്പൻ



CRITERION	I	Curricular Aspects
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4. ആശാന്റെ സീതാകാവ്യം സുകുമാർ അഴീക്കോട്

മൊഡ്യൂൾ 4

ആധുനിക വിമർശനത്തിന്റെ തുടർച്ച ഡോ.എം ലീലാവതി ബി. രാജീ വൻ സ്മൃതിവാദ നിരൂപണം ദലിത് പക്ഷം പരിസ്ഥിതിനിരൂപണം.

വിശദപഠനം

1. ബുദ്ധനും ശിവനും ഡോ. എം ലീലാവതി
2. അനുഭൂതികളുടെ ചരിത്രപരത ബി. രാജീ വൻ (ജനനിബിഡമായ ദന്തഗോപുരം)
3. എഴുത്ത് അധികാരം സൗന്ദര്യം കെ.ഇ.എൻ(സമൂഹം സാഹിത്യം സംസ്കാരം)
4. സരസ്വതീവിജയം (അവതാരിക) കെ.കെ കൊച്ചി
5. കണ്ണാടികൾ ഉടയ്ക്കുന്നതെന്തിന് പി. ഗീത
6. കഥയും പരിസ്ഥിതിയും(ആദ്യ ലേഖനം) ജി. മധുസൂദനൻ

ലൈബ്രറി റെക്കോർഡിലേക്ക് (ഏതെങ്കിലും 5 എണ്ണം)

1. പെൺ വിനിമയങ്ങൾ എസ്. ശാരദക്കുട്ടി
2. കാവ്യകല കുമാരനാശാനിലൂടെ പി.കെ ബാലകൃഷ്ണൻ
3. കുറ്റിപ്പുഴയുടെ പ്രബന്ധങ്ങൾ കുറ്റിപ്പുഴ കൃഷ്ണപിള്ള
4. സൃഷ്ടിയും {സഷ്ടാവുവും എസ്. ഗുപ്തൻനായർ
5. സംസ്കാരപഠനം:ഒരാമുഖം പി.പി രവീന്ദ്രൻ
6. രോഗത്തിന്റെ പൂക്കൾ വി.രാജകൃഷ്ണൻ
7. ആധുനികകോത്തരത:വിശകലനവും വിമർശനവും വി.സി {ശീജൻ
8. പരി സ്ഥിതിസൗന്ദര്യശാസ്ത്രത്തിന്ഒരാ മുഖം ടി.പി സുകുമാരൻ
9. തത്സമയം കൽപറ്റ നാരായണൻ
10. ആനുകാലികങ്ങളിലെ തിരഞ്ഞെടുത്ത ഒരു കവിതയ്ക്ക്സ്വന്തമായി തയ്യാറാക്കുന്ന ഒരു വിമർശനം സഹായകഗ്രന്ഥങ്ങൾ മലയാളനിരൂപണം ഇന്നലെ

2. മലയാളനിരൂപണം: പ്രാരംഭഘട്ടം പി.കെ പരമേശ്വരൻ നായർ സ്മാരക ഗ്രന്ഥാവലി



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3. മലയാളനിരൂപണം: മധ്യഘട്ടം പി.കെ പരമേശ്വരൻ നായർ സ്മാരക ഗ്രന്ഥാവലി
4. മലയാളനിരൂപണം:ആധുനികഘട്ടം പി.കെ പരമേശ്വരൻ നായർ സ്മാരക ഗ്രന്ഥാവലി
5. സമകാലനിരൂപണത്തിന്റെ വ്യത്യസ്ത മുഖങ്ങൾ പി.കെ പരമേശ്വരൻ നായർ സ്മാരക ഗ്രന്ഥാവലി
6. സുകുമാർ അഴീക്കോട് മലയാള സാഹിത്യവിമർശനം
7. ജോസഫ് മുണ്ടശ്ശേരി മുണ്ടശ്ശേരി കൃതികൾ മൂന്നുഭാഗം(1981) കോട്ടയം, ഡി.സി ബുക്സ്
8. ഇ.എം.എസ് നമ്പൂതിരിപ്പാട് തെരെഞ്ഞെടുത്ത പ്രബന്ധങ്ങൾ (1980) സാഹിത്യഅക്കാദമി, തൃശ്ശൂർ
9. പി.കെ നാരായണപിള്ള പഞ്ചാനന്ദൻ വിമർശനത്രയം, കേരളസാഹിത്യ അക്കാദമി, തൃശ്ശൂർ.
10. എം. പി പോൾ നോവൽ സാഹിത്യം, എസ്.പി.എ സ് കോട്ടയം, 1990 11. എം. പി. പോൾ സാഹിത്യവിചാരം, പൂർണ്ണ പബ്ലിക്കേഷൻ, കോഴിക്കോട്, 1991
12. ജി. മധുസൂദനൻ ഹരിത നിരൂപണം മലയാളത്തിൽ, കരന്റ് ബുക്സ് തൃശ്ശൂർ, 2002
13. കവിയൂർ മുരളി ദലിത് സാഹിത്യം, ഡി.സി ബുക്സ്, കോട്ടയം,2001 14. പി.പി രവീന്ദ്രൻ ആധുനികാനന്തരം വിചാരം വായന,കരന്റ് ബുക്സ് തൃശ്ശൂർ, 1999
15. രാജീവൻ.ബി ജനനിബിഡമായ ദന്തഗോപുരം, ചിന്ത പബ്ലിക്കേഷൻസ്, തിരുവനന്തപുരം, 1991
16. ഡോ. എം ലീലാവതി സാഹിത്യനിരൂപണത്തിലെ ദിശാബോധം, എസ്. പി. സി. എസ് കോട്ടയം, 2000
17. ഡോ.എസ്.കെ വസന്തൻ പ്രാസവാദം
18. എ.ആർ രാജരാജവർമ്മ സാഹിത്യസാഹ്യം
19. ആർ. രാമചന്ദ്രൻ(എഡി) നിരൂപണം പുതിയമുഖം
20. ഡോ. എം. മുരളീധരൻ എം.പി പോളിന്റെ സാഹിത്യവിമർശനം



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21. പി.പി വേലായുധൻപിള്ള മലയാള സാഹിത്യവിമർശനം
22. വി.സി ശ്രീജൻ ആധുനികകോത്തരത വിശകലനവും വിമർശനവും എസ്. പി .സി.എസ് കോട്ടയം
23. തി.കു.ഗി.ശ്ശി ഗംഗാധരൻ (സമ്പാദനം) കേരളവർമ്മയുടെ തെരഞ്ഞെടുത്ത ഗദ്യകൃതികൾ
24. എം.എൻ വിജയൻ കേസരിയുടെ സാഹിത്യവിമർശനങ്ങൾ
25. എം.ആർ ചന്ദ്രശേഖരൻ കേരളത്തിലെ പുരോഗമന സാഹിത്യപ്രസ്ഥാനത്തിന്റെ ചരിത്രം
26. എം.എൻ വിജയൻ സമ്പൂർണ്ണകൃതികൾ, കരന്റ് ബുക്സ്, തൃശ്ശൂർ, 2005
27. ജെ.ദേവിക സ്ത്രീവാദം, ഡി. സി ബുക്സ്
28. എസ്. ശാരദക്കുട്ടി പെൺവിനിമയങ്ങൾ

നാടോടിവിജ്ഞാനീയം

MAL5B10 നാടോടിവിജ്ഞാനീയം

മൊഡ്യൂൾ 1

ഫോക്ലോർ പദനിഷ്പത്തി നിർവ്വചനങ്ങൾ സവിശേഷതകൾ ഫോക്ലോർ പഠനത്തിന്റെ പ്രസക്തി ലക്ഷ്യം സാമൂഹ്യധർമ്മം വർഗീകരണം പഠനചരിത്രം ഇതരവിഷയങ്ങളുമായുള്ള ബന്ധം

മൊഡ്യൂൾ 2

നാടൻപാട്ടുകൾ വർഗീകരണവും സാഹിത്യപരിചയവും വടക്കൻ പാട്ട് തെക്കൻ പാട്ട് മാപ്പിളപ്പാട്ട് സവിശേഷതകൾ കടങ്കഥ പഴഞ്ചൊല്ല് സ്വഭാവപരിചയം നാടോടികഥകൾ പുരാവൃത്തങ്ങൾ ഐതീഹ്യങ്ങൾ (ഓരോ വിഭാഗത്തിനും ഉദാഹരണങ്ങൾ കെത്തി സാമാന്യധാരണ നേടേണ്ടത്).

മൊഡ്യൂൾ 3

തെയ്യം മുടിയേറ്റ് പടയണി മാർഗ്ഗം കളി ഒപ്പന വട്ടപ്പാട്ട് റാത്തിണ്ണാമാന്യധാരണ നാടോടി സാഹിത്യവും മുഖ്യധാരാസാഹിത്യവും

മൊഡ്യൂൾ 4



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നാട്ടാചാരങ്ങൾ നാടോടി വാദ്യങ്ങൾ വിനോദങ്ങൾ അനുഷ്ഠാനങ്ങൾ ആഘോഷങ്ങൾ നാടൻ ഭക്ഷണം വൈദ്യം സാമാന്യധാരണ.

സഹായകഗ്രന്ഥങ്ങൾ

1. ഫോക്ലോർ ഡോ. രാഘവൻ പയ്യനാട്
2. നാടോടി വിജ്ഞാനീയം ഡോ.എം.വി വിഷ്ണുനമ്പൂതിരി
3. ഫോക്ലോർ നിഘണ്ടു ഡോ.എം.വി വിഷ്ണുനമ്പൂതിരി
4. ഫോക്ലോറിന് ഒരു പഠന പദ്ധതി ഡോ. രാഘവൻ പയ്യനാട്
5. കേരള ഫോക്ലോർ ഡോ. രാഘവൻ പയ്യനാട്
6. ജനസംസ്കാര പഠനങ്ങൾ ഡോ. യഹൂദ്യ പുളിക്കൽ(എഡി)
7. മാപ്പിള ഫോക്ലോർ പ്രൊഫ. ബി മുഹമ്മദ് അഹമ്മദ്
8. കേരളത്തിന്റെ നാടോടി സംസ്കാരം കാവാലം നാരായണപണിക്കർ
9. കളിയാട്ടം സി.എം.എസ് ചന്തേര
10. പടയണി അനുഷ്ഠാനം, പുരാവൃത്തം,പൊരുൾ ഡോ.കെ വിദ്യാ സാഗർ
11. ഫോക്ലോർ സംസ്കാരപഠനങ്ങൾ പ്രൊഫ.ബി മുഹമ്മദ്
12. ഫോക്ലോർ സിദ്ധാന്തവും രാഷ്ട്രീയവും ഡോ.കെ എം. ഭരതൻ
13. ഫോക്ലോർ സിദ്ധാന്തങ്ങൾ ഡോ.സി.ആർ രാജഗോപാലൻ
14. ഫോക്ലോർജനുസ്സ് : സിദ്ധാന്തം,രാഷ്ട്രീയം കെ എം അനിൽ
15. കടങ്കഥ സൗന്ദര്യവും സംസ്കാരവും കെ എം അനിൽ

ഭാഷാശാസ്ത്രവും ഭാഷാചരിത്രവും

MAL6B11 ഭാഷാശാസ്ത്രവും ഭാഷാചരിത്രവും

മൊഡ്യൂൾ 1

1. ഭാഷ നിർവചനം, ആശയവിനിമയ വ്യവസ്ഥ,ഭാഷ യുടെ പൊതു സ്വഭാവങ്ങൾ, വാമൊഴിവര മൊഴി ഭേദം.



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2. ഭാഷാഭാവവിധിഗുണങ്ങൾ മാതൃഭാഷ, ഒന്നാംഭാഷ/ രാജഭാഷ, ജീവദാർശനം, മൂലഭാഷ, സങ്കരഭാഷ, വൈകല്യഭാഷ,ഔദ്യോഗികഭാഷ,മാനകഭാഷ

3. ഭാഷാശാസ്ത്ര സമീപനം നിർദ്ദേശാത്മകം, വിവരണാത്മകം, ചരിത്രാത്മകം, തുലനാത്മകം, വ്യതിരേകാത്മകം

4. **ഭാഷാഗോത്ര സങ്കല്പം പ്രധാനഭാഷാഗോത്രങ്ങൾ ദ്രാവിഡഗോത്രം കക്ഷ്യാവിഭജനം**

മൊഡ്യൂൾ 2

1. സ്വന്തവിജ്ഞാനം സ്വന്തം ശബ്ദോച്ചാരണം സ്വരം, വ്യഞ്ജനം, അക്ഷരം, ലീനധ്വനികൾ

2. സ്വനിമവിജ്ഞാനം സ്വനിമത്തിന്റെ പ്രസക്തി, ഉപസ്വനം, സ്വതന്ത്രപരിവർത്തനം, രൂപിമം, രൂപിമ വിഭാഗങ്ങൾ സ്വതന്ത്രം, ബദ്ധം

3. വാക്യവിചാരം വാക്യഘടന, വാക്യാപഗ്രഥനം, രചനാന്തരണ പ്രജനകവ്യാകരണം

4. **അർത്ഥവിചാരം അർത്ഥപരിണാമം, അർത്ഥവും സമൂഹവും, പര്യായം, നാനാർത്ഥം, വിപരീതം, ആർത്ഥികക്ഷേത്രം**

മൊഡ്യൂൾ 3

1. സാമൂഹിക ഭാഷാശാസ്ത്രം ഭാഷയും സമൂഹവും, ഭാഷയും അധികാരവും, ആചാരഭാഷ, അധികാരഭാഷ, വിലക്കുഭാഷ, തെറിഭാഷ

2. **ഭാഷാഭേദവിജ്ഞാനം വ്യക്തിഭാഷ, ഭാഷാഭേദം, കേരളത്തിലെ ഭാഷാഭേദങ്ങൾ**

3. ചരിത്രപുനർനിർമ്മാണം ആന്തരിക/ബാഹ്യപുനർനിർമ്മാണം

4. ഭാഷയോടുള്ള മനോഭാവം, ഭാഷാസൂത്രം, ദ്രാവിഡഗോത്രത്തിൽ മലയാളത്തിനുള്ള സ്ഥാനം, ഘട്ടവിഭജനം

മൊഡ്യൂൾ 4

1. മലയാളഭാഷാത്പത്തി സിദ്ധാന്തങ്ങൾ സംസ്കൃതജന്യവാദം,മിശ്രഭാഷാവാദം, സ്വതന്ത്രവാദം, ഉപശാഖാവാദം, പൂർവ്വ തമിഴ്ലയാള വാദം, കേരളപാണിനീയത്തിലെ ആറുനയങ്ങളും വിമർശനവും



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2. ആനുകാലിക മലയാളം നവമാധ്യമങ്ങളും മല യാളവും, പരസ്യഭാഷ, കോംപിയറിംഗ് മലയാളം, എസ്.എം.എസ് മലയാളം, മലയാളം ഫോൺകൾ, സാമാന്യപരിചയം

3. മാതൃഭാഷയുടെ സമകാലിക പ്രസക്തി, മാതൃഭാഷ പഠനമാധ്യമം എന്നനിലയിൽ, ലോക മാതൃഭാഷാദിനം, മാതൃഭാഷയ്ക്കുവേണ്ടിയുള്ള സമരങ്ങൾ
4. ഭാഷയും ഭരണഭാഷയും, ശ്രേഷ്ഠഭാഷാസങ്കല്പം, കോടതിഭാഷ, മലയാളം ടൈപ്പിംഗ്, ഐ. എസ്.എം/യൂണികഡ് (സാമാന്യപരിചയം), മലയാളം നേരിടുന്ന വെല്ലുവിളികൾ സഹായകഗ്രന്ഥങ്ങൾ

1. മലയാളം മാറ്റവും വളർച്ചയും കെ എം പ്രഭാകരവാര്യർ
2. ഭാഷാശാസ്ത്രവിവേകം കെ എം പ്രഭാകരവാര്യർ
3. ഭാഷാവലോകനം കെ എം പ്രഭാകരവാര്യർ
4. പൂർവകേരളഭാഷ കെ എം പ്രഭാകരവാര്യർ
5. ഭാഷാശാസ്ത്രപരിചയം വി ആർ പ്രബോധചന്ദ്രൻനായർ
6. സ്വന്തവിജ്ഞാനം വി ആർ പ്രബോധചന്ദ്രൻനായർ
7. ഭാഷാശാസ്ത്രനിഘണ്ടു വി ആർ പ്രബോധചന്ദ്രൻനായർ
8. ഭാഷാശാസ്ത്രദൃഷ്ടിയിലൂടെ വി ആർ പ്രബോധചന്ദ്രൻനായർ
9. ദ്രാവിഡഭാഷകൾ വി ആർ പ്രബോധചന്ദ്രൻനായർ
10. ഭാഷാർത്ഥം ടി ബി വേണുഗോപാലപ്പണിക്കർ
11. വാക്കിന്റെ വഴികൾ ടി ബി വേണുഗോപാലപ്പണിക്കർ
12. ഭാഷാലോകം ടി ബി വേണുഗോപാലപ്പണിക്കർ
13. സാമൂഹികഭാഷാശാസ്ത്രം ഉഷാനന്ദുതിര ിപ്പാട്
14. ഭാഷാഭേദവിജ്ഞാനം പി സോമശേഖരൻനായർ
15. അധികാരവും ഭാഷയും പി.എം ഗിരീഷ്
16. സ്വത്വവും വിനിമയവും പി.എം ഗിരീഷ്
17. അറിവും ഭാഷയും പി.എം ഗിരീഷ്
18. തെളിമലയാളം എം.എൻ കാരശ്ശേരി
19. കേരളഭാഷയുടെ വികാസപരിണാമങ്ങൾ ഇളംകുളം കുഞ്ഞൻപിള്ള
20. കേരളഭാഷാവിജ്ഞാനീയം കെ ഗോദവർമ്മ



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21. കേരളപാണിനീയം എ.ആർരാജരാജവർമ്മ
22. കേരളകൗമുദി കോവുണ്ണി നെടുങ്ങാടി
23. മലയാളത്തിലെ പരകീയപദങ്ങൾ പി.എം ജോസഫ്

ഗദ്യസാഹിത്യം

MAL6B12 ഗദ്യസാഹിത്യം

മൊഡ്യൂൾ 1

ശാസനകാലം ശാസനങ്ങളുടെ രൂപപരമായ സവിശേഷതകൾ, ലിപിവിന്യാസം, ഭാഷാപരമായ സവിശേഷതകൾ, ശാസനഭാഷയിലെ സമകാലീന ഭാഷാപ്രതിഫലനം വാക്കുകൾ, ശൈലികൾ, സന്ധി, വർണ്ണപരിണാമം എന്നീ ഭാഷാസവിശേഷതകൾക്ക് ഊന്നൽ മധ്യകാലം മണിപ്രവാളവും ഗദ്യസാഹിത്യവും, കുത്തും കൂടിയാട്ടവും ഗദ്യത്തിന്റെ വികാസത്തിൽ ചെലുത്തിയ സ്വാധീനം, ആട്ടപ്രകാരങ്ങളും ക്രമദീപികകളും നമ്പ്യാർത്ഥി ഭാഷാപരമായ പ്രത്യേകതകൾ.

വിശദപഠനത്തിന്

1. വാഴപ്പിള്ളിശാസനം നമ്പർ 1 ഉദ്ധരണം (കേരളഭാഷയുടെ വികാസപരിണാമങ്ങൾ)
2. ഭാഷാകൗടലീയം നമ്പർ 1 ഉദ്ധരണം (കേരളഭാഷയുടെ വികാസപരിണാമങ്ങൾ)
3. ശൂർപ്പണഖാങ്കം നമ്പർ 1 ഉദ്ധരണം (കേരളഭാഷയുടെ വികാസപരിണാമങ്ങൾ)

മൊഡ്യൂൾ 2

വൈദേശികസ്വാധീനം മിഷണറിമാരുടെ ആഗമനം മലയാളഭാഷയ്ക്കായ വളർച്ച ഉദയം പേരൂർ സുന്നഹദോസ് അച്ചടി സംക്ഷേപവേദാർത്ഥം



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പുല്ലേലികുഞ്ചു വർത്തമാനപുസ്തകം കംജോർജ്ജ് മാത്തൻ, ഗുർട്ട് തുടങ്ങിയവരുടെ സംഭാവനകൾ അറബിമലയാള സാഹിത്യത്തിലെ ഗദ്യം വമ്പ് വിശദപഠനത്തിന്

1. ഉദയംപേരൂർ സുനഹദസിന്റെ കാനോനുകൾ, ഒന്നാം യോഗ വിചാരം സ്കറിയാ സക്കറിയ (എഡി)
2. വർത്തമാനപുസ്തകം ആദ്യപാദം

മൊഡ്യൂൾ 3

മലയാള ഗദ്യത്തിന്റെ ആധുനീകരണം അച്ചടിയുടെ വ്യാപനം പത്രങ്ങൾ, ആനുകാലികങ്ങൾ വിവർത്തനങ്ങൾ പാഠപുസ്തകനിർമ്മിതി സാഹിത്യ നിരൂപണത്തിന്റെ ആദ്യഘട്ടം വിശദപഠനത്തിന്

1. മൃഗയാസൂരണകൾ കേരളവർമ്മ വലിയകോയിത്തമ്പുരാൻ
2. സാഹിത്യസാഹ്യം ഏ.ആർ രാജരാജവർമ്മ
3. മലയാളശൈലി കുട്ടികൃഷ്ണമാരാർ (ആദ്യത്തെ മൂന്ന് അധ്യായങ്ങൾ)

മൊഡ്യൂൾ 4

ഗദ്യരചനയിലെ പുതിയസമീപനങ്ങൾ പാശ്ചാത്യസാഹിത്യമാതൃകകളുടെ പ്രേരണകളും സ്വാധീനങ്ങളും പുതിയവാക്കുകളും ഭാഷാഘടനയും ഭാഷാഗദ്യത്തിന്റെ വൈവിധ്യം ജീവചരിത്രം ആത്മകഥ, സ്മരണകൾ, യാത്രാവിവരണങ്ങൾ, വൈജ്ഞാനിക സാഹിത്യം വിശദപഠനത്തിന്

1. ആനയും അൽപം തെലുങ്കും എ.പി ഉദയഭാനു(ഉദയഭാനുവിന്റെ തെരഞ്ഞെടുത്ത ഉപന്യാസങ്ങൾ, ഡി.സി ബുക്സ്)
2. നാടകാഭിനയം ചില ചിന്തകളും സ്മരണകളും കൈനിക്കരകുമാരപിള്ള
3. ചീന്തിപ്പോയ ഒരേട് എം.ആർ ബി (മുഖചരയകൾ)
4. പെണ്ണുകൊത്തിയ വാക്ക് ശാരദക്കുട്ടി
5. തിരമൊഴി പി.പി രാമചന്ദ്രൻ

ലൈബ്രറി റെക്കോർഡിലേക്ക് (ഏതെങ്കിലും 5 എണ്ണം)

1. വി.ടി ഭട്ടതിരിപ്പാട് കണ്ണീരും കിനാവും



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2. കുറ്റിപ്പുഴ കൃഷ്ണപിള്ള കുറുപ്പുഴ കൃഷ്ണപിള്ളയുടെ തെരഞ്ഞെടുത്ത പ്രബന്ധങ്ങൾ
 3. രാജൻ കാക്കനാടൻ ഹിമവാന്റെ മുകൾത്തട്ടിൽ
 4. എൻകൃഷ്ണപിള്ള കൈരളിയുടെ കഥ
 5. പുതുശ്ശേരി രാമചന്ദ്രൻ പ്രാചീന മലയാളം
 6. പി.ജെ തോമസ് മലയാളസാഹിത്യവും ക്രിസ്ത്യാനികളും
 7. ഒ.അബു അറബിമലയാള സാഹിത്യചരിത്രം
 8. ഡോ.പി.വി വേലായുധൻപിള്ള മധ്യ കാല മലയാളം.
 9. എം.എൻ കാരശ്ശേരി കുറിമാനം
 10. നിത്യചൈതന്യയതി ഗുരുവും ശിഷ്യനും സഹായകഗ്രന്ഥങ്ങൾ
1. ഡോ. പി.കെ നാരായണപ്പിള്ള പ്രാചീനമലയാള ഗദ്യമാതൃകകൾ, കേരളസർവ്വകലാശാല
 2. ഡോ.എം.എം പുരുഷോത്തമൻനായർ പ്രാചീന ഭാഷാഗദ്യമാതൃകകൾ, കാലിക്കറ്റ് സർവ്വകലാശാല
 3. കെ.സാംബശിവശാസ്ത്രി വി.എ രാമസ്വാമിശാസ്ത്രി ഭാഷാകൗടലീയം, കേരള സർവ്വകലാശാല
 4. ഡോ. കെ.എം പ്രഭാകരവാര ിയർ മലയാളം മാറ്റവും വളർച്ചയും, വള്ളത്തോൾ വിദ്യാപീഠം, ശുകപുരം
 5. ഡോ.പി.വി വേലായുധൻ മധ്യകാല മലയാളം, കരന്റ് ബുക്സ്
 6. സി.എൽ ആന്റണി ഭാഷാപഠനങ്ങൾ, കേരളസാഹിത്യ അക്കാദമി
 7. കെ.എം. പ്രഭാകരവാര്യർ ഡോ.പി.എൻ രവീന്ദ്രൻ(സമ്പാദകർ) മലയാളഭാഷാപഠനങ്ങൾ, കേരളഭാഷാഇൻസ്റ്റിറ്റ്യൂട്ട്
 8. കെ. രത്നമ്മ മലയാളഭാഷാചരിത്രം എഴുത്തച്ഛൻ വരെ കരന്റ് ബുക്സ്
 9. ഇളംകുളം കുഞ്ഞൻപിള്ള കേരളഭാഷയുടെ വികാസപരിണാമങ്ങൾ, എസ്.പി.സി.എസ്
 10. ഡോ. ബാബു ചെറിയാൻ, ജേക്കബ് ഐസക് ജ്ഞാനനികേഷപഠപാഠനവും പാഠവും, പ്രഭാത് ബുക്സ്



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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11. സാമൂഹ്യ ചങ്ങമ്പള്ളി വർത്തമാനപുസ്തകം, എൻബി.എസ്
12. എം.ജയരാജ് മലയാള അച്ചടിമാധ്യമം ഭൂതവും വർത്തമാനവും മാതൃഭൂമി ബുക്സ്
13. ജി. കമലമ്മ മലയാളഭാഷയുടെ അടിവേരുകൾ, കരൻ്റ് ബുക്സ്
14. കെ.രാമചന്ദ്രൻ നായർ കേരളവർമ്മ സ്മരണ, കേരളഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്
15. ഏ.ആർ.രാജരാജവർമ്മ സാഹിത്യസാഹ്യം, എസ്.പി.സി.എസ്
16. എം.എൻ കാരശ്ശേരി തായ്മൊഴി, ഡി.സി ബുക്സ്
17. കെ.എം ഗോവി ആദിമുദ്രണം ഭാരതത്തിലും കേരളത്തിലും (അച്ചടിയുടെ ചരിത്രം) കേരളസാഹിത്യ അക്കാദമി
18. ഉള്ളൂർ കേരളസാഹിത്യ ചരിത്രം, കേരള സർവ്വകലാശാല
19. എൻ. കുറുപ്പിള്ളി കൈരളിയുടെ കഥ
20. എസ്. ഗുപ്തൻ നായർ ഗദ്യം പിന്നിട്ട വഴികൾ
21. നടുവട്ടം ഗോപാലകൃഷ്ണൻ ആത്മകഥാസാഹിത്യം
22. ഡോ. കെ.എം.ജോർജ്ജ് ജീവചരിത്രസാഹിത്യം
23. സാമൂഹ്യ ചങ്ങമ്പള്ളി മിഷനറി മലയാള ഗദ്യമാതൃകകൾ
24. സ്കറിയ സക്കറിയ രൂപ്രചീന ഗദ്യകൃതികൾ
25. ചാത്തനാത്ത് അച്യുതനുണ്ണി, സാമൂഹ്യ ചങ്ങമ്പള്ളി വർത്തമാന പുസ്തകത്തിന് ഒരു അവതാരിക
26. എം. രാഘവവർമ്മരാജാ, ഭഗീരഥി അമ്മതമ്പുരാൻ ഏ.ആർ രാജരാജവർമ്മ
27. ഷംസുദ്ദീൻ കെ.ഒ മാപ്പിളമലയാളം, ലിപി പബ്ലിക്കേഷൻസ് കോഴിക്കോട്
28. ടി.മൻസൂറലി (എഡി) അറബിമലയാള സാഹിത്യപഠനങ്ങൾ, വചനം ബുക്സ്, കോഴിക്കോട്
29. സി.എൻ അഹമ്മദ് മൗലവി, കെ.കെ മുഹമ്മദ് അബ്ദുൾ കരീം മഹത്തായ മാപ്പിളസാഹിത്യപാരമ്പര്യം ആസാദ് ബുക്സ്സ്റ്റാൾ, കോഴിക്കോട്



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പൗരസ്ത്യസിദ്ധാന്തങ്ങൾ

MAL6B13 പൗരസ്ത്യസിദ്ധാന്തങ്ങൾ

മൊഡ്യൂൾ 1

കവി, കാവ്യം, സഹൃദയൻ എന്നീ സംജ്ഞകളെ ഭാരതീയമായ കാഴ്ചപ്പാടിൽ മനസ്സിലാക്കുക. രസം, ധ്വനി, രീതി, ഗുണം, അലങ്കാരം, എന്നീ സങ്കല്പനങ്ങളെക്കുറിച്ച് സാമാന്യമായ പഠനം. ശബ്ദശക്തി കൾ അഭിധ, ലക്ഷണ, വ്യഞ്ജന, (നിർവചനവും വിശദീകരണവും മാത്രം)

വിശദപഠനത്തിന്

1. കാവ്യഹേതുകൾ ചാത്തനാത്ത് അച്യുതനുണ്ണി (കാവ്യചിന്ത)
2. ഭാഷാഭൂഷണത്തിലെ ഗുണപ്രകരണം, ശബ്ദാർത്ഥപ്രകരണം, ധ്വനിപ്രകരണം, രസപ്രകരണം, (നിർവചനവും വിശദീകരണവും മാത്രം)

മൊഡ്യൂൾ 2

കാവ്യപ്രയോജനത്തെ സംബന്ധിച്ച സംസ്കൃതാചാര്യന്മാരുടെ വ്യത്യസ്ത അഭിപ്രായങ്ങൾ, ഭരതൻ, മമ്മടൻ, ഭാമഹൻ, ദണ്ഡി, കുന്തകൻ, തുടങ്ങിയവരുടേത്

വിശദപഠനത്തിന്

ഗുണപ്രകരണം ഭാഷാഭൂഷണം(ഗുണങ്ങളുടെ നിർവചനവും വിശദീകരണവും മാത്രം മതി)

ഇന്ത്യൻ സാഹിത്യ സിദ്ധാന്തം: പ്രസക്തിയും സാധ്യതയും അയ്യപ്പപണിക്കർ(ആദ്യ ര് അധ്യായങ്ങൾ)

മൊഡ്യൂൾ 3

വൃത്തം മലയാള കവി തയിൽ വൃത്തത്തിനുള്ള സ്ഥാനം വൃത്തവും താളവും വൃത്തമഞ്ജരി യിലെ പ്രധാന വൃത്തങ്ങൾ വിശദ പഠനത്തിന് വൃത്തങ്ങളുടെ താരതമ്യം

വിശദപഠനത്തിന്

1. വൃത്തമഞ്ജരിയിലെ പരി ഭാഷാപ്രകരണം സംസ്കൃത വൃത്തങ്ങളുടെയും ഭാഷാ വൃത്തങ്ങളുടെയും പൊതു സ്വഭാവവും സവിശേഷതകളും അറിഞ്ഞിരിക്കണം. സംസ്കൃത വൃത്തങ്ങൾ അനുഷ്ടുപ്പ്, ഇന്ദ്രവജ്ര, രഥോദ്ധത,



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ഭൂതവിളംബിതം, വസന്തതിലകം, മാലിനി, മന്ദാകാന്താ, ശാർദൂലവിക്രീഡിതം, സ്രഗ്ദ്ധം, വിയോഗിനി, പുഷ്പിതാഗ്ര, എന്നിവ വിശദപഠനം, ഭാഷാ വൃത്തങ്ങളിൽ കിളിപ്പാട്ട്, തരംഗിണി, ശിതാഗ്ര, മഞ്ജരി, നതോന്നത.

മൊഡ്യൂൾ 4

അലങ്കാര ഭാഷാഭൂഷണത്തിലെ അലങ്കാരങ്ങളെക്കുറിച്ച് സാമാന്യമായ ധാരണവേണം

വിശദപഠനത്തിന്

ഭാഷാഭൂഷണത്തിലെ അലങ്കാരവിഭജനവും വിഭാഗങ്ങളും അലങ്കാരത്തിന്റെ പ്രസക്തി

സാമ്യോക്തി വിഭാഗം ഉപമ രൂപകം, ഉൽപ്രേക്ഷ, പ്രതിവസ്തുപമദ്യഷ്ടാന്തം, അപ്രസ്തുതപ്രശംസ, ദീപകം

അതിശയോക്തിവിഭാഗം രൂപകാതിശയോക്തി, വിശേഷോക്തി, ഉല്ലേഖം, വിരോധാഭാസം

വാസ്തുവോക്തിവിഭാഗം സ്വഭാവോക്തി, സമുച്ചയം, അത്ഥാപത്തി, കാവ്യലിംഗം, അർത്ഥാന്തരന്യാസം ശ്ലേഷോക്തി വിഭാഗം ശ്ലേഷം, സമാസോക്തി എന്നീ അർത്ഥാലങ്കാരങ്ങൾ

പ്രാസം, അനുപ്രാസം, ഛേദകാനുപ്രാസം, ദ്വിതീയാക്ഷരപ്രാസം, യമകം എന്നീ ശബ്ദാലങ്കാരങ്ങൾ. ഈ അലങ്കാരങ്ങളെല്ലാം വിശദപഠനത്തിന്, അലങ്കാരങ്ങളുടെ സാമ്യവ്യത്യാസങ്ങൾ മനസ്സിലാക്കണം.

അലങ്കാരങ്ങളുടെ ലക്ഷണസമന്വയം സാധ്യമാക്കണം

സഹായഗ്രന്ഥങ്ങൾ

1. ഭാരതീയകാവ്യശാസ്ത്രം ടി. ഭാസ്കരൻ
2. കാവ്യമീമാംസ കെ. സുകുമാരപ്പിള്ള
3. ഭാരതീയസാഹിത്യസിദ്ധാന്തങ്ങൾ ചാത്തനാത്ത് അച്യുതനൂണി
4. അലങ്കാരശാസ്ത്രം മലയാളത്തിൽ ചാത്തനാത്ത് അച്യുതനൂണി
5. രീതിദർശനം ചാത്തനാത്ത് അച്യുതനൂണി
6. വൃത്തവിചാരം കെ.കെ വാല്യാർ
7. വൃത്തശില്പം കുട്ടികൃഷ്ണമാരാർ



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8. വൃത്തശാസ്ത്രം ഡോ.ടി.വി മാത്യു
9. വിശ്വസാഹിത്യദർശനങ്ങൾ നെല്ലിക്കൽ മുരളീധരൻ
10. ഭാഷാഭൂഷണം ഏ.ആർ രാജരാജവർമ്മ
11. വൃത്തമഞ്ജരി ഏ.ആർ രാജരാജവർമ്മ
12. താരതമ്യകാവ്യശാസ്ത്രം സി. രാജേന്ദ്രൻ
13. കാവ്യജീവിതവൃത്തി പി. കൃഷ്ണൻനായർ
14. സാഹിത്യഭൂഷണം കുട്ടികൃഷ്ണപ്പാർ
15. കാവ്യപീഠിക ജോസഫ് മുശ്ശേരി

നവസംസ്കാര പഠനങ്ങൾ

MAL6B14 നവസംസ്കാര പഠനങ്ങൾ

മൊഡ്യൂൾ 1

സംസ്കാരം: നിർവചനം സമീപനങ്ങൾ പ്രകൃതിയും സംസ്കാരവും ഭാഷയും സംസ്കാരവും സംസ്കാരവും നാഗരികതയും സംസ്കാരത്തിന്റെ തലങ്ങൾ: ദേശീയത, പ്രാദേശികത അല്ലെങ്കിൽ ധർമ്മപരമായ ആർജ്ജവം ബോധപൂർവ്വമായ നിർമ്മാണം സംസ്കാര പഠനത്തിലെ സാമ്പ്രദായിക നില പാടുകൾ സാംസ്കാരിക ഭൗതികവാദം യൂറോപ്യൻ സംസ്കാരത്തിന്റെ ആദ്യകാല രീതിശാസ്ത്രം.

ജനപ്രിയസംസ്കാരം ഉച്ചസംസ്കാരം നീചസംസ്കാരം സംസ്കാരവ്യവസായം അപരത്വ നിർമ്മാണം സത്യാന്വേഷണങ്ങൾ ജനപ്രിയസാഹിത്യം സംസ്കാരത്തെക്കുറിച്ച് മാത്യു അർണോൾഡ് നെയും എഫ്. ആർ. ലീവിസിന്റെയും റെജ് വിലുംസിന്റെയും വീക്ഷണങ്ങൾ സംസ്കാര പഠനവും സംസ്കാര നിരൂപണവും തമ്മിലുള്ള വ്യത്യാസം.

വിശദപഠനം

1. സാഹിത്യവും സംസ്കാരപഠനവും ഇ.വി രാമകൃഷ്ണൻ



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2. മലയാള സാഹിത്യത്തിൽ മലബാറനെ പ്രമുഖം
മലബാർദേശീയതയുടെ ഇടപാടുകൾ എം.ടി അൻസാരി
3. വീടുകേന്ദ്രവിയും മാറ്റിവെക്കലും പി.കെ പോക്കർ (ആദ്യ ലേഖനം)
മൊഡ്യൂൾ 2

പരി സ്ഥിതി സാഹിത്യം സൗന്ദര്യശാസ്ത്രം ഹരിത രാഷ്ട്രീയം
ഗോത്രസംസ്കൃതി കാർഷിക സംസ്കൃതി പരിസ്ഥിതിസമരങ്ങൾ
പ്രസ്ഥാനങ്ങൾ സൈലന്റ് വാലി, ചിപ്കോ, നർമ്മദാബച്ചാവോ ആന്തോളൻ,
പ്ലാച്ചിമട എൻഡോസൾഫാൻ
വിശദപഠനം

1. പരിസ്ഥിതിസൗന്ദര്യശാസ്ത്രത്തിന്റെ പരി പ്രേക്ഷ്യം ടി.പി സുകുമാരൻ
(ഉർവരതയുടെ താളം)

2. സംസ്കാരം ആവാസ വ്യവസ്ഥയെന്ന നിലയിൽ ജി.
മധുസൂദനൻ(സംസ്കാരപഠനം:
ചരിത്രം സിദ്ധാന്തം പ്രയോഗം)

മൊഡ്യൂൾ 3
സ്ത്രീവാദം ലിംഗം, ലൈംഗികം എന്നീ പരികല്പനകൾ
ഉടലെടുത്ത് ഫെമിനിസത്തിലെ വ്യത്യസ്ത ചിന്താധാരകൾ സാമൂഹ്യ
സ്ത്രീവാദം, ഇക്കോ ഫെമിനിസം മാർക്സിസ്റ്റ് ഫെമിനിസം, ഇസ്ലാമിക
സ്ത്രീവാദം, ബ്ലാക്ക് ഫെമിനിസം, മലയാളത്തിലെ ഫെമിനിസ്റ്റ്
എഴുത്തുകാരികളും പെണ്ണുഴുത്തുകളും സാഹിത്യത്തിലും ഭാഷയിലും
സ്ത്രീവാദ സ്വാധീനം.

വിശദപഠനം

1. അച്ചമയ്ക്കുസമ്പവിച്ചത് കെ ആർ മീര
2. കുലടയ്ക്കും കുലീനയ്ക്കും അപ്പുറം: ലിംഗഭേദവിചാരം
സരസ്വതിയമ്മയുടെ കൃതികളിൽ (സരസ്വതിയമ്മയുടെ
സമ്പൂർണകൃതികളുടെ ആമുഖം ജെ ദേവിക)

3. ഓരോ എഴുത്തുകാരിയുടെ ഉള്ളിലും സാറാജോസഫ്
മൊഡ്യൂൾ 4



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ഭട്ടിത് സങ്കല്പനം സാഹിത്യം പ്രാന്തവത്കൃത വിഭാഗങ്ങളുടെ ആത്മപ്രകാശനങ്ങൾ ഗോത്ര ഗാനങ്ങൾ നാടൻ പാട്ടുകൾ നവോന്നമാന രചനകൾ ഭട്ടിത് ചിന്തയുടെ വളർച്ച, ഇന്നുള്ള അവസ്ഥ വിശദപഠനം

1. സരസ്വതീ വിജയം പോത്തേരി കുഞ്ഞമ്പു
 2. ഭട്ടിത് സാഹിത്യ പ്രസ്ഥാനം കെ.സി പുരുഷോത്തമൻ(ഭട്ടിതൻആരാണ്, ഭട്ടിത് സാഹിത്യം എന്ത്, എന്തിന് എന്നീ അധ്യായങ്ങൾ മാത്രം. കേരള സാഹിത്യഅക്കാദമി.2008)
 3. എരി പ്രദീപൻ പാമ്പിരിക്കുന്ന്
ലൈബ്രറി റെക്കോർഡിലേക്ക് (5 എണ്ണം)
 1. പരി സ്ഥിതിസൗന്ദര്യ ശാസ്ത്രത്തിനൊരാമുഖം ടി.പി സുകുമാരൻ
 2. കൽക്കാടുകൾക്കിടയിൽ എന്റെ ജീവിതം പൊക്കുടൻ
 3. എൻമകജെ അബിംകാസുതൻമങ്ങാട്
 4. ഭലിത് സാഹിത്യം കവി യൂർ മുരളി
 5. മയിലമ്മ ഒരു ജീവിതം ആത്മകഥ
 6. ജാതിക്കുമ്മി കെ.പി കറുപ്പൻ
 7. മൃഗശിക്ഷകൻ വിജയലക്ഷ്മി
 8. സംസ്കാരത്തിന്റെ രാഷ്ട്രീയം സച്ചിദാനന്ദൻ
 9. സംസ്കാരപഠനം ഒരാമുഖം പി.പി രവീന്ദ്രൻ
 10. കേരളത്തിലെ സ്ത്രീ മുന്നേറ്റങ്ങളുടെ ചരിത്രം സി.എസ് ചന്ദ്രിക
 11. ഭട്ടിത് സൗന്ദര്യശാസ്ത്രം പ്രദീപൻ പാമ്പിരിക്കുന്ന്
- സഹായകഗ്രന്ഥങ്ങൾ
1. സ്ത്രീവാദം ജെ.ദേവിക, ഡി.സി ബുക്സ്
 2. ആദ്യകാല സ്ത്രീകഥകൾ ഡോ.എം.എം. ബഷീർ, ലിപി പബ്ലിക്കേഷൻ
 3. ഉടൽ ഒരു നെയ്ത്ത് ജി. ഉഷാകുമാരി, എൻ.ബി.എസ്
 4. വയലറ്റുനാവിലെ പാട്ടുകൾ ജി. ഉഷാകുമാരി, സൈകതം ബുക്സ്
 5. സ്ത്രീ,സ്ത്രീവാദം,സ്ത്രീ വിമോചനം കെ.ശാരദാമണി, ഡി.സി ബുക്സ്
 6. ആഗോളവത്കരണം,സ്ത്രീ,പ്രകൃതി വന്ദനാശിവ



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7. സ്ത്രീവിമോചനം, ചരിത്രം, സിദ്ധാന്തംസമീപനം എ.കെ രാമകൃഷ്ണൻ, കെ.എം വേണുഗോപാൽ നയനബുക്സ്,കണ്ണൂർ
8. ബുദ്ധനിലേക്കുള്ള ദൂരം കെ.കെ കൊച്ചു, ഡി.സി ബുക്സ്
9. പരി സ്ഥിതിപഠനത്തിന് ഒരാമുഖം എ.അച്ചുതൻ, കേരളശാസ്ത്രസാഹിത്യപരിഷത്ത്,2013
10. തിരസ്കൃതരുടെ രചനാ ഭൂപടം ഒ.കെ സന്തോഷ്,മൈത്രിബുക്സ്,തിരുവനന്തപുരം 11. ഹരിതദർശനം ആധുനികാനന്തരകവിതയിൽ ഡോ.സി.ആർ പ്രസാദ്, സെഡ് ലൈബ്രറിതിരുവനന്തപുരം
12. കഥയും പരിസ്ഥിതിയും ജി. മധുസൂദനൻ, കരന്റ് ബുക്സ്
13. പരി സ്ഥിതിസൗന്ദര്യശാസ്ത്രത്തിന്ഒരു മുഖവുര ടി.പി സുകുമാരൻ, ബോധി പബ്ലിഷിംഗ്ഹൗസ്
14. ദളിത് സാഹിത്യപ്രസ്ഥാനം കെ.സി പുരുഷോത്തമൻ, കേരളസാഹിത്യഅക്കാദമി,2008 15. ദളിതന്റെ നോവ്വം നിന്നവുനാടൻ പാട്ടുകളിൽ ഡോ. കുമാരൻവൈലേരി, പാപ്പിയോൺ
16. വയനാടൻ രാമായണം അസീസ് തരുവണ, മാത്യുഭൂമി
17. ദളിത് സ്വത്വം രാഷ്ട്രീയം, മലയാളകവിതയിൽ എം.അഭിലാഷ്,ലിവിതം ബുക്സ്
18. ദളിത് ചിന്തകൾ ഗെയ്ൽ ഓം വെത്ത്, മാത്യുഭൂമി
19. സാംസ്കാരിക വിമർശനത്തിന് ഒരു രീതിശാസ്ത്രം ജെ.ജെ പള്ളത്ത്
20. സംസ്കാരവും സ്വാതന്ത്ര്യവും എം.എൻ വിജയൻ
21. ദളിത് ഭാഷ കവിയുർ മുരളി
22. കീഴാള ജീവിത മുദ്രകൾ ഡോ.പി.ജി പത്മിനി
23. ഫെമിനിസം എൻ.ജയകൃഷ്ണൻ, കേരളഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്, തിരുവനന്തപുരം
24. കൽപനയുടെ മാറ്റൊലി ജെ.ദേവിക, കേരളസാഹിത്യപരിഷത്ത്
25. വുമണിസം സുജാനാണി മാത്യു, കൈരളിബുക്സ്, കണ്ണൂർ



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26. ജാതിയെ ലിംഗവത്കരിക്കുമ്പോൾ ഉമാചക്രവർത്തി (വിവ പി.എസ് മനോജുമാർ, മാത്യുഭൂമി ബുക്സ്)
27. ദളിത് വർത്തമാനം (എഡി)രാജേഷ് ചിറ പ്ലാട്ട്,മൈത്രിബുക്സ് തിരുവനന്തപുരം
28. കാണുന്നീലൊരക്ഷരവും എം.ബി മനോജ്,ഡി.സി ബുക്സ്
29. സംസ്കാരപഠനം ചരിത്രം സിദ്ധാന്തം പ്രയോഗം മലയാളപഠനസംഘം,വള്ളത്തോൾ വിദ്യാ പീഠം
30. സംസ്കാരപഠനം രവീന്ദ്രൻ പി.പി ,ഡി.സി ബുക്സ്
31. ഇടപെടലുകൾ രവീന്ദ്രൻ പി.പി ,ഡി.സി ബുക്സ്
32. ആധുനികകാന്തരം:വിചാരം, വായന രവീന്ദ്രൻ പി.പി ,ഡി.സി ബുക്സ്
33. സാംസ്കാരികപഠനങ്ങൾ:സംസ്കാരവും നവോത്ഥാനവും പി.ഗോവിന്ദപിള്ള, ചിന്ത പബ്ലിക്കേഷൻ
34. ദേശീയതയും സാഹിത്യങ്ങളും ഇ.വി രാമകൃഷ്ണൻ
35. ദളിത് പഠനം സ്വത്വം, സംസ്കാരം, സാഹിത്യം പ്രദീപൻ പാമ്പരിക്കുന്ന്



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ചലച്ചിത്ര പഠനം

MAL5D01 ചലച്ചിത്ര പഠനം

മൊഡ്യൂൾ 1

ചലച്ചിത്രകലയുടെ ഉദ്ഭവം സാങ്കേതികത പേഴ്സിസ്റ്റൻസ് ഓഫ് വിഷൻ സ്വാധീനവും പ്രാധാന്യവും ബഹുജ നമായുമാം ജനപ്രിയസംസ്കാരവും ജനപ്രിയസിനിമയും.

മൊഡ്യൂൾ 2

സിനിമയുടെ തരം തിരിവുകൾ ഫീച്ചർ ഫിലിം, ഷോർട്ട് ഫിലിം, ഡോക്യുമെന്ററി, ആനിമേഷൻ ഫിലിം ത്രീഡി ഫിലിം ചലച്ചിത്രഭാഷ ശരീരഭാഷ നിശ്ശബ്ദ സിനിമ ബ്ലാക്ക് ആൻഡ് വൈറ്റ് സിനിമ ശബ്ദ സിനിമ കളർസിനിമ ഹൊറർ, കോമഡി, മ്യൂസിക്സ് എന്നിങ്ങനെയുള്ള തരംതിരിവുകൾ.

മൊഡ്യൂൾ 3

ഇന്ത്യൻ സിനിമ ആദ്യകാല സിനിമകൾ സത്യജിത്റേ, ഋത്വിക് ഘട്ടക്,മൃണാൾസെൻ തുടങ്ങിയവർ നടത്തിയ ബംഗാളിസിനിമയിലെ പരീക്ഷണങ്ങൾ ഗിരീഷ് കാസറവള്ളി, ശ്യാം ബെനഗൽ തുടങ്ങിയവരുടെ സിനിമകൾ. സിനിമയിലെ സ്ത്രീ പ്രതിനിധാനങ്ങൾ മീരാ നായർ, അപർണ്ണാസെൻ, ദീപമേത്ത.

മൊഡ്യൂൾ 4

തിരക്കഥാരചന അടിസ്ഥാന തത്വങ്ങൾ തിരക്കഥയിൽ നിന്ന് സിനിമയിലേക്കുള്ള മാറ്റം അനുകൽപ്പനം ചലച്ചിത്രസങ്കേതങ്ങൾ സാമാന്യപരിചയം സീൻ, ഷോട്ട്, ഫ്ലെയിം, സീക്വൻസ്, മൊഷ് എന്നിവ സംബന്ധിച്ച ധാരണ ചലച്ചിത്രനിരൂപണം ആദ്യകാല നിരൂപണങ്ങൾ സമകാലിക നിരൂപണം സമൂഹം,സംസ്കാരം, രാഷ്ട്രീയം എന്നിവയിൽ ഊന്നിയ അന്വേഷണം ആനുകാലികങ്ങളിലേയും ചലച്ചിത്ര പ്രസിദ്ധീകരണങ്ങളിലേയും നിരൂപണങ്ങൾ വിശദപഠനം തിരക്കഥ



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1. ചെമ്മീൻ
2. കാഴ്ച ബ്ലേസി

ലൈബ്രറിനെക്കോഡിലേക്ക് ചലച്ചിത്രങ്ങളുടേയും/നിരൂപണം തയ്യാറാക്കാൻ നിർദ്ദേശിക്കുന്ന സിനിമകൾ 1. സാഹിത്യത്തിലെ കഥ/കവിത എന്നിവയെ അടിസ്ഥാനമാക്കിയതോ അല്ലെങ്കിൽ സ്വതന്ത്രമായോ തയ്യാറാക്കുന്ന ഒരു തിരക്കഥ

2. ബൈബിൾതീവ്സ് സംവിധാനം വിദ്യാഭ്യാസ ഡിവിഷൻ
3. ചിത്രങ്ങൾ ഓഫ് ഹെവൻ മജീർ മജീദി ചാരുലത സത്യജിത്റായ്
5. വാട്ടർ ദിപമേത്ത
6. ഘടശാല ഗിരീഷ് കാസറവള്ളി
7. സ്വയംവരം അടൂർ ഗോപാലകൃഷ്ണൻ
6. നിർമാല്യം എം.ടി. വാസുദേവൻനായർ
9. പിറവി ഷാജി എൻകരുൺ
10. മാൻഹോൾ വിധു വിൻസെന്റ്

സഹായക ഗ്രന്ഥങ്ങൾ

1. സിനിമയുടെ ലോകം അടൂർ ഗോപാലകൃഷ്ണൻ, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്
2. സിനിമയും പ്രത്യയശാസ്ത്രവും ജോസഫ് വി.കെ. സാംസ്കാരിക പ്രസിദ്ധീകരണ വകുപ്പ്, തിരുവനന്തപുരം
3. ചലച്ചിത്രഭാഷ ജോസഫ് ഡിഗോൾ, കറന്റ് ബുക്സ്, കോട്ടയം
4. സിനിമയെ കൈത്തൽ തോമസ് എം.എഫ്. കറന്റ് ബുക്സ്, കോട്ടയം.
5. സിനിമയുടെ ആത്മാവ് തോമസ് എം.എഫ് ഡി.സി.ബുക്സ്, കോട്ടയം
6. ഇന്ത്യൻ സിനിമ തോമസ് എം.എഫ്. ഡി.സി.ബുക്സ് കോട്ടയം
7. അഭിനയം, അനുഭവം ഭരത്ഗോപി, പി.കെ. ബ്രദേഴ്സ്, കോഴിക്കോട്
8. ചലച്ചിത്ര സ്വരൂപം മാത്യു മണർക്കാട്. കറന്റ് ബുക്സ്, കോട്ടയം
9. സിനിമയുടെ രാഷ്ട്രീയം ബോധി പബ്ലിഷിംഗ്ഹൗസ്, കോഴിക്കോട്
10. കാഴ്ചയുടെ അശാന്തി രാജകൃഷ്ണൻവി. കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്



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11. ചലച്ചിത്ര സമീക്ഷ വിജയകൃഷ്ണൻ, കറന്റ് ബുക്സ്,കോട്ടയം
12. ചലച്ചിത്രത്തിന്റെ പൊരുൾ വിജയകൃഷ്ണൻ, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്
13. മലയാള സിനിമയുടെ കഥ കേരള ഫിലിം ഡവലപ്മെന്റ് കോർപ്പറേഷൻ, തിരുവനന്തപുരം, 1997
14. സിനിമയും സമൂഹവും കെ. വേലപ്പൻ, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്
15. മലയാള സിനിമ ഇന്നലെ ഇന്ന് സുന്ദരേശൻ വി. പ്രഭാത ബുക്സ് ഹൗസ്, തിരുവനന്തപുരം.
16. മലയാളസിനിമയും സാഹിത്യവും മധു ഇറവങ്കര
17. മലയാള സിനിമ സിനിക്,മംഗളോദയം, തൃശ്ശൂർ
18. സിനിമയും മലയാളിയുടെ ജീവിതവും ജി.പി.രാമചന്ദ്രൻ, എസ്.പി.സി.എസ്.കോട്ടയം, 1998
കഥയും തിരക്കഥയും ആർ.വി.എം.ദിവാകരൻ
20. തിരക്കഥാരചന കലയും സിദ്ധാന്തവും ജോസ് കെ. മാനുവൽ
21. വിശ്വേതരതിരക്കഥകൾ വിജയകൃഷ്ണൻ
22. മലയാള തിരക്കഥ വളർച്ചയും വർത്തമാനവും ആർ.വി.എം. ദിവാകരൻ, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്, തിരുവനന്തപുരം
23. പഥേർ പാഞ്ചാലി, വി.വ. ബാബുശങ്കർ, സത്യജിത് റായ് കോഴിക്കോട്, പാപിറസ്,2000
24. മൊഷ് പാഠവും പഠനവും നീലൻ മാത്യുഭൂമി, കോഴിക്കോട്, 2006
25. തിരക്കഥ സിനിമയുടെ ഡ്യൂപ്രിന്റ് അരവിന്ദൻ, വല്ലച്ചിറ, എസ്.പി.എസ്.2010
26. ഒരു സിനിമ എങ്ങനെയാകുന്നു കെ.കെ. ചന്ദ്രൻ, ചിന്ത, 2008
27. സിനിമയുടെ നീതിസാരം പി.ജി.സദാനന്ദൻ, കേരള ഭാഷാ ഇൻസ്റ്റിറ്റ്യൂട്ട്, 2006
28. ലോകസിനിമയുടെ ചരിത്രം ചേലങ്ങാട്ടുഗോരാലകൃഷ്ണൻ, കറന്റ് ബുക്സ്,തൃശ്ശൂർ, 2013
29. സിനിമ വീഡിയോ ടെക്നീക് ഡോ. മുരളീകൃഷ്ണ ഡി.സി.ബുക്സ്, 2006
30. തിരക്കഥ സിനിമയുടെ ദൃശ്യപ്രകാശം ഡോ. ഡൊമിനിക, ജെ. കാട്ടൂർ, കറന്റ് ബുക്സ്,2011



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31. സിനിമയുടെ പാഠങ്ങൾ വിശകലനവും വീക്ഷണവും ജോസ് കെ. മാനുവൽ, കറന്റ് ബുക്സ്, കോട്ടയം
32. സിനിമയുടെ വ്യാകരണം ടി. ജിതേഷ്, ഒലീവ്, 2008
33. മലയാള സിനിമ പഠനങ്ങൾ സി.എസ്. വെങ്കിടേശ്വരൻ, ഡി.സി.ബുക്സ്, 2011



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Health And Fitness Management

CC19UBPE4T21 Health And Fitness Management

Module 1: Health And Fitness Management

- i. Factors influencing healthy life
- ii. Occupational health
- iii. Life style diseases

Module 2: Energy requirements

- i. Caloric values of food
- ii. Assessment of calorie expenditure
- iii. Recommended nutritional intake
- iv. Nutritional need for different age groups
- v. Sports drinks and other fluid intake

Module 3: Client Approach

- i. Principles and factors of designing exercise programme
- ii. Designing prescription of exercise programmer for :
 1. Active population
 2. Differently abled
 3. Senior citizens
 4. Women during their pre and post natal periods
 5. Weight loss
 6. Type II diabetics
- iii. Relaxation Techniques

Module 4 : Establishment and Management of Fitness Centre

- i. Layout of health club/fitness centre
- ii. Procurement of equipment
- iii. Equipment for :
 - A. Strength training
 - B. Cardio



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C. Recovery unit

1. Equipment management
 - a. Operation
 - b. Maintenance
 - c. Repair

Module 5: Introduction to Fitness and Wellness

- a. Definition, Concept and need of fitness and wellness
- b. Dimensions of fitness
- c. Components of fitness and wellness
- d. Relationship between health, fitness and wellness
- e. Contemporary concept of Fitness and wellness

Module 6: Factors influencing fitness

- d. Anatomical fitness
- e. Physiological fitness
- f. Psychological fitness
- g. Sociological fitness
- h. Environmental fitness

Module 7: Methods to develop fitness components

- a. Aerobic
- b. Anaerobic
- c. Functional

Module 8: Nutrition and health

- a. Work, power, energy and its units
- b. Sources of energy
- c. Micronutrients
- d. Food pyramid
- e. Balanced diet

REFERENCE:



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1. Carl Evans Platt, Health and Fitness Centres, Fitman Publishing, Long Acre London
2. Parks and Znager, Sports and Fitness Management, Human Kinetics, Champain, illinois
3. Patton, Grantham Gerson and Gegtman, Developing and Management Health & Fitness Facilities
4. Neilsol& Carl Foster ACSMS Health/ Fitness Facility Standards and Guidelines, Human kinetics Books, Champain, Illinois
5. Carl Evans Platt, Health and Fitness Centres, Fitman Publishing, Long Acre London
6. Parks and Zarger, Sports and Fitness Management, Human Kinetics, Champain, Illinois
7. Patton, Grantham Gerson and Getman, Developing and Managing Health & Fitness Facilities
8. Neilsol& Carl Foster ACSMS Health/ Fitness Facility Standards and Guidelines, Human Kinetics Books, Champain ,Illinois

Foundation Of Physical Education

CC19UBPE2T8 Foundation of Physical Education

Module 1 Introduction To Education

Meaning aims, scope, nature of education. Types of education. Agencies of education and their roles; Role of education in National Integration and International relations.

Module 2

Aim and objectives of physical education. Meaning, aim and objectives, scope, nature of physical education, meaning of principles and their applications; Relationship between aims and objectives of physical education with education. objectives of physical education at different educational levels; Physical education as an athletic science : a body of knowledge as an art and science.

Module 3 Philosophical Principles

Philosophy, its meaning and nature, Educational philosophies as applied to physical education. Naturalism, Idealism, Pragmatism, Relation, Existentialism, curriculum, role of philosophy in educational and physical education; Contributions of the following educational philosophers – Rousseau Froebel, Montessori, Dewey, Gandhi & Tagore.

Module 4 Biological Principles

Evolution of man; biped position, its advantages and disadvantages; Activities as the physical basis of life ; Individual differences : **heredity and environment, sex differences**, body types, implication of individual, differences in physical education; Growth and development ;Principles governing physical and motor growth and development ; Chronological, anatomical, physiological and mental ages in individuals their role in developing and implementing programme of physical education



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Module 5 Sociological Principles

Physical activities (Games and Sports) as man's cultural heritage; Physical education as a factor in socialization of individuals and groups ; role in national integration; Brief description of theories of play. Role of physical education in context to social problems-unemployment, youth unrest, health related problems, mechanization, introduction to social stratification and sports.

Module 6 Recreation

Definition, characteristics, leisure, objective and misconception. Agencies providing recreation in India-Govt, Private, Voluntary commercial. Criteria and principles for community recreation. Recreational programme of : **Special groups- physically and mentally handicapped**; Industrial workers ; senior citizens, rural and urban population. Financing community recreation

Module 7

Recent trends and problems in physical education; professional preparation in Leadership. Concept about sports for masses and physical education at grass root level.

REFERENCE:

1. Bhatia and Bhatia, Theory and Principles of Education, Delhi, Daba House, Book Sellers and Publishers , 1986.
2. Walia J.S. Principles and Methods of education. Jallander, Paul Publishers, 1985.
3. Agarwal J.C. Theory and Principles of Education, Philosophical and Sociological Bases of education: New Delhi, Vikas Publishing House, Pvt.Ltd. 1987.
4. Kamlesh. M.L. Physical Education Facts and Foundation Faridabad P.R. Publication Pvt.Ltd. 1988.
5. Bucher Charles. A . And WuestDeboraha, Foundations of Physical Education and Sports. 10thEdn. St. Louis, Times Mirror Mosby College Publishing ,1987.
6. Barrow Harold M, Man and Movement: Principles of Physical Education. Third Edn: Philadelphia, Lea and Febiger, 1983.

Educational and Sport Psychology

CC19UBPE2T9 Educational and Sport Psychology

Module I

Definition, Meaning and Nature of Psychology: psychology as a Science. Branches of psychology ; Sport Psychology – an emerging discipline.

Module 2



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Role of Psychology in building up theory and practices in education, physical Education and sports; Important methods of Psychology (Observation, Introspection, Experimentation, Testing, Case Study etc.

Module 3

The concept of Mind (Cognition, Affection and Conation); A brief description of the characteristics and powers of mind. Conscious unconscious , sub conscious and super conscious , stages of Mind Psychological unity of the human organism.

Module 4

Growth and Development : General Principles; Factors affecting growth; stages of growth and development (Infancy, childhood, adolescence) with special emphasis on perceptual sensory, cognitive, motor, moral, physical, social and emotional characteristics; Maximizing development effects through exercise and support.

Module 5

Learning : Meaning ,Nature and principles of learning, Traditional theories of learning (Trial and Error, Conditional Reflex, Learning by Insight Learning by Imitation(; Laws of Learning (Readiness Effect, Exercise); Learning curve and its characteristics; Transfer of learning and training, its types conditions of transfer of training.

Module 6

Motivation and performance : Meaning of Motivation; Motives unlearned(innate) and learned (acquired) motives, Drive, Need, Motive ; Incentive and achievement motivation; sustaining motivation in exercise and sport.

Module 7

Personality; Meaning and structure of personality, influence of genetics and environmental factors in personality development. Personality traits of sports persons. Individual differences and their impact of learning and performance.

Module 8

Guidance and Group Work : Meaning, Definition, Need and purpose of guidance; Counselling ,Team Cohesion, Leadership in group work.

REFERENCES :

- Gratty, B.J. Psychology in Contemporary Sport. (Third Edititon); Prentic Hall, NJ (1969)
- Kamlesh, M.L. psychology in Physical Education and sports (second Edition), New Delhi Metropolitan Book Co. (1989)



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- Mangal, S.K. : Psychology An Introduction to Human Behavior New Delhi, Sterling Publishers Pvt. Ltd
- Bhatia, K.K. and Purohit, Trinath : Educational Psychology and Methods of teaching (Second Edition) New Delhi;Kalyani Publishers, (1985)
- Crow, L.D. and Crow, A: Introduction to Guidance New Delhi :Euroasia Publishing House.
- Jones A.J. Principles of guidance , Newyork (fifth Edition) MC

Tests and Measurement in Physical Education

CC19UBPE3T14 Tests and Measurement in Physical Education

Module 1

- Meaning of the terms test, measurement, evolution and statistics.
- Need and importance of test, measurement and statistics in physical education
- Meaning of terms population and sampling, importance and principles of sampling, Techniques of sampling (Random, Stratified, Cluster and systematic sampling)

Module II

- Meaning of Single Score and quantitative data; kinds of data – continuous and discrete
- Construction of frequency tables
- Measures of central tendency – mean, median and mode- meaning and uses
- Measure of variability – range, quartile deviation and standard deviation meaning and its use
- Percentiles and quartiles – meaning, uses and calculations
- Graphical representation of data frequency polygon, cumulative frequency polygon, smoothed polygon or give and bar diagrams and pie diagrams

Module III

- Criteria for test selection
 - Scientific authenticity of technical standards (reliability, Validity, objectivity, norms)
 - Administrative feasibility or economy
 - Developmental values (Physical, Social).
- Administration of testing programme
 - Advanced preparation
 - Duties during testing.
 - Duties after testing



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Module IV

1. Anthropometric measurements. History and importance. Techniques of taking measurements
 - a. Weight
 - b. Height
 - c. Arm length
 - d. Leg length
 - e. Chest Circumference
 - f. Upper arm girth
 - g. Calf girth.
2. Classification - purposes and values, factors to be kept in mind for classification, general method of classification. Classification Indicates (McCloy’s Nelson and Cozen’s Thirunarayanan and Hariharan)
3. Somatotyping: Kretclmer and Scheldon’s body types and their characteristics.

Module V

1. Concept of physical fitness and general motor ability.
2. Measurement of fitness components.
 - a. Muscular strength (isometric, isotonic and isokinetic)
 - b. Muscular endurance (sit ups, pull ups)
 - c. Cardio- respiratory endurance (harward step test, coopers 12 min. run/ walk test)
 - d. Agility (Shuttle run, squat trust)
 - e. Speed (50m. dash, 4 sec. dash)
 - f. Flexibility (Sit and reach goniometry)
 - g. Power (Medicine ball throw, vertical jump standing broad Jump)
 - h. Balance (Stock Stand)

Module VI

1. Fitness tests
 - a. Rogers physical fitness index battery
 - b. Aahperd Youth Fitness Test
 - c. Indiana Motor Fitness Test
 - d. J.C.R. Test
 - e. Kraus- Weber Test
2. Sports skill test
 - a. Lockhart and McPhersons badminton test
 - b. Johnson Basketball ability test



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- c. McDonalad Soccer test
- d. Broer Miller Tennis test
- e. Brady Volleyball test
- f. Dribbling and goal shooting test in hockey

Module VII

1. Selected (Snellan’s Chart)

- a. Vision (Snellan’s chart)
- b. Vital capacity (spirometer)

2. Nutritional Status

- a. Measurement of nutritional status (subjective and objective method), age, height, weight table, skin fold measures

3. Social efficiency meaning and importance BMI

- a. Mc Clays behaviour rating scale
- b. Self-concept

REFERENCES :

1. Garrett, Henry E. Stasisitics in Psychologyand Education.
2. Bombay, Vakils, Felter and Simons Ltd. 1981.
3. Mangal, S.K. Statistics in Psychology and Education, New Delhi, Tata Mc Grew Hill publishing Company Limited, 1987.
4. Clarke, H. Harrison and Clarke. David H. Application of Measurement to Physical Education. 6th edition Englewood Cliffs, N.J. Prentice Hall Inc. 1987.
5. Johnson Barry L. and Nelson Jack K. Practical Measurements for Evaluation in Physical Education. Delhi :Surjeet Publications 1982.
6. Mathews Donald K. Measurement in Physical Education. London W.B. Saunders Company 1973.

Sociology and Sociology of sports

CC15UBPET3 Sociology and Sociology of sports

MODULE I

Sociology and it prejudice s basic concepts :

Nature, scope and methods of sociology,

Society, Community, associations, institutions, customs and folkways, values and norms



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Biological factors – **Role of heredity environment, race prejudice**

MODULE II

Main features of Indian Society :

Religious pluralism (Hinduism ,Islam Christianity)

Linguistic Pluralism

Indian Policy – Secularism, Democracy, Social Justice.

Socialization, Nature and techniques of social control and their social consequences.

Groups – Primary and Secondary crowds and publics; Family kinship and

Marriage, social stratification, class and caste

MODULE III

Origin of the Community and Origin and growth of culture, **individual and culture**

Culture and civilization.

MODULE IV

Concept of personality, and influence of group and culture in its formation

MODULE V

Social and cultural change : concept and factors of social change, sports as social

Phenomenon and a cultural product : Sports and Socialization.

MODULE VI

Social organization and disorganization. Characteristics of social disorganization;

Distinction between Social organization and disorganization; Causes of social disorganisation

MODULE VII

Introduction to sports sociology

Nature and scope, Aim, **Values of sports in the society, Influence of society**

On sports and vice-versa. Sports and Mass Media, Sports and Politics, Socio-economic factors in sports.

REFERENCE BOOKS

1. Iver M.C. Society, London : MC Millan Co. 1962



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Oghburn, William F and Ninkoff, Meyer F, Hand Book of Sociology, New Delhi Eurasis Publishing House 1964.
- Mukherjee D.P.Sociology and Indian Culture: Jaipur. Rawat publications, 1979
- DASAT.A.R. Rural Sociology in India.Bombay : Popular Prakashan Private Ltd. 1969
- Loy Jr. John W. Kenyon, Gerald and Mcpherson, Barry S. Sports Culture And Society. Philadelphia – Lea and Febiger, 1968.
- Phonmaryoy N.I. Sports and Society. Moscow : Progress Publishers 198

Management Of Physical Education and Sports

CC15UBPE4T18 Management of Physical Education And Sports

MODULE I – THE MANAGEMENT PROCESS

Meaning, Importance and Scope of Management in Physical Education and sports. Major Management functions, theories and style of leadership

MODULE II MANAGEMENT STRUCTURES FOR PHYSICAL EDUCATION AND SPORTS PROGRAM

The organization and structure of Physical Education and sport at school, college, University, district and state level

Principles and guidance for management organisation and structure

MODULE III – FACILITY MANAGEMENT

Play fields – Location, area standard, preparation, layout and maintenance Gymnasium – Construction, allied, facilities, care and maintenance

Swimming Pool – Construction, Dimensions, marking, filtration and

Supervision of pool



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

MODULE IV – EQUIPMENT MANAGEMENT

Need and Importance, list of equipment's, types of equipment, criteria Of selection, procedure of purchase, store keeping and storing, care and Maintenance, repair and disposal, improvisation of equipment.

MODULE V – PHYSICAL EDUCATION PERSONAL AND STUDENT LEADERSHIP

Principles of personal management, personal recruitment and selection, Characteristics of physical education teachers and staff cooperation; student leadership Leadership, Educational importance selection training and recognition of students leader

MODULE VI – BUDGETING AND OFFICE MANAGEMENT

Importance of financial management, the physical education budget – Source of financial support; Accounting and petty cash, Importance of Efficiency management, office functions and practices

MODULE VII – TIME TABLE AND CLASS MANAGEMENT

Need and importance of time table in physical Education, factors affecting time table physical education programme and routine functions; effective Class management, Planning and preparation, checking attendance and Records.

MODULE VIII – PROGRAMME MANAGEMENT

INTRAMURALS : Objective of intramurals, organization of intramurals, Units of competition; the programme of activities, prizes and incentives.
EXTRAMURALS : Objectives of extramural s, principles of Interinstitutional competitions; management personal of external Programme.

MODULE IX – PUBLIC RELATIONS IN PHYSICAL EDUCATION

Importance, principles of public relation; public relation Technique and media.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

MODULE X – SUPERVISION OF PHYSICAL EDUCATION AND SPORT

Definition, **scope and principles of supervision, changing concept of Supervision, techniques of supervision.**

BOOKS RECOMMENDED

1. Charles A. Bucker, Management of Physical Education and Athletic Programmes, St. Louis, C.V. Mosby Co. 1987.
2. E. Voltmer, A. Esslinger, B.F. McCua and K.G. Tillman, The Organisation and administration of Physical Education Englewood Cliffs, Prentice Hell Inc. 1979.
3. Harold J. Vander Zwag, Sports Management in Schools and Colleges, New York Macmillan Publishing Co. 1984.
3. Dr. S. Dheer and Radhika Kamala, Organization and Administration of Physical Education, N. Delhi, Friends Publications 1991.
4. Forsyth and Duncan Administration of physical education New York Prentice Hall, Inc. 1951.
5. P.M. Joseph, Organization of Physical Education O.S.A.T. I.P.E. Kandivali Bombay, 1956.
6. Charles. A. Busher, Administration of Physical Education and Athletic Programmes, St. Louis, The C.V. Mosby Co. 1975.
7. Hughes and French, Administration of Physical Education New York Ronald Press Co. 1954.

Sports Medicine

CC19UBPE3T16 Sports Medicine

Module 1:

- i. History and development of Sports Medicine.
- ii. Aims and objectives of sports Medicine.
- iii. Need and Importance of Sports Medicine.
- iv. Scope of sports Medicine.

Module 2:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- i. Types of injuries in sports:
- ii. Skin injuries: Abrasions, lacerations, Incisions, puncture wounds, blisters, sunburn.
- iii. Bone injuries: Fractures, Dislocations.
- iv. Soft tissue injuries: Contusions, strains, sprains, overuse injuries

Module 3:

- i. **General principles of management of: Cardiopulmonary emergencies**, head and neck injuries, shock, internal injuries, superficial bleeding, fractures, dislocations.
- ii. Prevention of sports injuries.
- iii. **First aid in sports injuries.**

Module 4:

- i. Therapeutic modalities in sports medicine: Physiological effects of heat and cold.
- ii. Brief description of procedure, indications and contraindications of infrared, paraffin Wax, Whirlpool, short wave diathermy, ultrasound, I/R Lamp, microwave diathermy, TENS unit, ice.

Module 5:

- i. Brief understanding of the following regional injuries, their assessment, immediate Management and rehabilitation: Head injuries types: Scalp injuries, concussion, fracture, intra cranial bleeding, on field evaluation and management of unconscious athlete.
- ii. Shoulder girdle injuries: Fracture Clavicle, Acromioclavicular joint sprain.
Shoulder joint: Dislocations, rehabilitation of dislocated shoulder, impingement syndrome.
- iii. Elbow: Tennis elbow- rehabilitation.
- iv. Spine injuries: On field evaluation, transportation of spine injured athletes.
- v. Low back pain: Prevention of low backache. Brief understanding of rehabilitation
- vi. Knee: Types of knee injuries, Brief understanding of rehabilitation after dislocation patella and internal derangement knee.
- vii. Thigh injuries: Quadriceps contusion, strain hamstring strain rehabilitation.
- viii. Leg-ankle: Causes of shin pain, Achilles tendonitis, ankle sprains, rehabilitation of Sprained ankle.

Module 6:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- i. Thermal injuries: Heat and Cold
- ii. Prevention and management of heat cramps, heat fatigue, heat exhaustion, heat stroke, Hypothermia, Frostbite, cold burns.

Module 7:

- i. Brief understanding of the special problems of the female athletes.

Module 8:

- ii. Nutrition for the athlete, proximate principles of diet, pre-game meal, sugar & fluid intake during competition, carbohydrate loading.
- iii. Meaning, definition, classification benefits of ergogenic.
- iv. Doping: Definition, classification, Hazards and its control.
- v. IOC, FIMS, WADA, NADO, RADO

REFERENCE:

1. Roy Steven and Richer Irvin. Sports Medicine, Prentice Hall. 1983.
2. Kulund Daniel. N. The Injured Athlete, Philadelphia: J. B. Lippincott Co. 1988.
3. BooherJames M. and Thibodeau Gary-A. Athletic Injury Assessment, Toronto: Mosby College Publishing.1985.
4. Hutson M. A. Sports Injuries, Oxford: Oxford University Press. 1996.
5. Kupria, Werner. Physical Therapy for Sports, Philadelphia: W.B. Saunders Com. 1995.
6. Mellion, Morris B. Sports Injuries and Athletic Problems, New Delhi: Surjeet Publications. 1996.
7. Mottram, David R. Drugs in Sports, London: Routledge. 2004.
8. Norris, Christopher M. Sports Injuries, Oxford: Butterworth Heinmann. 1997.
9. Pandey P. K. and Gupta L. C. Outline of Sports Medicine, New Delhi: Jaypee Brothers. 1987.

First Aid and Safety Education and Life Skill Education

CC19UBPE2T10 First Aid and Safety Education and Life Skill Education



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module 1

- I. Definition and purposes of First Aid
- II. Principles and Ethics of First Aid
- III. First Aid – General Procedure
- IV. First Aid Kit

Module II

- I. Wounds- Types and its management
- II. Fractures – Types and management
- III. First Aid for: Burns, Scalds, Animal bites, Snake bite, Poisoning,
- IV. Chocking and Electric shock, Heat stroke, Snow bite, Drowning
- V. CPR

Module III

- I. First Aid for specific injuries
- II. Eye, Head, Neck, Abdomen, Organs, Blisters and Burns
- III. Strain, Sprain, Contusion, Abrasion, Laceration and dislocation
- IV. Bandaging techniques
- V. Techniques of carrying injured persons

Module IV- SAFETY EDUCATION

- I. Definitions and aims of safety education
- II. Traffic safety
- III. Safety at Home – falls, fire, suffocation, poisoning by solids and liquids

Module V

- I. Recreational safety – Fishing, Swimming, Camping
- II. Safety at school – School building, school grounds laboratory
- III. Safety in Sports and Physical Education – Play fields, Gymnasium, Swimming pool



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module VI

- I. Disaster Readiness
- II. Natural disasters – Cyclone, Tsunami, Floods, Earthquakes, Hurricanes, Blizzards

Module VII - LIFE SKILL EDUCATION

- I. Sports and Socialization
- II. Physical activity and sport – Emotional Adjustment and Wellbeing
- III. Substance Abuse among Youth – Preventive Measures and Remedies
- IV. Yoga, Meditation and Relaxation
- V. Sports and Character Building
- VI. Values in Sports
- VII. Sports for World Peace and International Understanding

REFERENCE:

1. W. Wayne Worick, Safety Education –Man , his machines, and his environment, Prentice hall Inc.
2. St.John Ambulance, St. Andrew’s Ambulance Association & British RedCross, First Aid Manual, Dorling Kindersly Limited
- 3.Peggy.A. Houglum, Theraputic Exercise for muscles, Skeletal injuries.

Adapted Physical Education

CC19UBPE4T20 Adapted Physical Education

Module 1

- I. Introduction to Adapted Physical Education
- II. Definition of disabling conditions
- III. Physical Education for persons with disabilities
- IV. Benefits of physical education for students with disabilities
- V. Recreational sports opportunities



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

VI. Competition opportunities

VII. Special Olympics

VIII. Paralympics

Module 2: Classification of disability

I. Physical disabilities

II. Mental retardation

III. Visual impairment

IV. Hearing impairment

V. Behavioral disorders

VI. Characteristics and functional limitations of the above disabilities

Module 3: Adapted Physical Education Programme

I. Guiding principles of adapted physical education programme (AAHPER principle)

II. Communication with Parents

III. Parental involvement

IV. Parent Teacher association

V. Unified sports.

Module 4: Facilities and equipment for the disabled

I. Facilities for Elementary schools, Secondary schools and colleges

II. Orientation on facilities and equipment's

III. Aids for the disabled and its evaluation

IV. Facilities and equipment's for recreation and sport activities

Module 5: Rehabilitation and Welfare Programme

I. Importance of adapted programme in Rehabilitation

II. Functional rehabilitation



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- III. Psychological rehabilitation
- IV. Government welfare programme – Provision of special rights and privileges for the disabled through legislation
- V. Social welfare programme for the disabled
- VI. Mass public education/ awareness programme
- VII. Educational approach, service approach and legislative approach

REFERENCES:

1. David Auxter and Jean Pyfer, “Principles and methods of adapted Physical Education and recreation” Mosby college publishing, St. Louis
2. Athur G. Miller & James V Sullivan, “Teaching Physical Activities to impaired youth” John Wilag& Sons Inc Canada
3. Ronald W. French, & Paul J., “Special Physical Education”, Charles E. Merrics Publishing Co. Edinburgh, Ohio.
4. Arthur S. Daniels “Adapted Physical Education”, Harper & Row Publisher- New York
5. K.E. Park, “Preventive Social Medicine” M/s Banaraidas Bhanot Publishers Prem Nagar Jabalpur.
6. John P Winnick, Adapted physical education and sport Human Kinetics USA, 2005
7. Shekar K.C, Adapted Physical Education (khel Sahitya Kendra: New Delhi) -2005
8. Gene.A. Logan Adaptations of Muscular Activity
9. Micheal, Handbook of Adapted Physical Education Equipment and its Use
10. Luke.E. Kelly, Adapted Physical Education National Standards

Scientific Principles of Coaching

CC15UBPE3T15 Scientific Principles of Coaching

MODULE I

Meaning and definition of sports training. Qualities and qualification of a coach qualities of a champion, definition of conditioning, training and coaching, aims and objectives of sports training, principles of sports training.

MODULE II

Training load, different types of load, adaptation, super – compensation, significance of load components (volume, intensity, density, frequencies and recovery). Overload, symptoms of overload, fatigue and tackling of over load.

MODULE III



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Planning, Short term plan (school, college, District, State, University, Inter- Varsity ,National etc. Long term plan (Asian, Commonwealth, Olympic and World level); Periodization (single, double and triple) training schedule.

MODULE IV

Definition, types and Methods of physical fitness components. Training means for the development of motor abilities (Strength, Endurance, Speed, Flexibility and Coordinative abilities) Technical training - **Definition, Importance & Methods Tactical training** – Definition, Importance and methods

MODULE V

Psychological skill training of the players, pep-talks, self talk before, during and after the competition, analysis of individual, group and during the training and competition. Imagery Relaxation Technique

BOOKS RECOMMENDED:

1. Frank W. Dick, Sports Training Principles Lepus Books, London, 2nd edition.
2. Hardayal Singh, Sports Training, General Theory and Methods, NSNIS, Patiala, India, 2nd edition (1990).
3. John Bun, Scientific Principles of Coaching latest edition.
4. James G. Hay, The Biomechanics of Sports Techniques Prentice Hall International Editions, 3rd edition, 1985.
5. Dr. Dietrich Harre, Principles of Sports Training Sportverling Berlin, 1982.

Biomechanics

CC15UBPE4T19 - Biomechanics

Module I - INTRODUCTION

Definition of biomechanics

Importance of biomechanics in physical education and sports

Module II- APPLICATION OF MECHANICAL CONCEPTS FORCE

Definition of force

Principles of force application

Principles of force absorption

Motion

Definition of motion

Types of motion



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Newton's laws of motion and their application in sports.

Module III - AERODYNAMICS

Projectile

Definition of projectile

Factors influencing trajectory of projectile

Optimum conditions of projection

Spin

Definition of spin

Types of spin

Effect of spin on a ball moving through air

Effect of spin on a ball rebounding from surface

Module IV - LEVER

Definition of lever

Classes of lever

Arithmetical levers

Angle of pull

Module V - EQUILIBRIUM

Definition of equilibrium

Types of equilibrium

Factors affecting equilibrium

Role of equilibrium in sports

Buoyancy

Centre of Gravity

Module VI - MECHANICAL ANALYSIS

Walking

Running

Jumping

Throwing

Striking

BOOKS RECOMMENDED:

1. Broer, M.R. Efficiency of human movement (Philadelphia: W.B. Saunders Co., 1969)
2. Ramesh and Burke Kinesiology and applied Anatomy (Philadelphia : LeaandFibger, 1967)



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

3. Marlene J. Adrian and John M. Cooper, Biomechanics of Human Movement Brown & Benchmark Publishers, Iowa, 1995
4. Gerry Carr, Mechanics of sport Human kinetics, 1997

Teaching Methods in Physical Education

CC19UBPE2T6 Teaching Methods in Physical Education

Module I

Meaning and scope of methods , Factors Influence the methods of teaching, Formal and informal methods of teaching, basic and modern traits of teaching ; Differences in class room teaching and teaching on the ground, teaching and Learning process.

Module II

Age and sex characteristics, pre-school, primary, middle secondary, higher Secondary and college levels; activity planning according to age and sex; Influence of sex differences in teaching and learning physical, physiological and Sociological needs.

Module III

Principles of teaching –Simple Complex learning, Individual and group Motivation, feedback in learning, manner, materials, capacity of the learning

Frequency administration of teaching period recognition of learning and reinforcement classification of students.

Module IV

Methods of teaching physical activities; Calisthenics, rhythmic, aerobics, dances, light apparatus, gymnastics
Individual and dual sports, Lead up games, Minor Games, major Games, mass activities.

Module V



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Presentation technique- steps in teaching motor skills, commands and their importance,
Types of class formation in teaching and learning process, class management, a good class management.

Module VI

Lesson planning- importance and objectives, various facets of lesson plan
teaching and coaching lesson plan in physical education, evaluation of general and specific lesson plan.

Module VII

Audio-visual aid, gadgets in teaching physical activities, need and importance,
Criteria/steps in selecting teaching aid, Their purchase and maintenance.

Module VIII

Dimensions and meaning of sports and games areas (track and field, major Games)
Tournament and competition in knockout, league/round robin, combination and challenge systems,
organisation and conduct of competition, tournament in individual, dual and team games and sports,
mass competition.

Module IX

Qualities of an ideal and successful teacher, Evaluation of teaching methods and learning procedures ,
modification and innovations in teaching.

Module X

Qualities of an ideal and successful teacher, evaluation of teaching methods and learning procedures,
creativity, modification and innovations in teaching.

References

- Tirunarayan c Hariharan s. Methods in Physical Education South India press Karaikudi 1986.
- Charles A buchar and constance R koening methods and materials for secondary school physical education. The c v Mosby company Saint Louis (1978)
- Linus G Dowell. Strategies for teaching physical education Prention hal 1975
- S k kochhar Methods of technique of teaching Sterling publishers pvy 1985
- ML Kamlesh and MS sangral.Methods in Physical Education Prakash brothers ludhiana 1985
- Bucher and wuest foundations of physical education and sports. Time mirror/Mosby 1985



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Judith E Rink Teaching physical education and learning. Time mirror/Mosby 1985
- Arthur G Miller and James S Sullivan teaching physical activities to impaired youth John and willy and sons 1982

Health Education

CC19UBPE3T13 Health Education

Module I - HEALTH

Definition of Health, Dimension of Health, Determinations of Health, Spectrum of Health

Module II - DISEASE

Disease cycle, Epidemiological triad, Methods of disease transmission, Immunity.

Module III - HEALTH EDUCATION

Definition of Health Education, Principles of health Education, Practice of Health Education.

Module IV - HYGIENE

Concept of Hygiene, Care of hair, Care of mouth, Care of eyes, Care of ears, Importance of rest, sleep and exercise.

Module V - COMMUNITY HEALTH

Sources of water, Sanitary well, methods of water purification, Disposal of garbage, Sanitary latrine, Septic tank, Sewage treatment

Module VI - NUTRITION

Classification of food, Proximate principles of diet – Carbohydrates, Fats, Proteins, Important sources and functions of Vitamins, Minerals, Balanced diet, Food guide pyramid

Module VII - SCHOOL HEALTH SERVICES

Importance of school health services, Health problems in the school-going child, Brief description of role of school health services- Health appraisal, Nutritional services, Mental health, Playfield safety, First aid.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Module VIII

International and National Health Organization and agencies

REFERENCES

1. J.E.Park, K. park – Text book of preventive and social medicine, BanasidasBhanot publishers, Jabalpur, Jabalpur ,1985
2. J.E. Park, K. Park, Text book of Community Health for Nurses, Asrani Publishers, Jabalpur, 1982

ENVIRONMENTAL STUDIES

Module 1:

The multidisciplinary nature of environmental studies Definition, Scope and importance, Need for public awareness.

Module II :Natural resources and associated problems.

- a.Forest resources
- b. Water resources
- c.Mineral resources
- d. Food resources
- e.Energy resources
- f. Land resources

Module III : Ecosystem

Concept of an ecosystem, structure and function of an ecosystem, Producers, consumers and decomposers, Energy flow in the ecosystem. Food chains, food webs and ecological pyramids. Introduction, types, characteristics features, structure and function of the following ecosystems.

- a. Forest ecosystem
- b. Grassland ecosystem
- c. Desert ecosystem
- d. Aquatic ecosystem

Module IV : Biodiversity and its conservation

Introduction – Definition : genetic and ecosystem diversity. Biodiversity at global, national and local levels. Threats to Biodiversity : habits loss, poaching of wildlife, man wildlife conflicts

Module V : Environmental Pollution

Causes, effects and control measures of:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- a. Air pollution
- b. Water pollution
- c. Soli pollution
- d. Marine pollution
- e. Noise pollution

Module VI : Social issues and the Environment

Water conservation, rain water harvesting, watershed management. Resettlement and rehabilitation of people, its problems and concerns. Climate change, global warning, acid rain, ozone layer depletion, nuclear accidents and holocaust. Wasteland reclamation, Consumerism and waste products, Public awareness.

Module VII : Human population and the environment

Population growth, variation among nations, population explosion – family welfare programmes
Environmental human health.

REFERENCES

1. Agrawal, K.C. Environmental Biology (Bikaner : Nidhi Publishers Ltd.) 2001
- 2C. unningham, W.P., and others. Environmental Encyclopedia (Mumbai :Jaico Publishers Home) 2001.
3. Hawakins, R.E. Encyclopedia of Indian Natural History (Bombay : Natural History Society)
4. Heywood, V.H. and Watson V.M., Global biodiversity Assessment (U.K : Cambridge University Press), 1995.

ENGLISH

Module –I

1. Vocabulary
 - 1.1 Synonyms
 - 1.2 Antonyms
 - 1.3 Common abbreviations in use
 - 1.4 One Word Se4ubstitution
 - 1.5 Words Commonly Confused and Misused
 - 1.6 Similes
 - 1.7 Word Formation by Prefix and Suffix
 - 1.8 Idioms and Phrases

Module -II

2. Common Errors & Transformations



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

2.1 Common errors in sentences especially regarding number, **gender**, pronouns, prepositions, articles degrees

2.2 Kinds of sentences – Assertive, Interrogative, Exclamatory, Imperative, Optative

2.3 Transformation of Sentences

2.4 Tenses

2.5 Uses of Tenses

Module –III

3. Grammar

3.1 Sequences of Tenses

3.2 Direct, Indirect

3.3 Active, Passive

3.4 Simple, Compound, Complex

3.5 Punctuation

Module – IV

4. Written Composition

4.1 Story – Writing (Outline Story)

4.2 Comprehension

4.3 Expansion of Proverbs and Passages

Module V

5. Correspondence

5.1 Personal Letters

5.2 Applications for leave, scholarship etc.

5.3 Invitations – Formal and informal with reply

5.4 Notice Writing

5.5 **Social Letters**

Module VI

6. Descriptive Writing

6.1 Paragraph Writing (50 words)

6.2 Essay Writing (250 words)

6.3 Essay Writing (500 words)

6.4 Summary Writing

Module VII

7. Comprehension of familiar & unfamiliar passages



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- 7.1 Comprehension of familiar passage
- 7.2 Comprehension of unfamiliar passage
- 7.3 Précis writing
- 7.4 Critical appreciation based on various articles

REFERENCES:

High School English Grammar – Wren & Martin
 How to Write & Speak better English – John Elisson Kahn, D.Philip
 A Remedial English grammar for foreign students – F.T. wood
 English Vocabulary in use – Michael McCarthy, Felicity O’Dell
 Advanced English Grammar – Martin Haurings
 Common Mistakes at Intermediate, CUP – Driscoll, Liz, Cambridge
 Common Mistakes at Upper- Intermediate CUP- Tayfoor, Suzanne
 The Students companion – Wilfred D. Best
 The technique of comprehension & Précis writing – R.N. Singh – UpkarPrakashan
 Model Precise writing – H.S. Bhatia – Book Place Delhi
 English Vocabulary in use – Michael McCarthyFelicity O’Dell – Cambridge University Press

Corrective Physical Education

CC19UBPE4T17 – Corrective Physical Education (Core)

Module 1 – INTRODUCTION

Definition of corrective Physical Education history and objectives.

Module II – MESSAGE

General principles in giving messages, Classification of Message manipulation and their therapeutic uses; Stocking manipulations; Effleurage Stroking Proper; Pressure manipulation; Kneading Petrissage, Friction, Percussion;(Tapotement) Hacking, Clapping, Beating, Pounding, Shaking Manipulations; Shaking Vibration; General Centre –indications of massage-Physiological effects of massage



CRITERION	I	Curricular Aspects
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Module III - EXERCISE THERAPPY

Importance of Relaxation: Classification of therapeutic movements; passive movements – relaxed, forced, active Movements – Assisted, free, Resisted
 Isotonic Isometric, Isokinetic
 Physiological effects of active and passive movements – Manual muscle strength assessment – Progressive Resistive Exercise, Fundamental positions- Lying Sitting, Standing, Kneeling, hanging and their derived positions – techniques, advantages, disadvantages, and uses
 Organisation of corrective class (Group Therapy) and its advantages.
 Aqua Therapy
 Need and importance
 Benefits of Aqua therapy

Module IV - POSTURE AND BODY MECHANICS

Definition and concept of posture – Disadvantages of bad postures – Body types (Somato types)
 Tests of posture (Posture Evaluation) Posture Grid – IOWA Posture Test New York Posture Rating Test – Foot Impressions (Pedograph)
Examination of Knock Knees & bow legs
Types of postural deviations, their causes and corrective exercises Round shoulder, Kyphosis, Lordosis, Flat(In brief) Scoliosis(In brief) Knock knees, Bow lags, Genu recurvature flat feet

REFERENCE:

1. Adapted Physical Education and Recreation SherillClaudilethirsedn 1986, William. C. Browe Publishers IOWA , USA
2. Development and Adapted Physical Education Clarke. Harrison H. Clarke David H, Printice, INC, New Jersey,USA
3. The Principles of Exercise Therapy Gardiner Dena. M. Fourth Edn. 1981, D Bell and Hymon ltd. London



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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Kinesiology

CC19UBPE3T12 Kinesiology

Module – I Introduction

- a. Definition of kinesiology
- b. **Role of kinesiology**

Module – II Anatomical and mechanical fundamentals

- a. Fundamental and anatomical position
- b. Orientation of planes and axes of motion
- c. Fundamental joint movements
- d. Terminology of muscular attachments
- e. Structural classification of muscles
- f. Functional classification of muscles
- g. Types of muscle contractions

Module – III Physiological fundamentals

- a. Gradation of muscle contraction
- b. Reciprocal innervations and inhibition
- c. All or none law
- d. Stretch reflex

Module - IV Major characteristics of shoulder Joint, Location, attachments, and actions of muscles acting on shoulder joint.

- a. Pectoralis major
- b. Coraco brachialis
- c. Subscapularis
- d. Biceps brachii
- e. Deltoid
- f. Supra spinatus
- g. Teres minor
- h. Latissimusdorsi



CRITERION	I	Curricular Aspects
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- i. Teres major
- j. Triceps brachii

Module - V Major characteristics of shoulder girdle, location, attachments, and actions of muscles acting on shoulder girdle joint.

- a. Pectoralis major
- b. Serratus anterior
- c. Subclavius
- d. Levator Scapulae
- e. Rhomboids
- f. Trapezius.

Module - VI Major Characteristics of Elbow joint, Location, Attachments, and actions of muscles acting on elbow joint.

- a. Biceps Brachii
- b. Brachialis
- c. Brachioradialis
- d. Supinator
- e. Pronator Teres
- f. Pronator Quadratus
- g. Triceps Brachii
- h. Anconeus

Module - VII Major Characteristics of Hip Joint. Location, attachments, and actions of muscles acting on hip joint

- a. Iliopsoas
- b. Pectineus
- c. Rectus Femoris
- d. Sartorius
- e. Tensor Faciei late
- f. Adductor Brevis
- g. Adductor Longus
- h. Adductor Magnus



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- i. Gracilis
- j. Biceps Femors
- k. Semimebranosus
- l. Semitendinosus
- m. GlutiusMximus
- n. Gluteus medius
- o. GlutiusMinimus

Module - VIII Major Characteristics of Knee joint. location, attachments, and actions of muscles acting on knee joint.

- a. Rectus femoris
- b. Vastusintermedius
- c. VastusLaterails
- d. VastusMedialis
- e. Sartorius
- f. Biceps Femoris
- g. Semi membranousus
- h. Semi tendinosus
- i. Popliteus
- j. Gracilis
- k. Gastrocnemius.

Module - IX Major Characteristics of Ankle Joint, location, attachments, and actions of muscles acting on ankle joint.

- a. Tibialis Anterior
- b. Extensor Digitorum Longus
- c. Extensor HallucisLongus
- d. Soleus
- e. Flexor DigitorumLongus
- f. Flexor HallucisLongus
- g. Tibialis Posterior

REFERENCES :



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Katharine, F. Luttgens Kathryn, Kinesiology – Scientific Basis of Human motion Singapore : Mc. Graw Will International Book Company, 1984)
2. Broer, M.R. Efficiency of Human Movement (Philadelphia : W.B. Saunders Co. 1969
3. Rasch and Burke, Kinesiology and applied Anatomy (Philadelphia : Leaand Fiber, 1967)
4. James G. Hay, The Biomechanics of Sports Techniques. Prentice hall International Inc, New Jerssy 1993.
5. Roger Bartlett, Introduction to Sports Biomechanics. E& FN SponNewYork 1997
6. Gerry Carr, Mechanics of Sport Human Kinetics, 1997

History Of Physical Education

CC19UBPE1T4 History of Physical Education

Module I

Meaning need and importance of Physical Education with preference to historical perspective of education, physical education in Ancient India – Vedic period, Epic period, Pre and Post Independent India.

Module II

Physical Education in Ancient Greece, Sparta ad Athens: Pan Hellenic Festivals : Physical education in Ancient Rome, Utilitarianism, the thermae, circus, Gladiatorial combats.

Module III

Ancient Olympic Games: Origin, events, rules and values: Modern Olympic Games – Revival, Olympic oath, Olympic emblem, Olympic Flag, cavalcade of the games, Olympic motto,

Module IV

Institutions and innervations in Physical Education ;
i. Germany (Johan Basedow, Guts Muths, Fredrich Ludwig John



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(Turnverine Movement), Adolf Spiese

ii. Sweden (Per Henric Ling, Lingiad)

iii. U.S.A. (Dr. Dio Lewis; Dr. Dudley Allen Sargent. **The Turnverine Movement in America, Springfield college of P.E. Origin of modern games and recreation movement**).

iv. U.S.S.R. (Physical education in schools and Industry, The Spartakiad)

v. Japan (Before and after world war II)

Module V

Physical Education in Contemporary India : Akharas and Vyayam – Shalash and their contributions. The British Influence on P.E. in India; Physical training, Gymkhanas and sports clubs. YMCA and its contributions to P.E. Teacher’s Training Institutions in P.E. Indian Olympic Association, National Sports Federations and State Associations.

History of Physical Education in Kerala – G.V. Raja. Kalaripayattu – Boat races

Module VI

Post-Independence developments in P.E. Various Commissions and Committees in P.E. (Adhoc Enquiry Committee 1958, Kaul Kapoor Committees, CAPBE.) National Plan of P.E.; All India Council of Sports (AICS); National Physical Efficiency Drive (NPED/NPFP); national Discipline Scheme (N.D.S); National Fitness Corps (NFC); National Cadet Corps (NCC); National Social Service (NSS); National Sports Organisation (NSO)

Sports and Youth Programme : Netaji Subhas National Institute of Sports (NSNIS); Sports Authority of India (SAT) and its Schemes for promotion of Sports; Youth Welfare Programme (NYK, Youth Hostels PYKKA); National Sports Awards (Arjun Award, Dronacharya Award); Rajeev Gandhi Khel Ratna – Dhyan Chand.

Module VII

Professional Organizations of physical Education and Sports : Indian Association of Teachers of Health, Physical Education and Recreation (IATHPER); Indian Association of Sports Scientist and Physical Educationalists (IASSPE); Sports



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Physiology Association of India (SPAI) ; National Association of Physical Education and Sports (NAPES); Development of Sports Sciences; Future of Physical Education.

REFERENCE

1. Hackensmith, C. W. History of Physical Education, New York, Harper & Row Publishers, 1966.
2. Van Dalen, D.B. Bennet, B.C: A World History of Physical Education. Englewood Cliffs, N.J. Prentice Hall, Inc. 1973.
3. Arunnarayanan, C and Hariharan Sharma, S: An Analytical History of Physical Education, Karikudi (1978)
4. Khan, ErajAhamed : History of Physical Education, Patna Scientific Corporation (964).
5. Kamalesh, M.L.: Physical Education Facts and Foundations, Faridabad P.S. Publication (pvt) Ltd. (1988).
6. Annual Report of Department of Youth Affairs and Sports from Ministry of Human Resource Development, Government of India

Earth and Environment

GLO1IB01 Earth and Environment

Unit 1

Geology and its perspective

Origin of Planets- Nebular hypothesis, Planetesimal hypothesis, Gaseous-Tidal Hypothesis; Binary star Earth in relation to solar system, size, shape, mass, density and its development.

Age of the Earth – Determination of Earth’s age, - Radioactive methods and non-radioactive methods.

Plate Tectonics: The Discovery of Plate Tectonics, The Mosaic of Plates, Rates and History of Plate Motions, The Engine of Plate Tectonics. Geological Time scale: Eons; Eras; Periods; and Epochs

Unit 2



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Minerals: A brief introduction to minerals, The Atomic Structure of Minerals. Rock-Forming Minerals, Properties of Minerals.

Rocks: Types of rocks - brief introduction to Igneous, sedimentary and metamorphic rocks; Concept of rock cycle, Rock and Fossil Record

Unit 3

Brief Introduction about Folds, Faults, and other Records of Rock Deformation, Evolution of the Continents

Elementary ideas about outcrops, dip, strike, outlier, inlier and overlap

Unit 4

Natural Hazards: Volcanism, Earthquakes, Tsunamis, Landslide Issues relating to prediction, protection and mitigation. Landscape - Tectonic and Climate Interaction

Unit 5

Volcanoes – Classification based on Lava Types; Styles of Eruptions – Landforms, Products - Global Distribution; Causes; Effects; Prediction

Mountains and Classification, Isostasy – Airy Theory, Pratt Theory, Heiskanen’s Theory

Earthquakes – Properties of seismic waves; Magnitude and Intensity – Richter and Mercalli’s Scales; Seismogram and Seismograph. Origin, distribution and prediction of earthquakes. Tsunami – Origin and effects

Reference: -

Frank Press Raymond Siever: Understanding Earth (3rd ed). W.H. Freeman and Company. New York. 2000
 Skinner B. J. and Porter S.C.: The Dynamic Earth – An Introduction to Physical Geology 3rd edition. John Wiley & Sons, New York. 1995
 P. McL. D. Duff : Holme’s Principles of Physical Geology (4th ed). Chapman & Hall. London. 1996
 Cox A. & Hart R.B.: Plate Tectonics How it works. Blackwell Scientific Publ. Co. Boston. 1986.
 Philip A. Allen.: Earth Surface Processes Blackwell Sciences Ltd, Oxford. 1997
 Murck B.W., Skinner B.J & Porter S.C.: Dangerous Earth – An Introduction to Geologic Hazards John Wiley & Sons New York. 1996
 Condie, K.C.: Earth as an Evolving Planetary System, 3rd Edition, Academic Press, USA. 2015



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Marshak, S.: Earth: Portrait of a Planet. W.W. Norton & Co., Inc., USA. 2001

Tarbutk, E.J. and Lutgens, F.K.: Earth: An Introduction to Physical Geology. 9th Edition, Pearson Education, Inc., New Jersey, USA. 2008

Wicander, R. and Monroe, J.: Essentials of Geology. 4th Edition, Thomson Learning Inc., USA. 2006

Geomorphology

GLO2IB02 Geomorphology

Unit-1:

Introduction: Fundamental concepts; Cycle of erosion; Base level.

Weathering: Factors influencing weathering Types - Physical: Expansion, crystal growth, thermal expansion, organic activity, colloidal plucking. Chemical: Hydration, hydrolysis, oxidation, carbonation and solution.

Products of Weathering, Soil and Soil Profile

Mass wasting: Conditions favoring mass wasting: lithology, stratigraphy, structure, topography, climate, organism etc. Slow flowage: creep, solifluction Rapid flowage: Earthflow, Mudflow, Debris avalanche Landslides: slump, slide, fall.

Unit-2:

Running water as a geological agent: Development of a typical stream-Drainage system consequent and subsequent streams - Drainage basin- Drainage Pattern-Geological work of stream, erosional and depositional fluvial landforms, Concept of base level, Peneplanation, Monadnocks, Stream terrace, Rejuvenation, Knick Point, Entrenched meanders.

Geological work of wind. Erosional and depositional landforms. Loess, types of dunes, Pediplanation, playas and inselbergs. Formation of deserts.

Unit-3:

Glaciers- Formation of glaciers- Types- Movements-Erosional and depositional landforms, Glacier landforms, glacial ages.

Underground water: occurrence, zone of aeration & saturation, Water table, Perched watertable, porosity, permeability,

Aquifers- confined and unconfined, aquicludes, aquitard and aquifuge. Artesian wells, Geyser and springs. Erosional and depositional landscapes produced by action of ground water.

Origin of limestone caverns-Stalactite and stalagmites. Karst topography: Terra rosa, lapies, sinkholes, blind valley, caverns, stalactites and stalagmites, natural bridge, tunnel.



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Unit 4

Oceans and Seas: Waves, tides and currents. Geological work of oceans. Classification of offshore line and Coast, Shore line types
Description of continental margins, Continental Shelf-Continental slope submarine canyons- sea mount-Guyots, midocean ridges, trenches. Coral reefs – types and origin. Lakes and its types

Unit 5

Field methodologies in Geology– Topographic Maps and its uses – Instruments –Clinometer, Brunton compass, Map Symbols, Toposheets, GPS, Aerial Photographs, Satellite imageries

References: -

- Thornbury W.D. 1984, Principles of Geomorphology, First Willey Eastern Reprint, New Delhi.
Frank Press and Raymond Siever 1998, Earth (4th Edition) W.H. Freeman & Co., San Francisco.
Avery T. E and Berlin G. L, 1992, Fundamentals of remote sensing and Air photointerpretation. McMillion Publishing Co., New York.
Pitty A.F., 1971, Introduction to geomorphology, Methuen, London.
Pandey S. N. 1987 Principles and Applications of Photogeology, Wiley Eastern
Lo, C.P. and Yeung, A.K.W., 2007. Concepts and Techniques in Geographic Information Systems.
Tarbuck, E.J. and Lutgens, F.K., 2008. Earth: An Introduction to Physical Geology. 9th Edition, Pearson Education, Inc., New Jersey, USA.
Wicander, R. and Monroe, J., 2006. Essentials of Geology. 4th Edition, Thomson Learning Inc., USA.

Crystallography and Mineralogy

GLO3IB03 Crystallography and Mineralogy

Unit 1:

Crystallography – A brief introduction to scope and its applications.

Nature of crystals; crystalline and amorphous materials; polycrystalline materials; a brief introduction to Crystal systems.



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Morphological characters of crystal – faces, forms, edges solid angles Interfacial angle

Symmetry elements – crystallographic axes, crystal notation, parameter system of Weiss and Miller indices, axial ratio.

Laws of crystallography – law of constancy of symmetry, law of constancy of interfacial angles, law of rational indices.

Classification of crystals into systems and classes – Holohedral, Hemihedral, Hemimorphic and Enantiomorphic forms in crystals.

Unit 2:

Study of the symmetry elements and forms of the Normal, pyritohedral, tetrahedral and plagiohedral classes of cubic system with special reference to well-developed crystals of Galena, Spinel, Garnet, Fluorite, Diamond, Pyrite, Tetrahedrite, Boracite and cuprite.

Study of symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Sphenoidal and Trapezohedral classes of Tetragonal system.

Study of the symmetry elements and forms of Normal, Hemimorphic, Tripyramidal, Trapezohedral, Rhombohedral, Rhombohedral Hemimorphic and Trapezohedral classes of Hexagonal system.

Unit 3:

Study of the symmetry elements and forms of the Normal and Sphenoidal classes of the Orthorhombic system.

Study of the symmetry elements and forms of the Normal classes of the Monoclinic and Triclinic systems.

Twin crystals – Definitions – Effects of Twinning – laws of twinning –

composition plane, twinning plane and twinning axis, indices of twins – simple and repeated (polysynthetic twins), contact and penetration twins: secondary twins.

Unit 4.

Definition of Mineral and Mineraloid – Scope and aim of Mineralogy.

Crystal Coordination - the making of minerals

Classification and structural diversity of silicate minerals

Unit 5:

Compositional variation and coupled ionic substitution, Isomorphism, Polymorphism, Pseudomorphism, solid

solution and ex- solution in minerals. Physical properties of minerals Form, colour, streak, luster, Hardness,

Cleavage, Fracture, Specific Gravity, Tenacity, transparency, Electrical and Magnetic properties- pyro and piezo



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electricity, Ferri-, Para-, and Diamagnetism.

Reference: -

Borchardt-Ott, W: Crystallography– An Introduction. Springer Heidelberg, 355p,2011
 Dana F.S: A Text Book of Mineralogy. Asia publishing House, Wiley, 1955
 Klen C., Hurlbut C.S.: Manual of Minerology, John Wiley & Sons, 1985.
 Perkins D.:Mineralogy. Pearson Education (3Ed), 568 p,2015

Biodiversity – Scope and Relevance

CC20IA11 Biodiversity – Scope and Relevance

Unit 1 Defining Biodiversity (Hours: 12)

The concept of biodiversity. Biodiversity crisis. Importance of biodiversity in daily life. Biodiversity and climate change. India as mega biodiversity nation. Hot spots of biodiversity in India.

Unit 2 Components of Biodiversity. (Hours: 12)

Genetic diversity, species diversity and ecosystem diversity. Brief outlines of the magnitude of bacterial, fungal, protist, animal and plant diversity.

Unit 3 Loss of Biodiversity (Hours: 12)

Factors causing loss of genetic-, species- and ecosystem diversity. Processes responsible for species extinction. Threatened species and IUCN Red List categories. Loss of agrobiodiversity. Significance of wild relatives of cultivated plants and domesticated animals.

Unit 4 Values and uses of biodiversity (Hours: 12)

Ethical and aesthetic values of biodiversity. Direct and indirect economic benefits of biodiversity. Bio-prospecting – micro-organisms and plants as a source of novel enzymes, antibiotics, antiviral agents, Immunosuppressive agents and other therapeutic agents.

Unit 5 Inventorying and Monitoring of Biodiversity (Hours: 12)



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The need for inventorying and monitoring of biodiversity. Methods of inventorying and monitoring of biodiversity and their limitations.

Unit 6 Conservation of biodiversity (Hours: 12)

Conservation of genetic-, species- and ecosystem diversity. In situ and ex situ conservations: biosphere reserves, national parks, wild-life sanctuaries, gene banks, seed banks, botanical gardens, microbial culture collections.

Suggested Reading

Patent, D. H., Munnoz W. 1996. Biodiversity. Clarion Books.

Maiti, P. K., Maiti, P. 2011. Biodiversity: Perception, Peril and Preservation. Prentice Hall India.

Maclaurin, J. 2008. What is biodiversity? University of Chicago Press.

Krishnamurthy, K. V. 2003. Textbook of Biodiversity. SciencePublishers Inc.

Wilson E. O. 2010. The Diversity of Life. Harvard University Press.

Hosetti B.B., Ramkrishna, S. 2016. Biodiversity: Concepts and Conservation. Aavishkar Publishers.

Kumar A. 2011. Understanding Biodiversity. Discovery Publishing House.

Hendon, J. 2017. Textbook of Biodiversity. Syrawood Publishing House.

Adom, D. Umachandran, K., Ziarati, P., Sawicka, B., Sekyere, P. 2019. The Concept of Biodiversity and its Relevance to Mankind: A Short Review. Journal of Agriculture and Sustainability 12(2): 219-231.

Ehrlich, P.R., Ehrlich, A.H. 1992. The Value of Biodiversity. Stanford University Press.

Research Methodology

CC20IA12 Research Methodology (Theory)

Unit I (Hours: 13)

Topic selection - Planning research – defining objectives - Preparation of work plans. Identification of suitable methodology - Preparation of project proposal –Summer Schools – Training in research institutes

Unit II (Hours: 14)

Collection of literature- News articles – Newsletters – Magazines – Books - Journals. Digital library and search of articles - Keywords and search - Internet – Google Scholar – PubMed – Infilbnet – Medline – Agricola – Science direct -Open access Journals - virtual sources – other sources. Short communications –review articles Unit III (Hours: 15)



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Collection of protocols and selection of suitable methods according to work plan. Observational and experimental research. Data analysis – Construction of tables – headings - footer - Tabulation – Presentation of results - Use of statistical software to analyze the results- SPSS.

Unit IV (Hours: 15)

Thesis structure –Components - Writing Introduction – review of literature – Materials & Methods – Presentation of results – Discussion of Results based on literature – Arriving at conclusions – Preparation of Summary/abstract – Arrangement of Bibliography and how to quote reference in thesis - Appendix.

Unit V (Hours: 15)

Publishing of Articles in newspapers /newsletters - Selection of journals – ISSN Number – Peer- reviewed Journals – Science citation index – impact factor and importance. Manuscripts preparation for Journals – components – **Plagiarism - Submission and Publication – reprints and pdf formats.** Paper presentation in Conferences.

SUGGESTED READING

Anderson, Durston & Polle 1970: Thesis and assignment, writing. Wiley Eastern Limited.

Booth W. C. et al. 2016. The Craft of Research. University of Chicago Press.

Rajendrakumar C. 2008. Research Methodology. APH publishing Corporation.

Kothari C. R. 2004. Research Methodology. New Age International Publishers.

Gurumani, N. 2006. Research Methodology for Biological Sciences. MJP. Publishers.

Marczyk, G., DeMatteo, D., Festinger, D. 2005. Essentials of research design and methodology. John Wiley.

Katz, M. J. 2009. From Research to Manuscript: A Guide to Scientific Writing. Springer.

Michael Alley. The Craft of Scientific Writing (3rd Edition) Publisher: Springer.

Cargill, M., O.Connor, P. 2013. Writing Scientific Research Articles: Strategy and Steps. Wiley-Blackwell.

Blake, G. and Bly, R. W. 2000. The Elements of Technical Writing. Pearson.

Reep, D. C. 2014. Technical Writing: Principles, Strategies, and Readings. Longman.



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Optical and Descriptive Mineralogy

GLO4IB04 Optical and Descriptive Mineralogy

Unit 1:

Nature of light – Ordinary and polarized light; Refraction and reflection; Refractive index, Critical angle and Total internal reflection.

Double refraction – Plane Polarization by Reflection; Plane polarization by Refraction; Nicol Prism; Plane polarization by absorption.

Petrological microscope and its parts

Isotropic and anisotropic minerals - Optical properties.

Unit 2:

Characters of Uniaxial and biaxial minerals – Optic axis and optic axial angle; Acute and Obtuse Bisectrix; Optic sign of Uniaxial and Biaxial minerals; Uniaxial and Biaxial Indicatrix; Sign of elongation.

Extinction – Types, angles, determination, and applications in mineral identification.

Optical accessories and uses – Quartz wedge (Determination of order of Interference Colour), Gypsum plate and Mica plate (Determination of Fast and Slow vibration directions).

Unit 3:

Structure, Chemistry, Optical and Physical properties, Modes of occurrence and uses of the following groups of minerals: Olivine, Garnet, Epidote, Aluminium silicates, Pyroxene, and Amphibole.

Unit 4:

Structure, Chemistry, Optical and Physical properties, Modes of occurrence and uses of the following groups of minerals: Mica, Chlorite, Polymorph and varieties of Quartz, Feldspars, Feldspathoids and Spinel.

Unit 5:

Chemistry, Optical and Physical properties, Modes of occurrences and industrial uses of the following minerals Scapolite, Cordierite, Talc, Serpentine, Steatite, Calcite, Dolomite, Topaz, Staurolite, Beryl, Tourmaline, Fluorite, Apatite, Zircon, Rutile, Sphene, Zeolites and Corundum.

Reference :-

Dyar M.D., Gunter, M.E.: Mineralogy and Optical Mineralogy. Min. Soc. America, 705p, 2007.

Nesse W.D.: Introduction to Optical Mineralogy. Oxford University Press; 4



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
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edition, 384p, 2012.

Pichler H., Riegraf C.S.: Rock-forming Minerals in Thin Section. Springer, 220 p,2011.

Deer W.A., Howie R.A., Zussman J.: Introduction to the Rock-forming Minerals. Mineralogical Society of Great Britain & Ireland,510p, 2013

Natural Resource Management

CC20IA13 Natural Resource Management

Unit 1: Introduction to natural resources (Hours: 8)

Definition of natural resources. Types of natural resources. Need for protecting natural resources Unit 2: Sustainable utilization (Hours: 8)

Concept of sustainable utilization. Economic, ecological and socio-cultural approaches.

Unit 3: Land (Hours: 8)

Agricultural, pastoral, horticultural and silvicultural land utilization. Soil degradation and soil management.

Unit 4: Water (Hours: 8)

Fresh water (rivers, lakes, groundwater); Marine; Estuarine; Wetlands; Threats and management strategies.

Unit 5: Biological Resources (Hours: 8)

Biodiversity-definition and types; Significance; Threats; Management strategies. Bioprospecting. National Biodiversity Action Plan.

Unit 6: Forests (Hours: 8)

Definition. Types of forests. Forest cover and its significance (with special reference to India); Major and minor forest products; Forest depletion. Forest Management.

Unit 7: Energy (Hours: 8)

Renewable and non-renewable sources of energy.

Unit 8: Contemporary practices in natural resource management (Hours: 8)

Environmental Impact Assessment, Remote Sensing, Geographic Information System, Participatory Resource Appraisal. Ecological footprint with emphasis on carbon footprint. Resource Accounting. Waste management.

Unit 9:

National and international efforts in natural resource management and conservation (Hours: 8)

SUGGESTED READING



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Singh K. K. 2008. Natural Resources Conservation & Management. M D Publications Pvt. Ltd.

Singh, J. S., Singh, S.P. and Gupta, S. 2006. Ecology, Environment and Resource Conservation. Anamaya Publications.

Rogers, P.P., Jalal, K.F. and Boyd, J.A. 2008. An Introduction to Sustainable Development. Prentice Hall of India.

Pandey, B. W. 2005. Natural Resource Management. Mittal Publications.

Lynch D. R. 2011. Sustainable Natural Resource Management. Cambridge University Press.

Nuberg, I., George, B., Reid, R. 2009. Agroforestry For Natural Resource Management. CSIRO Publishing.

Camp, W. G., Heath-Camp, B. 2016. Managing Our Natural Resources. Cengage Learning Pte. Ltd

Chiras, D. D., Reganold, J. P. 2009. Natural Resource Conservation: Management for a Sustainable Future. Pearson.

Campbell, B. M., Sayer, J. A. 2003. Integrated Natural Resource Management: Linking Productivity, the Environment and Development. CABI Publishing.

Deal, K. H. 2011. Wildlife and Natural Resource Management. Delmar Cengage Learning.

Intellectual Property Rights

CC20IA14 Intellectual Property Rights

Module 1

Introduction and the need for intellectual property right (IPR). IPR in India – Genesis and Development. Some important examples of IPR.

Module 2: Patents (Hours: 10)

Macro-economic impact of the patent system. Patent and kind of inventions protected by a patent. Patent document. How to protect your inventions? Granting of patent. Rights of a patent. How extensive is patent protection? Why protect inventions by patents? Searching a patent. Drafting of a patent. Filing of a patent

Module 3: Copyright (Hours: 10)

What is copyright? What is covered by copyright? How long does copyright last? Why protect copyright? Related rights: What are related rights? Distinction between related rights and copyright. Rights covered by copyright.

Module 4: Trademarks (Hours: 14)

Definition of trademark. Rights of trademark. Kinds of signs that can be used as trademarks. Types of trademark. Function that a trademark performs. How is a trademark protected? How is a trademark registered? How long is a registered trademark



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protected for? How extensive is trademark protection? What are well-known marks and how are they protected? Domain name and how does it relate to trademarks?

Module 5: Geographical Indications (Hours: 4)

What is a geographical indication? How is a geographical indication protected? Why protect geographical indications?

Module 6: Industrial Designs (Hours: 10)

What is an industrial design? How can industrial designs be protected? What kind of protection is provided by industrial designs? How long does the protection last? Why protect industrial designs?

Module 7: Biotechnology and IPR Rationale for Intellectual Property Protection in biotechnology. Concept of Novelty in Biotechnological Inventions. Concept of Inventive Step in Biotechnological Inventions. Microorganisms as Biotechnological Inventions. Patenting biological inventions. Patenting microorganisms. Patenting other biological processes and products. Protection of new

varieties of plants. Justification for Protection. Biotechnology and International Treaties such as Convention on Biological Diversity and TRIPs. (Hours: 20)

Suggested Reading

T. M Murray, M.J. Mehlman. 2000. Encyclopaedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley & Sons.

P.N. Cheremisinoff, R.P. Ouellette and R.M. Bartholomew.1985. Biotechnology Applications and Research, Technomic Publishing Co., Inc.

D. Balasubramaniam, C.F.A. Bryce, K. Dharmalingam, J. Green and K. Jayaraman, 2002. Concepts in Biotechnology, University Press (Orient Longman Ltd.).

Bourgagaize, Jewell and Buiser. 2000. Biotechnology: Demystifying the Concepts, Wesley Longman.

Ajit Parulekar, Sarita D' Souza. 2006. Indian Patents Law – Legal & Business Implications; Macmillan India,

B.L. Wadehra. 2000. Law Relating to Patents, Trade Marks, Copyright, Designs & Geographical Indications; Universal law Publishing Pvt. Ltd.

P. Narayanan. 2010. Law of Copyright and Industrial Designs; Eastern law House.

N.S. Gopalakrishnan, T.G. Agitha. 2009. Principles of Intellectual Property. Eastern Book Company.

T. Ramakrishan (Ed.). 2003. Biotechnology and Intellectual Property Rights. CIPRA, NLSIU, Bangalore.

N.K. Acharya. 2012. Text Book on Intellectual Property Rights, 6th ed. Asia Law of Novelty in Biotechnological Inventions. Concept of Inventive Step in Biotechnological Inventions. Microorganisms as Biotechnological Inventions. Patenting biological inventions. Patenting microorganisms. Patenting other biological processes and products. Protection of new varieties of plants. Justification for Protection. Biotechnology and International Treaties such as Convention on Biological Diversity and TRIPs. (Hours: 20)



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Suggested Reading

T. M Murray, M.J. Mehlman. 2000. Encyclopaedia of Ethical, Legal and Policy issues in Biotechnology, John Wiley & Sons.

P.N. Cheremisinoff, R.P. Ouellette and R.M. Bartholomew.1985. Biotechnology Applications and Research, Technomic Publishing Co., Inc.

D. Balasubramaniam, C.F.A. Bryce, K. Dharmalingam, J. Green and K. Jayaraman, 2002. Concepts in Biotechnology, University Press (Orient Longman Ltd.).

Bourgagaize, Jewell and Buiser. 2000. Biotechnology: Demystifying the Concepts, Wesley Longman.

Ajit Parulekar, Sarita D' Souza. 2006. Indian Patents Law – Legal & Business Implications; Macmillan India,

B.L. Wadehra. 2000. Law Relating to Patents, Trade Marks, Copyright, Designs & Geographical Indications; Universal law Publishing Pvt. Ltd.

P. Narayanan. 2010. Law of Copyright and Industrial Designs; Eastern law House.

N.S. Gopalakrishnan, T.G. Agitha. 2009. Principles of Intellectual Property. Eastern Book Company.

T. Ramakrishan (Ed.). 2003. Biotechnology and Intellectual Property Rights. CIPRA, NLSIU, Bangalore.

N.K. Acharya. 2012. Text Book on Intellectual Property Rights, 6th ed. Asia Law House.

M. M. S. Karki. 2009. Intellectual Property Rights: Basic Concepts. Atlantic Publishers.

N. S. Sreenivasalu. 2007. Intellectual Property Rights. Neha Publishers & Distributors.

Pal P. 2008. Intellectual Property Rights in India: General Issues and Implications. Regal Publications

Igneous Petrology

GLO5IB05 Igneous Petrology

Unit 1:

Composition and constitution of magmas – Primary and Parental Magmas.

Forms of Intrusive igneous rocks: Concordant forms - Sill, Laccolith, Lopolith and Phacolith, Discordant forms - Dykes, Cone Sheets, Volcanic neck, Ring dyke, Batholiths, Stocks, Bosses and bysmaliths.

Forms of Extrusive igneous rocks: Lava flows, Pyroclastic deposits -Agglomerate, Lapilli, volcanic ash and volcanic froth.

Unit 2:



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Structures: vesicular and Amygdaloidal structures – block lava – Ropy lava –pillow structure – flow structure – sheet joints- mural jointing – columnar jointing – rift and grain.

Textures: Definition and description - crystallinity: crystallites and microlites –Devitrification – Granularity – shapes of crystals, mutual relations – Equigranular textures: allotriomorphic hypidiomorphic, Panidiomorphic. inequigranular Textures: porphyritic and Intergrowth texture – Trachytic texture – Intergrowth texture structures orbicular structure Spherulitic structure

– Perlitic fracture. , Directive textures, Overgrowth textures, Reaction textures

- Micro Structures

Unit 3:

Classification: bases of classification – Genetic classification – classificationbased on colour index – based on the proportion of Alkali to plagioclase feldspars-based on silica saturation – based on alumina saturation –

A short account of CIPW classification, Normative minerals, salic and femicgroups – Merits and defects of CIPW classification

Tyrrel’s tabular classification- IUGS classification.

Unit 4:

Crystallization of Unicomponent magma

Crystallization and petrogenetic significance of Binary magmas: Diopside – Anorthite Eutectic system, Albite – Anorthite Solid-Solution system, Forsterite

– Silica incongruent melting system and Ab- Or system.

Reaction principle and Bowen’s reaction series - Causes for the diversity of Igneous rocks – Magmatic Differentiation: Fractional Crystallization, Liquidimmiscibility, Assimilation

Unit 5:

Study of Texture, Mineralogy, Classification, and Modes of occurrence of Granite, Granodiorite, Syenite, Diorite, Gabbro with their hypabyssal andvolcanic equivalents.

Petrographic characters and origin of Pegmatites, Lamprophyres, Alkalinerocks, Dunite, Peridotite and Anorthosites

Reference :-

Frost, B.R., Frost, C.D., 2014. Essentials of Igneous and Metamorphic Petrology. Cambridge University Pres. 318 p.

Raymond, L.A., 2002. Petrology: The Study of Igneous, Sedimentary and Metamorphic Rocks, 720p.

Winter, J.D., 2009. Principles of Igneous and Metamorphic Petrology. Pearson, 720 p.



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Metamorphic Petrology

GLO5IB06 Metamorphic Petrology

Metamorphism – Definition; limits of metamorphism (low and high T/P limits and influence of water and bulk compositions on metamorphic limits).

Variables of metamorphism – temperature, lithostatic pressure, deviatoric stress, fluids.

Types of metamorphism – classification based on the principal agents (thermal, dynamic, dynamo-thermal, hydrothermal); based on geological setting – contact, shock, high-strain, regional (burial, ocean-ridge, orogenic); based on plate tectonic setting – metamorphism at convergent, divergent, and transform plate margins.

Fault-zone and impact metamorphism

Unit 2:

Classification of metamorphic rocks: foliated and lineated; non-foliated and non-lineated; specific rock groups (Quartzite, Greenstone, Amphibolite, Serpentinite, Calc-silicate, Skarn)

Metamorphic structures – fabric, layer, foliation, schistosity, cleavage, gneissosity, lineations.

Metamorphic textures – augen, cataclastic, corona, decussate, epitaxial, flaser, granoblastic, lepidoblastic, megacrystic, nematoblastic, poikiloblastic, porphyroblastic, strain shadow, symplectite, and relict textures.

Equilibrium mineral assemblages; Introduction to chemographic diagrams: ACF, AKF Diagrams

Unit 3:

Metamorphic grades and isograds; mineral zones and Barrovian sequence;

Metamorphic facies – zeolite, prehnite-pumpellyite, greenschist, epidote-amphibolite, amphibolite, granulite, blueschist, eclogite, and contact metamorphic facies

Facies series and plate tectonics – paired metamorphic belts.

Unit 4:

Metamorphic effects on – argillaceous (medium P-T Barrovian); calcareous (contact metamorphism); basic igneous (regional metamorphism) rocks

Petrography and origin of slate, phyllite, chlorite schist, kyanite schist, biotite schist, biotite gneiss, hornblende gneiss, amphibolite, marble, charnockite, eclogite, and mylonite

Unit 5:

Prograde and retrograde metamorphism

Nature of metamorphic fluids and metasomatism



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Anatexis and migmatites; metamorphic differentiation

References:

Barker, A.J., 1990. Introduction to Metamorphic Textures and Microstructures. Blackie, 162p.
 Bucher, K. and Grapes, R., 2011. Petrogenesis of Metamorphic Rocks. Springer-Verlag, Berlin-Heidelberg, 428p.
 Frost, C.D., Frost, B.R., 2013. Essentials of Igneous and Metamorphic Petrology, Cambridge University Press, 336p.
 Kretz, R., 1994. Metamorphic Crystallization. John Wiley & Sons, 507p.
 Miyashiro, A., 1978. Metamorphism and Metamorphic Belts. 3rd Edition. George Allen & Unwin, London, 492p.
 Vernon, R.H. and Clarke, G.L., 2008. Principles of Metamorphic Petrology. Cambridge University Press, 446p.
 Winter, J.D., 2011. Principles of Igneous and Metamorphic Petrology, Prentice-Hall, 728p.

Sedimentary Petrology

GLO5IB07 Sedimentary Petrology

Unit 1

Origin of sediments

Weathering and sedimentary flux: Physical and chemical weathering,

Soils and paleosols.

Unit 2:

Sediment granulometry, Grain size scale, particle size distribution, Environmental connotation; particle shape and Fabric

Unit 3:

Sedimentary textures, structures and environment Fluid flow, sediment transport and sedimentary structures: Types of fluids, Laminar vs. turbulent flow, Particle entrainment, transport and deposition.

Paleocurrent analysis- Paleocurrents for different sedimentary environments Sedimentary structure- Primary and syn-sedimentary structures

Unit 4:

Varieties of sedimentary rocks

Siliciclastic rocks: Conglomerates, sandstones and its classification, mudrocks.



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Carbonate rocks, controls of carbonate deposition, components and classification of limestone, dolomite and dolomitisation

Unit 5:

Diagenesis Concepts of diagenesis Stages of diagenesis Compaction and cementation.

References

Prothero, D. R., & Schwab, F. 2004. Sedimentary geology. Macmillan.
 Tucker, M. E. 2006 Sedimentary Petrology, Blackwell Publishing.
 Collinson, J. D. & Thompson, D. B. 1988 Sedimentary structures, Unwin- Hyman, London.
 Nichols, G. 2009. Sedimentology and Stratigraphy Second Edition. Wiley Blackwell

Structural Geology and Geotectonic

GLO5IB08 Structural Geology and Geotectonic

Unit-1

Concept of force and stress. Normal stress and shear Stress. Stress components. Hydrostatic and deviatoric stresses. Concept of strain. Nature of strain. Pure shear and simple shear. Concept of strain ellipsoid. Behaviour of materials under stress.
 Concept of deformation. Elastic and plastic behaviour of rocks. Brittle and ductile deformation.

Unit -2

Folds: Basic fold geometry, nomenclature and definitions.
 Classification of folds. Describing folds. Interference and superposition of folds. Folds and ductile deformation
 Unconformity: Concept of unconformity, types of unconformity, criteria of recognition, significance of unconformity

Unit -3

Faults: Fault geometry, nomenclature and definitions,



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Classification of faults, Features associated with fault plane, criteria for recognizing fault in field. Faulting and earthquakes.

Concept of Shear zone.

Unit -4

Joints: Nomenclature and definitions related to joints and the structures related to joints. Classification of joints.

Linear structures: Lineations, cleavages and foliations. Morphology and description of lineations and cleavages, cleavages on different scales.

Significance of linear structures.

Unit -5

Introduction to plate-tectonics, Historical development of the concept of plate-tectonics

Continental drift, Sea-floor spreading; Concept of lithosphere and lithospheric plates. Nature of plate boundaries. Hot-spots and mantle plumes.

Geological structures associated with different plate boundaries, Continents and Oceans, Mountain ranges, Oceanic ridges and trenches, Stable and unstable tectonic zones.

Tectonics of Indian plate. Brief study of origin of Himalayas.

References:

Billings M P, Structural Geology, Pearson Education, 624pp

Davis, G.H., Reynolds, S.J., 1996, Structural geology of rocks and regions, 2nd Edition, John Wiley & sons.

Hamblin, W.K., Christiansen, E.H. 2003, Earth Dynamic Systems, 10th Edition, Prentice Hall.

Turcotte, D.L., & Schubert, G., 2001, Geodynamics 2nd Edition, Cambridge University Press

Pollard, D.D. & Fletcher, R.C. 2005, Fundamentals of Structural Geology, Cambridge University Press

Park, R. G., 1983, Foundations of structural Geology, Blackie Academic and Professional

Ramsay, J.G. & Huber, M.I. 1984, The Techniques of Modern Structural Geology, Vol 1: Strain Analysis, Academic Press

Ramsay, J.G. & Huber, M.I. 1987, The Techniques of Modern Structural Geology, Vol 2: Folds and Fractures, Academic Press.

Moore, E.M., Twiss, R.J. 1995, Tectonics, W.H. Freeman



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Ragan, D. M. (2009) Structural Geology: an introduction to geometrical techniques(4th Ed). Cambridge University Press (For Practical)

Economic Geology

GLO6IB09 Economic Geology

Unit 1

Historical development of economic Geology.

Geochemical distribution of elements.

Materials of mineral deposits – ore minerals, gangue minerals, tenor and grade of ores, ore shoots and bonanzas.

Classification of mineral deposits. Outline of Lindgren’s and Bateman’s classification-Syngenetic and epigenetic deposits.

Controls of ore localization – structural, stratigraphic, physical and chemical.

Brief study of metallogenic epochs and provinces – geologic thermometers.

Unit 2

Magmatic processes. – mode of formation – Early magmatic processes and deposits, disseminations, segregations and injections – Late magmatic processes and deposits –Residual liquid segregation and injection – immiscible liquid segregation and injection – sublimation.

Contact Metasomatic processes – the process and effects – resulting mineral deposits.

Hydrothermal processes – principles – Factors affecting deposition – wall rock alteration – minerals sequence – cavity filling deposits Fissure veins, shear – zone, stock-work, saddle reef, ladder vein, fold cracks, breccia filling, solution cavities, pore space and vesicular filling – replacement deposits- process and deposits – criteria of replacement.

Unit 3

Sedimentary processes and cycles – principles involved in sedimentation – cycles of iron and manganese



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Weathering processes – principles- Residual concentration process and deposits – mechanical concentration principles – eluvial, alluvial, beach and eolian placers.

Oxidation and supergene sulphide enrichment – solution and deposition in the zone of oxidation – secondary sulphide enrichments – Gossans and capping.

Metamorphic processes – Formation of Graphite, Asbestos, Talc, Soapstone and Sillimanite group of minerals.

Unit 4

Diagnostic physical properties, chemical composition, uses, modes of occurrence and distribution in India of the following:

Economic Minerals- Gold, Silver, Copper, Lead, Zinc, Iron, Manganese, Chromium, Tin, Aluminium

Radioactive metals - Thorium, Uranium, Titanium.

Industrial Minerals- Asbestos, Barite, Graphite, Gypsum and Mica.

Abrasives- Diamond, Corundum, Emery garnet, Abrasive sand, Tripoli, Pumice, Sandfeldspar, Limestone, Clay, Talc etc.

Refractories- fireclay, graphite, Dolomite and sillimanite group of minerals, diaspore, pyrophyllite, zircon etc

Ceramic minerals- Clay, Feldspar, Wollastonite,

Gemstones.

UNIT 5

Fossil fuels – coal and lignite – uses, classification, constitution, origin and distribution in India.

Petroleum- composition, uses, theories of origin, oil traps, and important oil fields of India.

A brief account of mineral deposits in Kerala.

Significance of minerals in the National Economy. Strategic, critical and essential minerals.

References:

Gokhale and Rao. 1973. Ore deposits of India. Thomson Press (India), Publication Division, Delhi

Mead. L.Jensen and Alan M.Bateman. 1981. Economic Mineral Deposits. John Wiley and Sons, New York

Krishnaswamy, S. 1972. Indian Mineral Resources. Oxford & IBH Pub. Co. New Delhi

Park C. F and Macdiarmid. 1964. Ore deposits. W.H. Freeman and CO

6. Umeshwar Prasad. 2006. Economic geology. CBS Publishers, New Delhi



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Palaeontology

GLO6IB10 Palaeontology

Unit 1:

An outline of life through ages, its evolution and distribution

Definition of Palaeontology – organic world – classification of animals– Habitats and habits of animals - Flora and Fauna – vertebrates and invertebrates

Definition of fossils – nature and modes of preservation of fossils: Unaltered hard parts: Altered hard parts :
Petrifaction, permineralisation, carbonisation, recrystallisation, silicification , mould, casts, tracks , trails, borings,

Uses of fossils – stratigraphic indicators – climatic indicators- indicators of palaeogeography – indicators of evolution and migration of life forms – indicators of new deposits of coal and petroleum

Unit 2:

Phylum protozoa – Order: Foraminifera: General morphology – chitinous test – septa, arrangement of chambers, suture, aperture, dimorphism – classification, geological history and stratigraphic importance.

Phylum coelenterata – class Anthozoa – zoological features – General morphology: corallum, corallite , theca , chambers, septa, fossula, columella, septal developments, classification – tabulate corals – Rugose corals evolution geological distribution – stratigraphic importance.

Sub phylum Hemichordata – class Graptozoa: order Dendroidea and Graptoloidea – general morphology , rhabdosome, stipe , theca , common canal , nema , virgula , sicula , angle of divergence, central disc, uniserial, biserial, classification, geological distribution and stratigraphic importance

Unit 3:

Phylum mollusca: Class Pelecypoda:- General characters – umbo, Hinge line – ligament – lunule and escutcheon – adductor impressions, pallial line, pallial sinus, dental patterns, ornamentation, classification, geological history

Class Gastropoda:- General morphology, shell forms, whorl, spire, spiral angle, suture, aperture, columella, umbilicus , peristome , aperture , (Holostomatus and siphonostomatus) – types of coiling – Dextral and sinistral – ornamentation , classification and geological history



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Class Cephalopoda:- General morphology , siphuncle, septa, septal necks, connecting rings, chambers, suture lines, (Nautilitic , Goniatitic , Ceratitic and Ammonitic) – shell forms – ornamentation – classification evolution, geological history- morphology of a Belemnite shell.

Unit 4:

Phylum Brachiopoda:- General morphology, umbo, hinge line , pedicle opening, delthyrium, deltidium pseudo deltidium – Brachial skeleton – morphometric details, ornamentation , classification , geological history.

Phylum Echinodermata: - Class Echinoidea:- General morphology, periproct, apical system (Anus, ocular plates, Genetal plates, madriporic plates), corona (Ambulacra , inter ambulacra) – peristome – Regular and irregular echinoids – classification – geological history. Class crinoidea:- General morphology , calyx , dorsal cup, (Radicals , basals, intrabasals), arms, stem, classification, geological history. Class Blastoidea: - General morphology – calyx, dorsal cup (Basals, radials, deltoids, ambulacra). Brachioles, cicatrix, geological history

Unit 5:

Phylum Arthropoda:- Class – Trilobita- General morphology : Cephalon: glabella, facial suture, free cheek, fixed cheek, genal angle , genal spine , cranidium; thorax – pygidium – classification – geological history.

Brief account of Siwalik vertebrate fossils

General classification of plant kingdom – plant fossils from India – A brief account of the following plant fossils :-

Glossopteris , Gangamopteris , Ptilophyllum , Calamites , Lepidodendron and Sigillaria

References:

Henry woods : Invertebrate palaeontology – Cambridge.
 Romer , A.S.: Vertebrate palaeontology, Chicago press.
 Arnold, C.A., An introduction to Palaeobotany., MC-Graw Hill.
 B.U. Haq and A. Boersma (1978) Introduction to marine Micropalaeontology. Elsevier, Netherlands
 Raup, D.M. and Stanley, M.S.: Principles of Palaeontology, CBS Publishers.
 Moore , R.C., Laliker , C.G. & Fisher, A.G.: Invertebrate Fossils , Harper brothers
 Shrock. R.R. and Twenhofel , W.H – 1953 : Principles of invertebrate Palaeontology, Arnold publication



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Stratigraphy And Indian Geology

GLO6IB11 Stratigraphy and Indian Geology

Unit 1

Scope of the subject, its relationship with other disciplines.

Principles of stratigraphy.

Indian Time Scale

Correlation, facies and unconformities.

Unit 2

Facies and facial changes-litho and bio facies- break in stratigraphic records -diastems.

Stratigraphic classification. Walters law

Biostratigraphic classification- Biozones, biohorizon, index fossil.

Range zone- Taxon range zone concurrent range zone, interval zone, assemblagezone, Acme zone.

Lithostratigraphic classification Group, Formation, Member, Bed.

Chronostratigraphic classification- Eonothem, erathem, system, series, stage.

Unit 3

Early Precambrian Stratigraphy: concept of craton, mobile belt, shield area, Sargursupracrustals; Tectonic frame work of south India; Dharwar Supergroup; Aravalli Supergroup

Late Precambrian Stratigraphy: Delhi Supergroup, Cudappah Supergroup, Vindhyan Super group. Brief study of Singhbhum craton, Sausar and Sakoli group

Unit 4

Cambrain of Salt Range and Paleozoic rocks of Kashmir Valley, Spiti Valley and Pensinsular India

Gondwana Supergroup – their classification, lithology, fossils and distribution in India.

Brief knowledge on distribution, lithology, fossil content and classification of Triassic of Spiti, Jurassic of Kutch and Cretaceous of Tiruchirappali.

Unit 5

Deccan Traps – Intra and Inter trapeans – Origin, composition, distribution.

Stratigraphy of Siwalik system, fauna and flora of Siwaliks



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Tertiary rocks of Assam, Karewa formation

Tertiary rocks of Tamil Nadu

Stratigraphy and Geology of Kerala

Reference:-

Lemon,R.R .1990. Principles of stratigraphy.. Merrill Publ. New York

Boggs,S.1987. Principles of Sedimentology and Stratigraphy, Merrill, New York.

Krishnan, M.S. 1982. Geology of India and Burma. CBS publishers, New Delhi

Vaidyanathan R and Ramakrishnan M. 2008. Geology of India, GSI Publications.

Advanced Crystallography and Mineralogy

GLO7IB12 Advanced Crystallography and Mineralogy

Unit 1

Crystallography: Derivation and determination of point groups.

Concept of space group. Crystalline state-Repetition theory. Translation periodicity of crystals. Basic rotational symmetries and possibility of simultaneous rotational symmetries in different directions of crystals-symmetrical plane and symmetrical lattices.

Derivation of 32 crystal classes. Stereographic projection of crystals. Crystal notation-Schoenflies notation. Herman Mauguin symbols-comparison between Schoenflies and International notations. Calculation of crystal elements to test the knowledge of the application of tangent relation, anharmonic ratios, Napier;s theorem and equation of the normal.

Unit 2

Conoscopic observations of minerals under petrological microscope:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Formation of interference figures; Uniaxial and biaxial interference figures

Determination of the Optic sign of uniaxial and biaxial minerals. Optical indicatrix of uniaxial and biaxial minerals.

Vibration directions and sign of elongation in minerals. Extinction and extinction angle. Determination of Optic axial angle (2V).

Unit 3

Mineralogical expression of radioactivity – metamictization, fracturing, discoloration, pleochroic haloes and fission tracks

Chemical classification of minerals. AAS, X, ICP, Electron probe microanalysis, scanning and transmission electron microscopy.

Unit 4

Rock and Ore forming minerals: Structure, P-T stabilities, paragenesis and mode of alteration of silicates, oxides, carbonates, phosphates, sulphates and halides.

Unit 5

Earth mineralogy: Average mineralogical composition of crust and mantle.

Mineral transformations in the mantle with depth.

Reference:-

Deer, W.A., Howie, R.A. & Zussman, J. 1962. Rock forming minerals. Vol. 1 to 5. Longmans, London.
 Blackburn, W.H. & Dennen, W.H. 1988. Principles of mineralogy. WCM Publishers, Iowa.
 Kerr, P.F. 1959. Optical mineralogy. 3rd edition. McGraw Hill, New York.
 Winchell, A.N. & Winchell, H. 1951. Elements of optical mineralogy. Part II. 4th edition. Wiley, New York.

Advanced Igneous and Metamorphic Petrology

GLO7IB14 Advanced Igneous and Metamorphic Petrology

Unit 1.

Introduction: Concept of heat and temperature inside the Earth. Melting and crystallization.

Magma and magmatic processes.



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Major, minor, trace and rare earth element geochemistry of igneous rocks. Significance of isotopic studies in the petrogenesis of igneous rocks.

Genetic significance of the textures and structures of the igneous rocks.

Unit 2

Classification of igneous rocks- concept of mode and norm,

Differentiation Index IUGS diagrams, TAS classification of volcanic rocks.

Mineralogical and chemical description and significance of important igneous rocks of continental and oceanic association.

Unit 3.

Phase rule and concept of phase diagrams- Unary, Binary, Ternary, Quaternary.

Study of the course of crystallisation of the following ternary systems: Forsterite- Diopside – Silica, Forsterite - Anorthite - Silica, Diopside - Anorthite – Albite, Albite

– Anorthite - Orthoclase, MgO - Al₂O₃ - SiO₂. Quaternary System, Di- An- Ab- Fo.

Unit 4.

Concept of metamorphism- Changes in pressure and temperature.

Equilibrium and non-equilibrium reactions.

Agents of metamorphism.

Types of metamorphism, metamorphic grade and facies of metamorphism.

Unit 5.

Solid-solid reactions, Genetic significance of textures and structures of metamorphism.

Application of thermodynamics in metamorphic rock formation.

Paired metamorphic Belts and plate tectonics.

Mineral paragenesis- Graphical representation of metamorphic mineral paragenesis, composition plotting ACF, AKF, AFM. Diagrams.

Reference: -



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Best, M.G., 2002, Igneous and metamorphic petrology, 2nd Edition, Blackwell Publishers

Philpots A.R., 1990, Principles of Igneous and metamorphic petrology, Prentice Hall.2.

Yardley, B.W., 1989, An introduction to metamorphic petrology, Longman

Tyrrell, G.W. 1978 -Principles of petrology – Chapman and Hall Ltd., London.5.Mihir K.Boss- Igneous Petrology

Advanced Stratigraphy

GLO7IB15 Advanced Stratigraphy

Unit 1

Development of stratigraphic concepts

Stratigraphic classification & nomenclature, study of stratigraphic elements

Stratification: processes controlling stratification- physical, chemical and biological

Vertical succession, lithological uniformity, heterogeneity, patterned succession, alternations, varve's, cycles (symmetrical and asymmetrical)

Lateral variations and facies concept

Unconformity

Methods of Correlation: Shaw's Graphic Correlation

Brief ideas of Magnetostratigraphy, cyclostratigraphy, pedostratigraphy, chemostratigraphy and sequence stratigraphy

Major Extinction events in Phanerozoic Eon

K-T Boundary extinction and its causes

Unit 2.



CRITERION	I	Curricular Aspects
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Precambrian Stratigraphy; Precambrian geochronology; Archean Geology of India: (i) Dharwar Craton, (ii) Singhbhum Craton; Proterozoic Geology of India: (i) Central Indian Tectonic Zone, (ii) Vindhyan Supergroup, (iii) Cuddapah Supergroup; Precambrian-Cambrian boundary.

Unit 3

Paleozoic Stratigraphy; Igneous activities and paleogeography during the Paleozoic Era; Paleozoic of Kashmir; Permian-Triassic Boundary Concept, classification, fauna, flora and age limits of Gondwana Supergroup and related paleogeography, paleoclimate, and depositional characteristics

Unit 4

Mesozoic Stratigraphy; Classification, depositional characteristics, fauna, and flora of: Triassic of Spiti, Jurassic of Kutch, Cretaceous of Trichinapalli; Deccan Volcanic Province; Cretaceous-Tertiary Boundary.

Unit 5

Cenozoic Stratigraphy; Paleogene Systems of India; Neogene Systems of India; Evolution of Himalayas; Siwalik Supergroup; Pleistocene-Holocene Boundary; Concept of Meghalayan.

Detailed Geology of Kerala

Reference:-

Boggs, S. (2001): Principles of Sedimentology and Stratigraphy, Prentice Hall.
 Danbar, C.O. and Rodgers, J. (1957): Principles of Stratigraphy, John Wiley and Sons.
 Doyle, P. and Bennett, M.R. (1996): Unlocking the Stratigraphic Record, John Wiley and Sons.
 Harold L. Lewis (1987): Earth through Time; 3rd Edition. Saunders College Publishing, New York
 K. S. Valdiya (2010): The Making of India-Geodynamic Evolution; Macmillan Publishers India Ltd.
 Krishnan, M.S. (1982): Geology of India and Burma, C.B.S. Publ. and Distributors, Delhi.
 M. Ramakrishnan and R. Vaidyanadhan (2008): Geology of India (Vol. I and II); Geological Society of India, Bangalore.
 M. S. Krishnan (1982), Geology of India and Burma; 6th Ed. CBS Publishers and Distributors (India).
 Naqvi, S.M. and Rogers, J.J.W. (1987): Precambrian Geology of India, Oxford University Press.
 Pascoe, E.H. (1968): A Manual of the Geology of India and Burma (Vols. I-IV), GSI, Govt. of India Press, Delhi.
 Pomeroy, C. (1982): The Cenozoic Era? Tertiary and Quaternary, Ellis Harwood Ltd., Halsted Press. Schoch,
 Robert, M. (1989): Stratigraphy: Principles and Methods, Van Nostrand Reinhold, New York.
 Roy, R. Lemon (1990): Principles of Stratigraphy; Merrill Publishing Company, Ohio
 Wadia, D.N. (1984), Geology of India; 4th edition. Tata McGraw-Hill Publishing Co. Ltd., New Delhi.



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Advanced Structural Geology

GLO8IB16 Advanced Structural Geology

Unit 1

Stress and Strain: Mechanical properties of rocks. Two dimensional stress and strain analyses. Relationships for elastic, plastic and viscous materials; Strain and displacement

Graphical representation of finite strain: Strain ellipsoid; Flinn diagram and Mohr's circle. Types of strain ellipsoids and their geological significance.

Strain analysis of naturally deformed rocks. Rheology.

Geological mapping and map reading; Attitudes of planes and lines and their representation.

Unit 2

Folds: Mechanics of folding; Geometric classification after Ramsay; Genetic classification after Donath and Parker

Minor folds and their uses in determining the major fold structure; Pumpelly's rule. Evidence of buckling

Interference patterns of superposed fold.

Distribution of strains in folds.

Unit 3

Faults: Dynamics of faulting; Displacement, slip and separation

Fault geometry and classification; Characteristics of faults and fault zones.

Causes and dynamics of faulting. Strain significance of faults. Fault-related folding.

Shear zones: Strain variation in shear zones. Shear sense indicators. Brittle and ductile shear zones, geometry and products of shear zones; shear sense indicators; Mylonites and cataclasites, their origin and significance.

Crustal scale faults: Strike-slip, transpression, and transtension

Unit 4

Joints and fractures: Distinction; Joint formation in response to loading and stress; Fracture development and propagation;

Classification of joints and extension fractures.

Analysis of joints and their tectonic significance.

Unconformity: Importance of unconformity in tectonostratigraphic correlation.



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Unit 5

Tectonites: Fabric elements and classification; L-, L-S and S-tectonic fabrics.; Petrofabric analysis.

Structural analysis: Principles and elements of structural analysis.

Geometrical analysis of simple and complex structures on mesoscopic to macroscopic scale. Gravity induced structures.

Stereographic projections: linear and planar features.

References:

Ramsay, J.G. & Huber, M.I. 1983. The Techniques of modern structural geology. V.1. Strain Analysis.

Ramsay, J.G. & Huber, M.I. 1987. The Techniques of modern structural geology. V.2. Folds and Fractures.

Park, R.G. Foundations of structural geology.

Turner, F.J. & Weiss, L.E. 1963. Structural analysis of metamorphic tectonites.

Price, N.J. & Cosgrove, J.W. 1990. Analysis of Geological structures. Cambridge University Press.

Davis, G.H. 1984. Structural Geology of Rocks and Regions.

Ghosh, S.K. 1993. Structural Geology: Fundamentals and modern developments.

Suppe, J. 1985 Principles of structural geology. Printice-Hall.

Fossen H. Structural Geology, Cambridge University press

Ragan D. M., Structural Geology, Cambridge University press

Billings M. P. Structural Geology, 1960, 514 pp

Exploration Geophysics and Field Techniques

GLO8IB17 Exploration Geophysics and Field Techniques

Unit 1

Scope of exploration geophysics – physical properties of the earth – Electrical methods – SP, IP, EM and Resistivity - methods of electrode arrangement – field methods – interpretation – application



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FIELD TECHNIQUES: - Resistivity surveys – Wenner and Schlumberger methods –electrical sounding and profiling – problems on these methods –methods –calculationof auxiliary point - SP methods - Interpretation of data – curve matching use of standard computer packages in interpretation

Unit 2

Gravity methods - Principle –density and rock types-- regional and local anomalies -field methods – gravimeters – corrections – interpretation of gravity data – determination of shape and depth of ore bodies — corrections & applications – GRACE mission

FIELD TECHNIQUES:- Problems on gravity methods - Preparation of anomaly maps - methods of corrections.

Unit 3

Magnetic methods – principle - field procedure – magnetometers – interpretation of magnetic data – size and shape of bodies – correction of magnetic data - applications -airborne geophysical surveys

FIELD TECHNIQUES:- Problems on magnetic methods – preparation of anomaly maps – methods of corrections

Unit 4

Seismic method: Seismic waves – elastic properties of materials - travel velocity in various geological formations – principles – field operation – refraction and reflection survey – correction of seismic data – methods of interpretation – determination of attitude and depth of formations – various types of shooting

FIELD TECHNIQUES:- Problems on refraction and reflection methods – 3 layer and inclined beds calculation based on intercept time and cross over distance

Unit 5

Radiometric method: Fundamentals of radioactivity – principle of radioactivity methods – types of counters – field methods and interpretation – Well logging - Selfpotential – resistivity – radioactivity logging methods – caliper and other miscellaneous logging methods – field procedure and interpretation of data

FIELD TECHNIQUES: - Radioactive methods - problems on well logging –interpretation of data.

REFERENCES

Arnaud Gerkens, J. C. d'. Foundation of exploration geophysics. Amsterdam ; New York :Elsevier ; New York, NY,



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U.S.A, 1989.

Burger, H.R., Exploration Geophysics of the Shallow Subsurface, Prentice Hall, 1992.

Dobrin, M.B An introduction to geophysical prospecting, McGraw Hill, New Delhi, 1984

Ramachandra Rao, M.B. Outline of geophysical prospecting. Wesley press, Mysore, 1975

Rama Rao, B.S and Murthy I.B.R Gravity and magnetic methods of prospecting. ArnoldHeinmann Pub. New Delhi, 1978

Robinson, Edwin S., Cahit Coruh, Basic exploration geophysics. New York : Wiley, 1988

Advanced Economic Geology

GLO8IB18 Advanced Economic Geology

Unit 1

Mineral deposits – types, morphology and forms of ore bodies.

Source of ore forming material. Physico-chemical environment of ore formation.

Genetic classification of mineral deposits. Magmatic Ore Deposits- Chromite, Magnetite and Platinum Group Element Deposits of the Bushveld Complex.

Hydrothermal Deposits; Volcanogenic Massive Sulfide (VMS), Porphyry, Sedimentary Exhalative (SEDEX), Mississippi Valley Type (MVT) Deposits. Iron-Oxide Copper Gold (IOCG) Deposits

Ore microscope - Polishing and mounting of ores. Mineralogical, trace element and stable isotope geothermometers; fluid inclusion studies.

Physical and optical properties of important ore minerals.

Textures and structures of ore and gangue minerals.

Ore genesis. Paragenetic sequences, zoning. Metallogenic epochs and provinces. Oreforming solutions and their migration.

Unit 3

Global Tectonics and Metallogeny; Patterns in the distribution of mineral deposits,

Crustal evolution and metallogenesis, Metallogeny through time, Plate tectonics and ore deposits.



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Strata bound and stratiform ore deposits - distribution, form, setting and origin

Unit 4

Nature and origin of mineral deposits associated with different rocks and their Indian examples: magmatic deposits in ultramafic, mafic and felsic association; Anorthosite -Fe - Titanium oxide distribution, setting, constitution and origin.

Post-magmatic deposits; sedimentary deposits; syn-sedimentary deposits; deposits formed in a near surface environment by residual concentration and mechanical concentration- Placer Deposits, Sedimentary Fe Deposits.

Infiltration and supergene enrichment, Metamorphic and metamorphosed deposits.

Unit 5

Genetic classification of U and Th deposits.

Geology and genesis of U deposits of Jaduguda. Pb - Zn deposits of Rajasthan, Cu deposits of Singhbhum and Malanjkhand, East coast Bauxite, Iron ore deposits of Bailadila and Kundremukh.

Brief introduction to gas hydrates.

Strategic, critical and essential minerals of India; National mineral policy of India.

References:

Barnes, H.L. (Ed.). 1997. Geochemistry of hydrothermal ore deposits. John Wiley & Sons.

Craig, J.R. & Vaughan, 1994. Ore microscopy and ore petrography. John Wiley & Sons.

Evans, A.M. 1992. Ore geology and industrial minerals. Blackwell Science.

Jensen, M.L. & Bateman, A.M. 1981. Economic mineral deposits. John Wiley & Sons.

Misra, K.C. 1999. Understanding mineral deposits. Kluwer Academic Publishers.

Mookherjee, A. 1998. Ore genesis – a holistic approach. Allied Publishers.

Stanton, R.L. 1981. Ore Petrology. Mcgraw Hill.

Nicholas Arndt and Clement Ganino. 2012. Metals and Society—An Introduction to Economic Geology, Springer Verlag, Berlin Heidelberg. Pp. 160. ISBN 978-3-642-22995-4.

Laurence Robb, 2004. Introduction to ore-forming processes. Blackwell science ltd., malden, ma, 373 p.

Mihir Deb and Sanjib Chandra Sarkar, 2017. Minerals and Allied Natural Resources and Their Sustainable Development: Principles, Perspectives with Emphasis on the Indian Scenario. Springer, Pp. 550.



CRITERION	I	Curricular Aspects
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Applied Sedimentology

GLO9IB19 Applied Sedimentology

Unit 1

Sedimentary processes: weathering, sediment transport by fluids. Simple fluid flow concept.

Textures of clastic and non-clastic rocks.

Sedimentary structures: classification, genesis and significance.

Use of structures and textures in basin studies.

Unit 2

Description and classification of siliciclastic rocks; sediment maturity; introduction to stream flow; grain transport and deposition

Sedimentary environment: physical and chemical properties of depositional environment and its classification.

Lithologies, structures and vertical sequences formed in fluvial, deltaic, coastal, deep sea, glacial, aeolian and carbonate depositional environments

Processes that influence the formation of sediments and sedimentary rocks, as well as focusing on the physical, chemical, and biological aspects of sediments and sedimentary rocks.

Unit 3

Provenance: light minerals, heavy minerals and insoluble residue in provenance studies and correlation of sedimentary rocks.

Diagenesis: compaction, cementation, chemical alteration and recrystallisation.

Sedimentation and Tectonics: tectonic control of sedimentation. Geosynclines and their lithological associations.

Plate Tectonics in relation to type and evolution of basins. Sedimentary basins-classifications, introduction to basin analysis. Post-depositional sedimentary processes- clastic and carbonate diagenesis

Unit 4

Clay Minerals: classification, techniques of identification, diagenesis and use in environmental interpretation.

Unit 5

Analytical techniques in sedimentology



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Reference

- F.J. Pettijohn (1975) Sedimentary rocks. Harper and Row Publ., New Delhi.
- Blatt, Middleton & Murray (1980) Origin of sedimentary rocks. Printice Hall Inc.
- J.D. Collins and D.B. Thompson (1982) Sedimentary Structures. George Allen &Unwin, London.
- M.E. Tucker (1981) Sedimentary Petrology: an introduction. John Willey & Sons, New York.
- Collinson, J., Mountney, N., Thompson, D., Sedimentary Structures, TerraPublishing, 3rd Edn., 2006
- Nicholls, G. Sedimentology and Stratigraphy. Wiley-Blackwell, 1999
- Prothero, D.R. and Schwab, F. Sedimentary Geology: An Introduction to SedimentaryRocks and Stratigraphy, 2nd Edn., W.H. Freeman, 2003
- Selley, R.C., Applied sedimentology, 2nd Edn., Academic Press, 2000
- Tucker, M.E. Sedimentary Petrology, 3rd Edn., Blackwell Science, 2001

Hydrogeology

GLO9IB20 - Hydrogeology

Unit 1

Geology and Hydrogeology and their relationship.

Surface and sub-surface distribution of water, aquifers, aquicludes, aquitard, aquifuge.

Physical properties of reservoir rocks.

Darcy's law and its range validity.

Groundwater flow under steady and unsteady conditions.

Occurrence of groundwater in different rock types.

Unit 2

Fresh and saltwater relationship in coastal areas.

Ghyzen-Herzberg principle. Prevention and control of sea water intrusion.

Overexploitation of groundwater. Groundwater contamination and pollution.



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Unit 3

- Quality and geochemistry of groundwater.
- Groundwater exploration and management.
- Natural and artificial recharge of groundwater.
- Modelling of aquifer systems.

Unit 4

Critical velocity ratio, Bligh’s Creep Theory for Seepage Flow, Measurement of Precipitation, Hydrograph and Runoff,
Well Hydraulics

Unit 5

Groundwater prospecting - Gravity, resistivity surveys, Magneto-tellurics; Water divining and other historical methods. Pumping tests and well yield.

Reference: -

Todd, D.K. 1988. Groundwater Hydrology. John Willey and Sons.
Davis, S.N. & De Wiest, R.J.N. 1966. Hydrogeology. John Wiley & Sons, New York.
Raghunath, H.M. 1983. Groundwater. Willey Eastern, Calcutta.

Advanced Remote Sensing & Geographic Information System

GLO9IB21 - Advanced Remote Sensing & Geographic Information System

Unit 1

Multispectral Remote Sensing, Types of satellite imageries.
Introduction to satellite/digital image processing: concept of digital images, data acquisition, image registration, radiometric and geometric correction of satellite data, Image enhancement techniques, image transformation- Principal Component Analysis (PCA), Intensity Hue Saturation (IHS), Brovey method and Wavelet transformation. Image classification: Supervised classification and Unsupervised classification, Advantages, Disadvantages and limitations, Accuracy assessment; principles of Remote sensing in geology, Spectral characteristics of rocks and minerals



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Unit 2

Hyperspectral remote sensing, Spectral Signatures and BRDF in the Visible, NearInfrared and Shortwave Infrared regions of EMR, Hyperspectral Issues.

Hyperspectral Data cube. Radiation science basics - Thermal radiation principles, thermal interaction behavior of terrain elements, thermal sensors and specifications; Image characters, spatial and radiometry; interpretation of thermal image; Comparison of Multispectral, Hyperspectral and thermal Image Data

Unit 3

Introduction to microwave remote sensing – concept and principle; Interactions between radar and surface materials - complex dielectric properties, roughness polarization; Passive & active microwave remote sensing Application of microwave remote sensing and microwave image interpretation.

Unit 4

Introduction to Geographic Resources Analysis Support System (GRASS)

GIS - Raster data handling – Reclassification, recode - map algebra - Resampling and interpolation of raster data – Overlaying - Spatial analysis Neighborhood analysis and cross-category statistics - Buffering - Cost surfaces - Terrain and watershed analysis –

Modeling raster data – Vector data handling - Topological operations – Buffering – Overlay – Dissolve – clip, union intersect – Network analysis – Spatial interpolation – handling lidar point cloud data

Drainage mapping and morphometric analysis

Digital elevation model (DEM) in hydrological modelling using GIS, Integration of Remote Sensing and GIS, Water quality monitoring and hydrogeological modeling using GIS.

Database design; analysis for urban and regional resource mapping, Urban hazards and risk management through GIS

Unit 5

Concept of Digital Elevation model, Digital elevation model (DEM) in hydrological modelling using GIS. Integration of Remote Sensing and GIS. Database design & analysis for urban and regional resource mapping, Urban hazards and risk management through GIS



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References

- Remote sensing and image interpretation by Lillisand, T. M. and Keifer, R. W., 2007, JohnWilley and Sons, USA
- Introduction to environmental remote sensing by Barrett, E. C. and Curtis L. F., 1999, Chapman and Hall Publishers, USA.
- Fundamentals of remote sensing by Joseph G., 2003, Universities Press, Hyderabad.
- Introduction to geographic information systems by Chang, Kang-taung, 2002, TataMcGraw-Hill, USA.
- Cushman A. Joseph, Foraminifera, Harvvard University Press, 1959
- Woods Henry, Invertebrate Palaeontology, Cambridge University Press, 1961
- Zittel Karl A. Von, Text Book of Palaeontology, Parts I and II, McMillan, 1964.
- Noa Version, Stratigraphic Principles of Palaeontology, Oxford University Press, 1952
- John J. Daniel, Introduction to Microfossils, Harper and Brothers, 1956
- Moore R.C., Lalicker C.G., Fisher A.G., Invertebrate Fossils, McGraw Hill, 1952

Geochemistry And Isotope Geology

GLO10IB23 Geochemistry And Isotope Geology

Unit 1

- Different processes of nucleosynthesis Meteorites, Chondrites and chondritic ratios.
- Origin of the solar system and distribution of elements with respect to distance fromthe Sun. Geochemical and Cosmo chemical classification of elements

Unit 2

- Thermodynamics and thermodynamic control on distribution of chemical species(between coexisting phases).



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Thermodynamics of mixing and solutions. Kinetics and metastability. Clapeyronequation. Simple thermodynamic calculations involving phase changes and equilibrium reactions.

Unit 3

Aqueous geochemistry: Molarity and molality, solubility product and solubility, acids and bases, dissociation constant, pH, hydrolysis, ionic concentration. **CO₂-H₂O interaction to form carbonic acid, dissolution of calcite, weathering reactions.**

Unit 4

Discovery of radioactivity, stable and radiogenic isotopes Nuclear structure and energies. Stability of nuclides. Radioactive decay schemes. Decay constant, half life, parent-daughter relations. Methods of dating: Isochron method, model/mineral ages, Fission track, ⁴⁰Ar-³⁹Ar, U and Th disequilibrium, choncordia method, ¹⁴C, Be and Al. Interpretation and geological significance of ages. Isotope systematics of K-Ar, Rb-Sr, Sm-Nd, U-Th-Pb in igneous, metamorphic and sedimentary rocks and in evolution of ocean, crust and mantle. Short-lived isotopes..

Unit 5

Stable isotopes: Isotopes of oxygen and hydrogen, carbon, nitrogen and sulphur. Processes of isotope fractionation, fractionation factor. O isotopes: fractionation in the hydrologic cycle, paleoclimatology. **C and N isotopes fractionation in biological processes.** Use of S isotopes in ore geology. Stable isotope geothermometry and geobarometry. **Isotopes in mineral exploration, petroleum exploration, paleo-climate evaluation, health and environmental aspects.**

Reference

Faure, G. (1986). Principles of Isotope Geology. John Wiley, 589p.
Doe, B.R. (1970) Lead isotopes. Springer Verlag, 137p.
Faure, G. and Powell, J.L. (1972) Strontium Isotope Geology. Springer Verlag, 188p.



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Crystallography and Mineralogy

GLO4IH02(P) Crystallography and Mineralogy

Mineralogy

Megascopic identification:

Megascopic identification and description of the following: Quartz, smoky quartz, milky Quartz, Rosy quartz, Amethyst, Chalcedony, Agate, Flint, Jasper, Chert, Opal, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Sodalite, Enstatite, Bronzite, Hypersthene, Diopside, Augite, Spodumene, Acmite, Rhodonite, Wollastonite, Anthophyllite, Tremolite, Actinolite, Hornblende, Olivine, Serpentine, Muscovite, Biotite, Vermiculite, Phlogopite, Chlorite, Epidote, Garnet, Natrolite, Stilbite, Apophyllite, Talc, Steatite, Andalusite, Kyanite, Sillimanite, Staurolite, Cordierite, Apatite, Beryl, Topaz, Calcite, Dolomite, Tourmaline, Zircon, Fluorite.

Microscopic identification:

Microscopic identification and description of the following: Quartz, smoky quartz, milky Quartz, Rosy quartz, Amethyst, Chalcedony, Agate, Flint, Jasper, Chert, Opal, Orthoclase, Microcline, Albite, Oligoclase, Labradorite, Nepheline, Leucite, Sodalite, Enstatite, Bronzite, Hypersthene, Diopside, Augite, Spodumene, Acmite, Rhodonite, Wollastonite, Anthophyllite, Tremolite, Actinolite, Hornblende, Olivine, Serpentine, Muscovite, Biotite, Vermiculite, Phlogopite, Chlorite, Epidote, Garnet, Natrolite, Stilbite, Apophyllite, Talc, Steatite, Andalusite, Kyanite, Sillimanite, Staurolite, Cordierite, Apatite, Beryl, Topaz, Calcite, Dolomite, Tourmaline, Zircon, Fluorite.

Megascopic identification and description of the following rocks:

Granite, Graphic granite, Pegmatite, Aplite, Granite Porphyry, Syenite, Syenite porphyry, Diorite, Gabbro, Anorthosite, Dunite, Pyroxenite, Dolerite, Basalt, Rhyolite, Felsites, Obsidian, Pumice, Scoria.

Slate, Phyllite, Schists, Gneisses, Quartzite, Marble, Amphibolite, Eclogite, Leptynite, Charnockite, Khondalite, Schorl rock, Banded Magnetite Quartzite

Conglomerate, Breccia, Sandstone, Arkose, Shale, Limestone, Laterite, Chert, Grit, Lignite.

Microscopic identification and description of the following rocks:

Mica Granite, Hornblende Granite, Graphic Granite, Syenite, Nepheline Syenite, Diorite, Gabbro, Dunite, Peridotite, Granite porphyry, Diorite, Dolerite, Anorthosite, Basalt.

Slate, Chlorite schist, Mica schist, Kyanite schist, Charnockite, Eclogite, Amphibolite, Khondalite, Augen Gneiss, Garnet Biotite Gneiss,

Conglomerate, Breccia, Sandstone, Arkose, Shell limestone



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Structural

GLO5IH04(P) Structural

Illustration with the help of neat diagrams of the following:

Attitude of beds, true and apparent dip, strike and dip symbols, rules of 'V', types of Folds, Faults, Joints and Unconformities. Maps with suitable sections and geological descriptions

- Simple horizontal beds – two maps.
- Study of effect of relief on 'V' of outcrops – four maps.
- Simple dipping beds – three maps.
- Simple dipping beds with intrusions – three maps.
- Tracing the outcrops –with three point problems- Three maps.
- Problems involving bore hole data, thickness, dip and apparent dip –three maps.
- Simple dipping beds with unconformity – five maps.
- Folded beds – five maps.
- Maps with different types of faults –five numbers.
- Combination of intrusions, unconformity, folds and faults –six maps.

Structural problems:

Problems involving true and apparent dip, true vertical thickness and width of outcrops. Three-point problems.

Economic Geology

GLO6IH05(P) Economic Geology

Economic Geology

Megascopic identification and description of Indian occurrences & uses of the following ore and industrial Minerals: -

- Sulphides: Realgar, Orpiment, Stibnite, Molybdenite, Galena, Sphalerite, Chalcophyrite, Pyrite, Arsenopyrite, Marcasite.
- Sulphates: Barite, Celestite, Gypsum,
- Oxides: Cuprite, Corundum, Hematite, Ilmenite, Magnetite, Chromite, Cassiterite, Rutile, Pyrolusite, Psilomelane, Goethite, Limonite, Bauxite,
- Carbonates: Calcite, Dolomite, Magnesite, Siderite, Aragonite, Witherite, Strontianite, Cerussite, Azurite, Malachite.
- Industrial Minerals: Halite, Fluorite, Phosphatic Nodule, Monazite, Graphite, Coal and its varieties, Asbestos.



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Paleontology

Megascopic identification and description of the following fossils with neat diagrams:-

- **Anthozoa:** Calceola, Zaphrentis, Lithostrotion, Favosites, Halysites, Montlivaltia, Isastrea, Thecosmilia;
- **Brachiopoda:** Sprifer, Productus, Terebratula, Rhynchonella, Athyris, Orthis, Lingula
- **Echinoderma:** Cidaris, Hemicidaris, Micraster, Holaster, Hemiaster, Pentremites,
- **Mollusca-Lamellibranchia:** Arca, Cardium, Cardita, Pecten, Trigonia, Megaladon,
- Spondylus, Gryphaea, Exogyra, Ostrea, Inoceramus, Alectryonia, Hippurites, Venus
- **Mollusca-Gastropoda:** Natica, Turbo, Trochus, Turritella, Cerithium, Conus, Murex, Fusus, Physa, Bellerophon,
- **Mollusca-Cephalopoda:** Nautilus, Goniatites, Ceratites, Acanthoceras, Phylloceras, Scaphites, Baculites, Turritiles and Belemnites,
- **Trilobites:** Paradoxides, Calymene, Phacops, Olenus, Olenellus.
- **Graptolites:** Phyllograptus, Tetragraptus, Didymograptus, Diplograptus, Monograptus,
- **Plant fossils:** Glossopteris, Gangamopteris, Ptillophyllum, Lepidodendron, Sigillaria, Calamites, Elatocladus, Vertibraria.

Mineralogy, Crystallography, Geomorphology, Igneous and Metamorphic Petrology

GLO7IH06(P) Mineralogy, Crystallography, Geomorphology, Igneous and Metamorphic Petrology

Crystallography:

Spherical projection of Cube, Octahedron and Dodecahedron.

Stereographic projection of holohedral classes of all the systems, pyritohedral, tetrahedral, plagiocedral classes of Isometric system and Rhombohedral classes of hexagonal system.

Gnomonic projections of the normal class of Isometric, Tetragonal, Hexagonal and Orthorhombic systems.

Calculations of Axial ratios, Zone symbols, Napier's rule, Laws of anharmonic ratio.



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Mineralogy:

Identification of mineral specimens based on physical properties.

Determination of the following optical characters by classical methods:

- Order of interference colour
- Sign of elongation
- Birefringence
- Scheme of pleochroism
- Optic orientation
- Determination of the vibration directions of polariser and analyzer
- Extinction and extinction angle determination
- Optic sign
- Refractive index by Becke line method
- Identification of thin sections of important rock forming minerals

Recalculation of mineral formula from EPMA analysis – Garnet; Pyroxene; Feldspar; biotite; hornblende

Geomorphology: Interpretation of toposheets and identification of geomorphic features, fluvial and coastal land forms. Calculation of surface area and slope. Study of drainage pattern and morphometric analysis.

Igneous and Metamorphic Petrology:

P igneous and metamorphic rocks. Textures and structures of igneous and metamorphic rocks and their genetic significance with neat sketches.

Determination of modal composition, Calculation of norm (25 exercises). Niggli values. Variation diagrams Harker, Larsen, Niggli. Calculation of Differentiation index. Peacock alkali-lime index. Use of triangular diagram in

the classification of igneous rocks. Use of triangular diagram in the classification of igneous rocks.

Identification of metamorphic mineral paragenesis in hand specimens and thin sections and arranging them according to the intensity of metamorphism. Graphical representation of metamorphic mineral parageneses. ACF and AKF diagrams. AFM diagrams.

Construction of phase diagrams based on experimental data of the following systems- Albite-anorthite, Forsterite-fayalite, Diopside- anorthite, Diopside - albite, Forsterite -silica.

reparation of thin sections of igneous and metamorphic rock samples. (2 nos. each). Petrography of



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Structural Geology, Geophysics and Economic Geology

GLO8IH07(P) - Structural Geology, Geophysics and Economic Geology

Structural Geology:

Interpretation of geologic maps. Trigonometric, graphic and stereographic solutions to problems in structural geology. Geometric analysis of planar and linear structures. Fabric diagrams, Rose diagrams and histograms

Geophysics

Electrical profiling and sounding. Gravity measurement at few selected points, study of the drift of gravimeter. Measurement of horizontal and vertical components of the earth's magnetic field. Simple exercises on seismic exploration.

Economic Geology:

Identification of important ore minerals. Collection and display of data on production, consumption and export of important minerals. Identification of ore minerals under ore microscope. Genetic significance of important ore.

Sedimentology, Hydrogeology, Remote Sensing and Geographic

Information

GLO9IH08(P) Sedimentology, Hydrogeology, Remote Sensing and Geographic Information

Sedimentology

Study of clastic and non-clastic rocks in hand specimen. Microscopic examination of important rock types.

Separation of

heavy minerals and study of their microscopic characteristics.

Grain size analysis by sieving, plotting of size distribution data. Determination of roundness and sphericity of grains.

Hydrogeology

Preparation and interpretation of water table contour maps.



CRITERION	I	Curricular Aspects
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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Problems on Porosity, permeability, void ratio and Darcy's Law. Computation of aquifer parameters from pump test data.

Graphical representation of hydro chemical data - Piper trilinear diagram, USSL Diagram, Stiffs polygon.

Calculation of various parameters based on chemical data, electrical resistivity survey and interpretation of data.

Remote Sensing and Geographic Information System

Georeferencing, Plotting of points, lines, polygons.

Length and area calculation

Map making – layout creation

Basics of digital image processing

Band combinations of satellite data

Gathering satellite images from USGS and Bhuvan

Extraction of features

Classification of features.

Advanced Palaeontology and Geochemistry

GLO10IH09(P) Advanced Palaeontology and Geochemistry

Advanced Palaeontology

Separation of microfossils and preparation of slides of Ostracoda, Foraminifera and Bryozoa. Identification and study of microfossils in slides, at least 10 Nos.

Geochemistry

Chemical Analysis of elements and oxides for Rock Sample/Sediments/Water samples using various methods (Titration, AASS, UV Spectrophotometer and Flame Photometer)

Calculation of isotope proportions in samples.

Determination of pH of groundwater samples

Calculation of bulk rock compositions from modal mineralogy and mineral chemistry

Calculation of $\delta^{18}O$ in water reservoirs and ice-cores

Calculation of palaeo sea-surface temperatures

Calculation of age of rock samples based on different decay schemes



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Remote Sensing and Geographic Information System

GLO6IE01(E01a) Remote Sensing and Geographic Information System

Unit-1:

History and development of Remote Sensing. Basic concepts and principles of Remote Sensing. Introduction to electromagnetic radiation and electromagnetic spectrum. Interaction of EMR with objects and Atmosphere.

Passive and Active remote sensing. Platforms and Sensors. Different resolutions concepts, pixel size and scale

Unit-2

Introduction to the basics of aerial photography and photogrammetry

Introduction to GPS, Orbit elements, Types of orbits, Motions of planets and satellites

Satellites and their characteristics, Sun synchronous and geo-synchronous satellites, basics of visual interpretation of satellite images and their keys.

Unit: 3

Brief history of GIS; Introduction to GIS – definition, concepts and components of GIS, Geospatial data type

GIS system, GIS science and GIS applications; Definition of map, different types of thematic maps, scale

Geographic coordinate system, Datum; Types of map projections; Commonly used map projections; Projected Coordinate System.

Unit 4

Visualization of geographical data, Basic ideas about data visualization, Geo-referencing, Maps and cartographic communication.

Digital representation of geographic data: Data structure, spatial data model, raster and vector models. Comparison of raster and Vector data.

Unit 5

GIS Data Management: GIS File Data Formats-Vector Data File Formats and Raster Data File Formats Coastal Regulatory zone (CRZ) Continental margin: features of continental shelf, continental slope and continental rise.



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References

- Tom Garrison – Essentials of Oceanography
 Trujillo and Thurman – Essentials of Oceanography
 John Marshall, R Alan Plumb – Atmosphere, Ocean and Climate Dynamics- An introductory Text
 Robert H Stewart – Introduction to physical Oceanography
 Yasso, W. E., Oceanography
 Trask, P. D., Recent Marine sediments, Dover publications, 1939
 Weisberg, J., and Parish, R, Introductory Oceanography. .McGraw Hill, 1974Text Books
 J.P.Kennet (1982) Marine geology. Printice Hall Inc., New Jersey, 813p.
 E. Seibold & W.H.Berger (1982) The sea floor. Springer-Verlag, Berlin.
 J.Weisberg & H. Parish (1974). Introductory Oceanography. McGraw Hill.
 B.W.Pipkin, D.S.Gorslin, R.E.Casey & D.E. Hammord (1972). Laboratory exercises in oceanography. W.H.Freeman & Co., San Francisco, 255p.

Coal and Petroleum Geology

GLO10IE04(E04c) Coal and Petroleum Geology

Unit 1

Origin of Coal, sedimentology of coal bearing strata, mode of occurrence of structures associated with coal seams, classification of coal, chemical analysis of coal.

Unit 2

Study of Macroscopic and Microscopic constituents of coals.

Elementary knowledge about the application of reflectance and fluorescence study of coal

Basic idea about the coal preparation, carbonization, coal forming epochs in the geological past.

Coal deposits of India and depositional environment of some important coal fields of India. Methods of Coal prospecting and estimation of its reserves.

Coal Industry in India.

Unit 3



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Historical development of petroleum geology.

Physical and chemical properties of petroleum and related substances.

Surface and subsurface geographic and stratigraphic occurrence of petroleum.

Unit 4

Origin of petroleum: inorganic and organic theories of source of petroleum.

Environments and processes of transformation of source material to petroleum hydrocarbons.

Migration of petroleum hydrocarbons: primary and secondary migration. Factors causing migration of petroleum

Reservoir rocks: characteristics of reservoir rocks and their types. Principles of determination of porosity and permeability.

Traps: characteristics and classification. Structural, stratigraphic, combination and fluid barrier traps. Accumulation of fluid petroleum

Unit 5

Exploration: a review of prospecting methods as applied to the exploration of petroleum accumulations

Estimation of petroleum reserves: brief outline of methods of estimation of petroleum reserves Petroleum

prospects: Important oil & gas fields and petroleum prospects of India.

References:

Stutzar, O and NOC, A.C.: Geology of Coal. University of Chicago Press, Chicago.

Moor, E.S.(ed): Coal, its properties, analysis, classification, geology, extraction, uses and distribution. John Wiley & Sons.

Stach et.al.: Text book of Coal Petrology. Gebruder Borntraegu, Stuttgart.

Scott, A.C.: Coal and Coal-bearing Strata: Recent Advances. Geol. Soc. Publ. No.32, Blackwell.

Levorson, A.I. Geology of Petroleum.

Lanes, K.K. Petroleum Geology.

Russel, W.L. Principles of Petroleum Geology

Pirson, S.J. Oil Reservoir Engineering.

Lalicker, C.G. Principles of Petroleum Geology



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Personality And Personal Growth

Personality And Personal Growth

Unit I: Concepts and definitions

The concept of self, personality and identity (Allport, Rogers, Maslow, Skinner and Kohut), Perspectives & notions of personality (Kenneth H. Craik, Robert Hogan and Raymond N. Wolfe); Self, identity and personal growth in psychology (Anand C Paranjpe); Self as a object & as a process;

Unit II: Self from a Developmental Perspective

Introduction to the ideas of William James, M Lewis (Concepts of “I” & “me”: Categorical Self); G.H Mead, Cooley (Symbolic Interactionism); Robert Kegan (A Constructivist: Developmental approach); Carl Rogers’ Phenomenology; H. Murray, Erick Erickson and Kohlberg’s’ Moral development, Kurt Lewin (Dynamics of Personality)

Unit III: Significant Contributors to understand of Self

Freud; C Jung; Winnicott; H. Kohut; Eric Fromm; A. Maslow; Rollo May; Viktor Frankel; Martin Seligman; B.F Skinner; Anna Freud; Karen Horney, Allport and Lacan

Unit IV: Personal Growth

Historical background of dialectics of self in Eastern Thoughts – Upanishad, Buddhism, Sufism & Integral Perspective - Historical background of dialectics of self in Western Thoughts – Hume, Kant, Husserl - Culture Self, Enlightenment & Self-realization in Indian Thoughts -Yoga, Bhagavat Gita, Zenand Sufism Holistic Psychology

References

- Biswas, C. (2016). Transcendental self and its knowledge through classical Indian philosophy and modern western philosophy. Doctoral thesis Rabindra Bharati University Kolkata.
- Fadiman, J., & Fragers, R. (2007). *Personality and personal growth* (6th ed.). New Delhi, India: Pearson Education India.
- Gurewich. J. F., Tort. M., & Fairfield. S. (1999). *Lacan and the New Wave in American Psychoanalysis: The Subject and the Self*. New York: other Press
- Hall, C. S., & Lindsey, G. (1998). *Theories of Personality*. New York: John Wiley.



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Hogan, R., & Blicke, G. (2013). Socioanalytic theory. In N. D. Christiansen, & R. P. Tett (Eds.), *Handbook of personality at work* (pp. 53–70). New York: Routledge.

Hogan, R. (1982). A socioanalytic theory of personality. In M. M. Page (Ed.), *Nebraska symposium on motivation* (pp. 55–89). Lincoln, NE: University of Nebraska Press.

Magnusson, D., & Endler, N.S. (1977). *Personality at crossroads*. New Jersey, Hillsdale: Lawrence Erlbaum Associates.

Pervin, A. (2006). *Handbook of Personality*. New York: John Wiley.

Varma, S. (2005). From the self to the Self: An exposition on personality based on the works of Sri Aurobindo. In K. R. Rao, & S. M. Bhatt (Eds.), *Towards a spiritual psychology*. New Delhi, India: Samvad.

Additional Reading

Allport, G.W. (1962). *Personality: A Psychological Interpretation*. Constable & Co.

Allport, G.W. (1968). *The Person in Psychology: Selected Essays*. Beacon Press.

Biscoff, L. J. (1970). *Interpreting Personality Theories*. New York: Harper & Roe.

Cattell, R. B. (Ed.) (1970). *Handbook of Modern Personality Theory*. Aldine.

Dezhi, D. (1998). *On the History, Theoretical Difficulties and Prospects of the Western Subjectivity Thought*.

Dhar, P. L. (2011). No I, No problems: The quintessence of Buddhist psychology of awakening. *Psychological Studies*, 56(4), 398-403.

Epstein, M. (1998). *Going to pieces without falling apart*. New York: Broadway Books.

Eysenck, E. (1966). *Dimensions of Personality*. Routledge.

Kakar, S. (Ed.) (1979). *Identity and adulthood*. New Delhi, India: Oxford University Press.

McCrae, R. R., & Costa, Jr., P. T. (2005). *Personality in Adulthood: A Five Factor Theory Perspective* (2nd ed.). New York: Guilford Publications.

Nandy, A. (1983). *The intimate enemy: Loss and recovery of self under colonialism*. New Delhi, India: Oxford.

Paranjape, A. (2002). *Self and identity in modern psychology and Indian thought*. New Delhi: Springer.

Rogers, C. (1980). *A way of being*. Boston, MA: Houghton Mifflin

Rogers, C. R. I. (1995). *On becoming a person: A therapist's view of Psychotherapy*. Boston: Houghton Mifflin.

Cognitive Psychology

Cognitive Psychology

UNIT I: Attention and Perception

What is cognitive psychology and its historical antecedents



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Theoretical approaches to perception: Bottom up approach (Direct perception, Template and Prototype theory, Feature theory – Pandemonium model, Recognition By Components theory);

Top down approach (Navon, Effect of context, Configural- superiority effect); Integration (Computational theory)

Attention: Selective, Sustained, Divided, and Alternating attention; Selection models of attention (Broadbent model, Triesman model), Capacity model (Kahneman’s model), Multiple resource model (Wicken’s model)

UNIT II: Learning & Memory

Concept of learning: Classical conditioning: Basic concepts; Recent concepts (Blocking effect, Overshadowing, CS pre exposure effect, Higher order, Sensory pre conditioning, Contributions of McKintosh and Rescorla); Applications. Operant conditioning: Basic concepts; Different concepts of reinforcement (Need reduction, Premacks principle, response deprivation theory); Applications Concept of memory, Store models: Atkinson-Shiffin model Levels of processing model and self-referencing effect, Nature of memory model, Working Memory model PDP or connectionist model. Forgetting (Consolidation theory, Interference theory, Decay theory, Discrimination)

UNIT III: Motor cognition & Mental stimulation

Nature of motor cognition: Perception, action cycle, nature of motor processing in brain, role of shared representations, mental stimulation and motor system, motor priming and mental stimulation of action. Imitation: Development of imitation, cognitive components of imitation, simulation theories of action understanding,

UNIT IV: Thinking and Intelligence

Problem solving: Problem and its type; Approaches to problem solving, Problem solving behaviour (Reproductive – Analogy and transfer, Productive - Insight); Obstacles (Mental set or Entrenchment, Functional fixedness, Transfer). Decision making : Classical Theory and its critique – Satisficing, Elimination by aspect, naturalistic decision making; Biases and heuristics, Process of group thinking Reasoning: Deductive (Conditional – Types or Propositional calculus and Errors, Syllogistic – Linear, Conditional and Errors); Inductive reasoning – (casual inferences, categorical inferences and reasoning by analogy)

References

- Eysenck, M. W., & Brysbaret, M. (2018). *Fundamental of cognitive psychology* (3rd Ed) . New York; Routledge.
- Smith, E. E., & Kosslyn, S. M. (2015). *Cognitive psychology: Mind and Brain*. New Delhi, Pearson India Education services, Ltd.
- Eysenck, M. W. (2006). *Fundamentals of Cognition*. New York: Psychology Press.



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Hergenhahn, B. R., & Olson, M. H. (2008). *An introduction to theories of learning*. N.Delhi: Pearson Education.

Kellogg, R. T. (2003), *Cognitive psychology*, (2nd ed.). N. Delhi: Sage.

Mazur, J. E. (2002). *Learning and behavior*, (5th ed.). New Jersey: Prentice Hall.

Sternberg, R. J. (2007), *Cognitive psychology*. N. Delhi: Thomson Wadsworth.

Berk, L. E. (2009). *Cognitive development*. (8th ed.). Boston: Pearson Publishing.

Neath, I., & Suprenant, A. M. (2003). *Human memory*, (2nd d.). Australia: Thomson Wadsworth.

Psychopathology – I

Psychopathology – I

Unit I: Normality-Mental Health, Classification, Assessment of Mental Disorders

Normality and Mental Health - Models of Mental health - Definition of mental disorder

Classification systems - DSM 5, ICD-10

Case history taking - History of Present Illness - Past Psychiatric and Medical History - Treatment

History - Family History - Present History - Premorbid Personality

Mental Status Examination - General Appearance and Behaviour - Speech-Rate, Volume, Tone, Flow

- Mood And Affect – Quality, Reactivity, Persistence - Thought-Stream and Form of thought -

Content of Thought - Perception: - Hallucinations - Illusions and Misinterpretations -

Depersonalization/Derealization - Cognition: Orientation – Attention– Concentration – Memory –

Intelligence - Abstract Thinking – Insight – Judgment

Unit II: Developmental Disabilities

Intellectual disability - Diagnostic criteria, Developmental characteristic features and Degrees or Severity of Intellectual Disability

Etiology - Down Syndrome, Fragile X Syndrome, Phenylketonuria, Acquired developmental factors

Autism Spectrum Disorder - Core symptoms and diagnostic features, Rett syndrome, Asperger’s - characteristic features

Attention Deficit Hyperactivity disorder - Diagnostic criteria and etiology

Specific learning disorder - diagnostic criteria and characteristics

Communication disorders - Expressive language deficits, Mixed receptive and expressive deficits, Stuttering- clinical features and etiology



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Unit III: Stress Related and Other Adjustment Disorders, Dissociative Disorders Post-traumatic stress disorder and Acute Stress disorder - diagnostic criteria Risk factors in PTSD

Adjustment disorders - diagnostic criteria and clinical features, Etiology

Dissociative Amnesia, Fugue, Dissociative Identity Disorder - Clinical features and Etiology

Unit IV: Anxiety Disorders

Separation Anxiety Disorder, Selective mutism - characteristic features and etiology

Specific phobia, Social phobia - clinical features and etiology

Panic disorder & Agoraphobia - diagnostic criteria, Etiology - biological, psychosocial factors Obsessive-compulsive disorder, Generalized anxiety disorder - Characteristics and etiology.

References

Carson, R.C., Butcher, J.N., & Mineka, S. (2014). *Abnormal psychology and modern life*. 16th edition.

Diagnostic and Statistical Manual-5 (2013). American Psychiatric Association.

Geddes, J.R., Andreasen, N.C. & Goodwin, G. M. (2020) *New Oxford Textbook of Psychiatry, III Edition*. University Press.

Kaplan, I. H & Sadock, J. B., (2015) *Synopsis of Psychiatry, Behavioural Sciences/Clinical Psychiatry, 11th Edition*. London: Lippincott Williams & Wilkins.

Korchin, J. S. (2004). *Modern clinical psychology: Principles of intervention in the clinic and community*. CBS Publishing Co.

Sarason, L. G., & Sarason, B. R., (2002) *Abnormal Psychology: the problem of maladaptive Behaviors*. Singapore: Pearson Education.

Wenar, C., & Kerig, P. (2000). *Developmental Psychopathology: From Infancy through Adolescence* (4th ed.), Singapore: The McGraw-Hill Co. Inc.

Clinical Psychology: Theory & Practice

Clinical Psychology: Theory & Practice

Unit I: Introduction to Clinical Psychology

A field of clinical psychology- Historical overview of Clinical Psychology- Clinical Psychology and other areas of psychology- Clinical psychology and other mental health professions-Current issues in Clinical Psychology

Unit II: Current trends in Clinical Psychology

New approaches in psychopathology: Transdiagnostic perspective, Developmental pathway, Culture and psychopathology



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Developments in Clinical Assessment and Interventions: DSM 5 Cross-cutting symptom measures, Evidence-based assessment, Evidence-based psychotherapy, Innovative technologies in treatment delivery

Positive Psychology in Clinical Practice: Assumptions, Conceptual organization, Assessment, Evidence- based positive interventions

Unit III: Clinical Psychologist in various settings

Psychiatric settings: Assessment, Diagnosis and Psychosocial interventions. Working in a team.

Community settings: Need assessment, Resilience building in the community, Prevention Programs – Social Engineering for Change, Interventions for stigma reduction

Health/Hospital settings: Counseling, Consulting, Bio-psycho-social model of Health, Stress and Illness- Managing stress, Promoting healthy behaviours, Decreasing negative health behaviours

Educational settings: Clinical Psychologist as a Consultant – Teaming, Collaborating, Response-to-intervention Model

Unit IV: Ethical and legal considerations

General ethical principles (APA): Beneficence and Nonmaleficence, Fidelity and Responsibility, Integrity, Justice, Respect for People’s Rights and Dignity

Ethical standards: Resolving Ethical Issues, Competence, Human Relations, Privacy and Confidentiality, Advertising and Other Public Statements, Record Keeping and Fees, Education and Training, Research and Publication, Assessment, Therapy

Laws and guidelines: Mental healthcare act 2017; Rights of Persons with Disabilities Act, 2016; RCI Regulations and Act 2000

References

- American Psychological Association. (2010). Ethical Principles of Psychologists and Code of Conduct. <http://www.apa.org/ethics/code/principles.pdf>
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- Bhola, P., & Raguram, A. (Eds.) (2016). *Ethical Issues in Counselling and Psychotherapy Practice Walking the line*. New Delhi: Springer
- Clarke, D.E. & Kuhl, D.A. (2014). DSM 5 Cross-cutting symptom measures: A step towards the future of psychiatric care. *World Psychiatry*, 13(3), pp. 314-316.
- Duckworth, A. L., Steen, T. A., & Seligman, M.E.P. (2005) *Annual Review of Clinical Psychology*. 1:629–51
- Hecker, J. E. & Thorpe, G. L. (2011). *Introduction to Clinical psychology: Science, practice, and ethics*, (4th ed.), India: Dorling Kindersley Pvt. Ltd.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Korchin, J. S. (2004). *Modern clinical psychology: Principles of intervention in the clinic and community*.

CBS Publishing.

Pomerants, A. M. (2008). *Clinical Psychology: Science, practice and culture*, New Delhi: Sage Publications.

Rehabilitation Council of India (2000). RCI Amendment Act 2000. Retrieved from http://www.rehabcouncil.nic.in/writereaddata/RCI_Amendments_ACT.pdf

Reynolds, W. M., Miller, G. E., & Weiner, I. B. (2003). *Handbook of psychology: Volume 7 Educational psychology*. John Wiley & Sons.

Sarafino, P.E. (xxx) (3rd Ed) *Health Psychology: Bio- psychosocial interactions*, Taylor, E. (xxxx). *Health Psychology*. 2ndEdn, Mc graw Hill.

Wolman, B. B. (1965). *Handbook of clinical psychology*, N.Y: McGraw Hill INC.

Research Methodology

Research Methodology

UNIT I: Research

Basic concepts-meaning and characteristics of scientific research-factors affecting, steps or stages in research. Types of Research- Qualitative Research – Principles and Methods – Grounded theory – Thematic Analysis – Narrative approach – Quantitative research Experimental and Non experimental, Laboratory experiments and field experiments, True experiments and quasi experiments, Expost Facto research, Survey research - **Ethical problems in Research**.

UNIT II: Problem, Hypothesis and Variables

Meaning and characteristics of a problem, sources of stating a problem, considerations in selecting the problem, formulation of the problem and types of problems - Meaning and characteristics of a good hypothesis, Types of hypothesis, Errors in Hypothesis testing and formulation of Hypothesis - Meaning and types of variables, Consideration in the selection of variables, Control of extraneous variables-Techniques.

UNIT III: Review of Literature and Data Collection

Review of literature-Purpose, source and preparation of Index Card.

Data collection-Observation, Interview, Questionnaires and Psychological tests and scales.

UNIT IV: Designs, Analysis and Report Writing



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Meaning, purpose and criteria of research design; basic principles in Experimental design Types and their analysis techniques; Single subject and small N design-Pre, True and Quasi experimental designs and Expost Facto design.

Analysis of data: qualitative and quantitative analysis of the data purpose, conditions and interpretation of major parametric and non parametric statistical techniques.

General purpose of writing a report, structure and format of a report APA Style of writing, Typing, Evaluating a report and Preparing a research proposal. Personal computers – Statistical Software’s: SPSS - R -NVivo - Data base, Laboratory experiments using computers.

References

- American Psychological Association. (2019). *The publication manual of the American Psychological Association*. Seventh Edition. Washington, D. C. American Psychological Association
- Breakwell, G. M. et al. (2002.) *Research Methods in Psychology* London: Sage publications.
- Broota, K. D. (2001) *Experimental Designs in Behavioural Research*. New Delhi: Wiley Estern Ltd.
- Giri, A., & Biswas, D. (2019). *Research Methodology for Social Sciences*: New Delhi: Sage Texts.
- Goodwin, C. J. (2003). *Research in Psychology: Methods and Designs*. New York: John Wiley and Sons, Inc.
- Kerlinger, F.N. (2007) *Foundations of Behavioural Research*.
- Landau, S., & Everitt, B. S. (2004). *A handbook of Statistical Analysis using SPSS*. London: Chapman & Hall/Crc.

Bio Psychology

Bio Psychology

UNIT I: Organization and function of the nervous system

Structure and functions of cells of the nervous system- Neurons and action potential, Communication at synapse, Organization and function of the nervous system- Central nervous system: Brain: cerebral hemisphere (cerebrum), basal ganglia, thalamus, hypothalamus - Brain stem: medulla, pons, midbrain, reticular formation, cerebellum- Spinal cord: structure and functions, ascending (sensory) tracts, descending (motor) tracts- Cerebrospinal fluid. (CSF). Peripheral nervous system: Somatic nervous system- Autonomic nervous system.

UNIT II: Functional System

Limbic system: - Structure and Functions- Septum- Cingulate gyrus- Fornix Amygdala Hypocampal formation- Hypothalamus. Higher cortical functions of neocortex-



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Structure and functions of cerebral cortex: frontal lobe, temporal lobe, parietal lobe, occipital lobe.
Development and plasticity of brain. Method and strategies of research.

UNIT III: Biological basis of Cognitive processing

Learning, memory, amnesia and brain functioning, Storing information in the nervous system, Lateralization of functions, Evolution and physiology of language, Conscious and unconscious process and attention, Human communication.

UNIT IV: Biological basis of Regulatory mechanisms

Central, peripheral and intermediate mechanisms in emotion- Attack and escape behaviours, Motivation and electric stimulation of brain (ESB)- Categories of stress- Stress and coping strategies- Stress and endocrine system. Sexual behaviour, Temperature control, thirst and hunger, Sleep and biological rhythms.

References

Carlson, N.R. (2018). *Foundation of Behavioral Neurosciences*. India: Pearson India education services Pvt Ltd.
 Higgs, S., Cooper, A., Lee, J., & Harris, M. (2015). *Biological Psychology*. New Delhi: Sage Publications India Pvt Ltd
 Kalat, J. W. (2013). *Biological Psychology* (11th ed). New Delhi: Cengage Learning India Private Limited
 Kolb, B., & Whishaw, I .Q. (2011). *An introduction to brain and behaviour*. USA, Worth Publishers
 Pinel, J. P. (2006). *Biopsychology*, Doorsley Kindersley(India) Pvt Ltd.

Additional reading

Chaudari, S. K. (2006). *Concise Medical Physiology*, New Central Book Agency Pvt Ltd.
 Gayton, A. C., & Hall, J. E. (1996). *Textbook of Medical Physiology*, Bangalore: Prims Books Pvt Ltd.Elxvier India Pvt.
 Levinthal C. F. (1990). *Introduction To Physiological Psychology*(3rd Ed.), New Jersey: Prentice Hall, Engle Cliffs.
 Sembulingam, K. (1999). *Essential of Medical Physiology*(4th Ed.), New Delhi: Jaypee Brothers Medical Publishers (P) Ltd.
 Wangner, H. (2004). *Physiological Psychology* Special Indian Edition. Gaeland Science/Bios Scientific Publishers.



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Psychopathology - II

Psychopathology - II

Schizophrenia - Diagnostic criteria, Clinical features and Etiology - biological, psychosocial and psychoanalytic theories. Subtypes of Schizophrenia.

Other psychotic disorders - Schizoaffective disorder - clinical features.

Delusional Disorder - Diagnostic criteria, Clinical features and Etiology. Types of Delusional Disorders

Unit II: Mood Disorders

Major depressive disorder - Clinical Features, Specifiers and etiology - Genetics – Neurobiology

Psychodynamic Theories - Theories of Depression: Life Events Model - Lewinson's Behavioral and

Integrative Models - Coyne's - Interpersonal Model - Information Processing Models - Beck's Cognitive

Theory - Learned Helplessness. - Bipolar Affective disorder - clinical features of Mania, Bipolar I, Bipolar

II, Rapid cycling. - Dysthymia and Cyclothymia - clinical features

Unit III: Personality Disorders

Personality disorders - definition and general etiology - Biological and Psychoanalytic factors.

Subtypes of personality disorders - Diagnostic criteria of PDs under Clusters A, B and C. Cluster

A - Paranoid Personality disorder- Schizoid Personality disorder- Schizotypal Personality

disorder - Cluster B - Antisocial Personality disorder- Borderline Personality disorder- Histrionic

Personality disorder- Narcissistic Personality disorder - Cluster C - Avoidant Personality

disorder- Dependent Personality disorder- Obsessive- Compulsive Personality disorder

Unit IV: Substance dependence and related Disorders

Definitions of Abuse, Tolerance, Withdrawal, Addiction, Dependence and Codependence

Alcohol Use disorder - diagnostic features. Clinical features of - Alcohol intoxication and

withdrawal. Alcohol amnestic disorder, Delirium tremens. - Etiology of alcoholism - biological,

psychodynamic, behavioural and sociocultural factors. Effects of alcohol - Harmful effects of

some common substances - Caffeine, Cannabis and Opioids. Hallucinogens - effects of LSD,

PCP. Harmful effects of Benzodiazepines, Barbiturates and Cocaine

References

Carson, R.C., Butcher, J.N., & Mineka, S. (2014). *Abnormal psychology and modern life*. 16th edition.

Diagnostic and Statistical Manual-5 (2013). American Psychiatric Association.

Geddes, J.R., Andreasen, N.C. & Goodwin, G. M. (2020) *New Oxford Textbook of Psychiatry, III Edition*. University Press.

Kaplan, I. H & Sadock, J. B., (2015) *Synopsis of Psychiatry, Behavioural*



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Sciences/Clinical Psychiatry, 11th Edition. London: Lippincott Williams & Wilkins.
 Korchin, J. S. (2004). *Modern clinical psychology: Principles of intervention in the clinic and community.* CBS Publishing Co.
 Sarason, L. G., & Sarason, B. R., (2002) *Abnormal Psychology: the problem of maladaptive Behaviors.* Singapore: Pearson Education.
 Wenar, C., & Kerig, P. (2000). *Developmental Psychopathology: From Infancy through Adolescence* (4th ed.), Singapore: The McGraw-Hill Co. Inc.

Counselling Psychology

Counselling Psychology

UNIT I: Introduction to Counselling:

Definition- Distinction Between Counseling and Psychotherapy -Goals of counseling -
 Historical and Professional Foundations of Counseling - Counseling process and methods –
 Characteristics of a helping relationship- Characteristics of an Effective Counseling
 relationships- Counseling Procedures/Skills: Initial procedures, the initial counseling
 Interview, and counseling skills. Counseling Procedures/Skill-II: Advanced Empathy,
 selfdisclosure and Interpretation; Action strategies: Role playing, Behavioural techniques,
 Decision-making Methodologies and problem – solving strategies.

UNIT II: Counselling Process and Theories

Building counseling relationships – Working in a counseling relationships – Termination of
 counseling relationships – Behavioral – Cognitive – Client Centered – existential and eclectic
 approaches.

UNIT III: Counselling in Diverse Populations and Specialties

Counselling Aged Populations – Gender based counseling – Counselling and spirituality.
 Career counseling – Marriage, couple and family counseling- Professional School counseling
 – Abuse, Disability and community Counselling. Principles and procedures of Group
 counseling.

UNIT IV: Training and Research in Counselling Psychology

Role of relaxation in counseling- Guided Somato Psychic Relaxation (GSPR) - Jacobson’s
 Progressive Muscular Relaxation.- Yoga relaxation - EEG, EMG, Bio- feedback relaxation
 Transcendental Meditation - Research and Evaluation: Testing, assessment and diagnosis
 Professional Issues in counseling- Evaluation of counseling- purpose, Difficulties and criteria -
 Ethical and Legal Aspects of counselling



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References

- Capuzzi, D., & Gross, D. R. (2008). *Counseling and Psychotherapy. Theories and Interventions*. New Delhi: Person.
- George, L. R., & Cristiani, T. (1981). *Theory, Methods of processes of counseling and Psycho therapy*. New Jersey: Prentice Hall Inc. Englewood and Cliffs.
- Gladding, S. T. (2013). *Counseling, A Comprehensive Profession (7th Ed)*. Pearson: New Delhi.
- Kottler, J. A., & Brown, R. W. (2000). *In introduction to therapeutic counseling (4th Ed)*. California Brooks/Cole Publishing Company.
- McLeod, J. (2003). *An Introduction to Counselling (3rd Ed)*. New York: Open University Press.
- Patterson, E. L., & Welfel, E. R. (1999). *The Counselling Process (5th Ed)*. California: Brooks/Cole Publishing Company.
- Sreedhar, K. P. (1996). *Guided Somato-Psychic Relaxation: Trivandrum: LIFE*.

Psychotherapeutics - I

Psychotherapeutics - I

UNIT I: Introduction to Psychotherapy

Definition- Essential process in psychotherapy- Types of psychotherapy- Phases in psychotherapy. Goals of psychotherapy. Basic ingredients of psychotherapy. **Ethical issues in psychotherapy.**

UNIT II: Psychoanalysis

Basic concepts- Mechanism of psychotherapy- Opening phase- Development of transference Working through- Resolution of transference
Brief Dynamic Therapy

UNIT III: Third Force Therapies

Humanistic, Existential therapies: Basic principles
Client-centered therapy-Logotherapy- Gestalt therapy

UNIT IV: Specific Therapies

Family therapy- Marital therapy- Group therapy- Crisis intervention therapy Interpersonal therapy(IPT)- Dialectical behavioral therapy-Basic principles



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References

- Gambrill, E. (1975). *Behavior Modification Handbook of assessment, intervention and evaluation*. San Francisco: Jossey Ban publishing
- Kaplan H. et al. (ed) (1980) *Comprehensive Textbook of Psychiatry*. London: Williams and Wilkins.
- Korchin, S.J. (1986). *Modern Clinical Psychology*. Delhi: CBS Publishers & Distributors.
- Meichenbaum, D. (1977). *Cognitive-Behavior Modification*
- Whaley, D. L. (1971). *Elementary principles of behavior*. New Jersey: Prentice Hall. Inc.
- Wolpe, J. (1973). *The Practice of Behavior Therapy*. New York: Pergaman Press.

Neuropsychology

Neuropsychology

UNIT I. Introduction

Historical background of Neuropsychology - Areas of Neuropsychology - Research Studies of the 19th Century - **Techniques of Neuropsychological testing**.

UNIT II. Anatomical and Functional Organisations

The frontal lobe: Specific functions of frontal lobe, prefrontal/cortex, Broca's area, Orbital centre, lateralization in the frontal lobe Intelligence and frontal lobe.

The temporal lobe: Specific functions of temporal lobe; audition, vision, language, attention, memory and personality.

The parietal lobe: specific functions of parietal lobe, somato sensory perceptions, tactile perception and body sense, language and spatial orientation, short-term memory and parietal lobe.

The occipital lobe: Anatomical divisions, basic visual functions and visuo -perceptual functions.

UNIT III: The Limbic System

Hypothalamus: Lateral and ventro medial nucleus-Hunger, thirst, pleasure and reward, and aversion.

Amygdala: Medial and later all nuclei-Attention, Fear, Rage, Aggression, Emotional language and the Amygdala, the limbic system and **testosterone, sexual orientation and heterosexual device, the homosexual limbic system**.



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Hippocampus: Arousal, Attention and Inhibition, Learning and Memory.

UNIT IV: Hemispheric Asymmetry

Individual variation in anatomical asymmetry-Sex differences and Environmental effects. Concept of cerebral dominance: Visual, visuospatial, tactile and auditory perception, language and memory. Agencies of the corpus callosum – Functional asymmetry of normal subjects.

References

- Joseph, R. (1996). *Neuropsychology, Neuropsychiatry and Clinical Neuroscience*. Williams and Wilkins, London.
- Kolb, B., & Whishaw, I. Q. (1999). *Fundamentals of Neuropsychology (4th ed)*, New York: Freeman & Company.
- Mazziotta, J. C. (2000). *Brain Mapping: The Systems*. Frackowak: Academic Press.
- Schneider, M., & Tarshes, B. (1986). *Introduction to Physiological Psychology*, New York: Random House.
- Walsh, K. (1994). *Neuropsychology (Lt)*, London: Churchill Livingstone, Edinburgh.

Health Psychology

Health Psychology

UNIT I: Hospital Setting

- Emotional Adjustment During Hospitalization.
- Role of Psychologist in Hospitals.
- Patient Practitioner Relationship.
- Health and Behaviour.

UNIT II: Stress, Psychosocial factors and Illness

- Stress and Health.
- Psycho physiological disorders.
- Cardiovascular Desires caner.
- Stress and cancer.

UNIT III: Coping with high mortality Illness

- Behavioural Causes.
- Coping, High mortality Illness.
- Terminal Illness & Quality of Life.



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- d) Accidents Victims

UNIT IV: Mental Health Promotion Programmes

- a) Promoting Health in Organization.
- b) Community wide wellness Programmers.
- c) Meditation and Relaxation Techniques.
- d) Stress Management Techniques.

References

Sarafins, E. P. (1998) *Health Psychology* New York: John Willey & Sons. Taylor, S. E. (2000) *Health Psychology*. New York: Mc Grew Hill one.

Broome, A., & Lhwelyn, S. (2010) *Health Psychology- Process and Application* . New York: Chapman & Hall.

Singh, R. (2005). *Health Psychology*. New Delhi: Global vision Publishing Home.

Mantin, G., & Pean, J. (2003). *Behaviour Modification*. New Delhi Prentice Hall India.

Psychotherapeutics – II

Psychotherapeutics – II

Unit I: Behavior Modification-I

Classical, Operant and Vicarious Conditioning.

Behaviour Therapy - Basic concepts- Process- Establishing a working relationship- Functional analysis How to select a target behavior- Stages of therapy- Modification process

Behavior modification techniques: Desensitization and Extinction procedures- In-vivo and in-vitro Graded Exposure – Flooding and Implosion- Response Prevention.

Unit II: Behavior Modification-II

Operant Procedures: Token economy- Contingency Management- Social Skills Training: Assertiveness training- Modeling- Aversion Therapy: Chemical Aversion and Verbal Aversion

Unit III: Relaxation, Meditation and Biofeedback

Relaxation Techniques: Jacobson’s Progressive Muscle Relaxation- Breathing exercise- Meditation- Biofeedback techniques

Unit IV: Cognitive Therapy



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Cognitive view of psychopathology- Clinical assessment- Process of Cognitive therapy
Rational Emotive Behavior Therapy- Cognitive Behavior Therapy- Stress Inoculation New
wave therapies – Mindfulness based Therapies, Acceptance and Commitment Therapy.

References

- Carson, C. R, Butcher, J. N., & Mineka, S. (2014). *Abnormal Psychology and Modern Life*. London: Harper Collins College Publishers
- Garfield & Bergin, A.E. (1986). *Handbook of psychotherapy and Behavior*. John Willey and Wilkins.
- Kaplan, H. et al. (2007). *Comprehensive Textbook of Psychiatry*. London: Williams and Wilkins.
- Korchin,
- Rimm, D. C. & Masters, J. C. (1979). *Behavior Therapy*.
- Wolberg, R. L. (1967). *The Technique of Psychotherapy*. Grune & Stratton, INC
- Corey, G. (2009). *Theory and Practice of Counselling and Psychotherapy*. (8th Ed). USA: Thomson Brooks/Cole
- Bonger, B., & Beutler, E. L. (1995). *Comprehensive Textbook of Psychotherapy theory and Practice*. Oxford University Press
- Gambrill, E. (1975) *Modification Handbook of Oassessment, intervention and evaluation*. San Francisco: Jossey Ban publishing
- Meichenbaum, D. (1977) *Cognitive-Behavior Modification*
- Whaley, D. L. (1971). *Elementary principles of behavior*. New Jersey: Prentice Hall. Inc.
- Wolpe, J. (1973) *The Practice of Behavior Therapy*. New York: Pergaman Press.

Forensic Clinical Psychology

Forensic Clinical Psychology

Unit I: Introduction to consulting and community psychology

History of consulting psychology; Key concepts; Levels of consultation (Individual level, group level, organizational level, Leadership and consultation, Role of culture in consultation, Models of consultation. Community psychology – introduction; historical background of community psychology; Theories in community psychology; Core values; empowerment, social constructionism, and liberation in community psychology. Levels of analysis; psychological level; organizational level; community level; ecological views on community psychology.

Unit II: Community psychology social change

Prevention and promotion in community settings; Key concepts; effectiveness of prevention and promotion programs; Development and evaluation of prevention and promotion programs in community settings.



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Promoting community and social change – community empowerment; practices and settings of empowerment; community change programs and interventions; model/s of community change programs; essential elements of effective community change programs.

Emerging trends in community psychology; challenges and consensus.

Unit III: Community psychology in context

Community psychology and special populations - ethnic minorities; urban poor; lesbian, gay and bisexual issues; immigrants; people with HIV/AIDS; persons with disabilities. Community psychology and special issues – environmental issues; unemployment; substance abuse prevention; violence prevention; peace and development.

Human diversity and community psychology; Health and community psychology; Community mental health; Ethical standards in consulting and community psychology.

Unit IV: Research in consulting and community psychology

Aims of research in consulting and community psychology; values and assumptions in research.

Levels of community and community research; Methods of research in consulting and community psychology (qualitative and quantitative methods); Community research areas.

(Assignment – The student has to submit a write-up on an area of his/her choosing from consulting and community psychology. The write-up should be no less than 2500 words and no more than 3000 words)

References

Kazdin, A. E. (2000). *Encyclopedia of Psychology*: 8 Volume Set. American Psychological Association.

Kloos, B., Hill, J., Wandersman, A., Elias, M. J., & Dalton, J. H. (2012) (3rd Ed). *Community Psychology: Linking Individuals and Communities*, Wadsworth, CengageLearning, Belmont, CA.

Lowman, R. L. (2016). *An Introduction to Consulting Psychology: Working With Individuals, Groups, and Organizations*. American Psychological Association.

Maton, K. I. (xxxx). Community psychology. In, C. Spielberger (Ed). *Encyclopedia of applied psychology*. Elsevier Academic Press.

Nelson, G., Kloos, B., & Ornelas, J. (2014). *Community Psychology and Community Mental Health*. Oxford University Press: New York.

Orford, J. (2008). *Community Psychology: Challenges, Controversies and Emerging Consensus*. John Wiley & Sons Ltd: West Sussex, England.

Rappaport, J. & Seidman, E. (2000). *Handbook of community psychology*. SpringerScience+Business Media: New York.

Scileppi, J A, Teed, E. L., & Torres, R. D. (2000). *Community Psychology: A common sense approach to mental health*. Upper Saddle River, NJ: Prentice Hall.



CRITERION	I	Curricular Aspects
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Viljoen, H, Grieve, K, Van Straden, F & Van Deventer, V (1992). *Environmental psychology: An introduction*. Johannesburg: Lexicon Publishers.

Physical Geology and Geomorphology

GEL 1C 01 Physical Geology and Geomorphology

Module 1:

- Earth and the solar system, Meteorites and other extra-terrestrial materials, Planetary evolution of the earth. Heterogeneity of the earth's crust. Major tectonic features of the Oceanic and Continental crust.
- Thermal history of the Earth - Geothermal gradient. Heat budget of the earth, Heat flow.

Module 2:

- Gravity measurements. Positive and negative gravity anomalies. Geoid, spheroid; Isostasy
- Basic concepts of seismology and internal structure of the earth. Physico-chemical and seismic properties of the earth's interior. Modern techniques for prediction of earthquakes.

Module 3:

- Geomorphic principles and processes. Theory of uniformitarianism. Control of geomorphological features by geologic structures, lithology, climate and time. Geomorphic cycles. Models of landscape evolution.
- Streams-stream hydraulics- Drainage basin, Morphometric analysis of drainage basins. Fluvial-denudational and erosional landforms. Concept of rejuvenation and interruptions in the evolution of land.
- Coastal Geomorphology. Landforms of wave erosion and deposition. Beach Profiling
- Desert Geomorphology – Processes of erosion and transport – erosional and depositional features – dunes, rock varnish, pediment, inselbergs, wadis

Module 4:

- Wetlands- Geological significance, classification and mode of formation. The Indian scenario - conservation and management in India. Backwaters (Kayals) of Kerala. Soils- formation, classification, soil profile, soils of India and Kerala.
- Geomorphology of Kerala- classification, relief features, geological Significance, rivers of Kerala. Geomorphic features of the Indian subcontinent.

Module 5:

- Hill slopes- forms in relation to lithology and structural weakness in rocks; control and mass movement, modification by overland flow of hill slopes. Slope stability.
- Applied Geomorphology: Application of Geomorphology in Civil Engineering, Hydrogeology, and



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Environmental Studies.

Essential Reading:

1. Ahamed, E., 1972. *Coastal Geomorphology of India*. Orient Longman, New Delhi.
2. Cox. A. Plate tectonics and geomagnetic reversals, Freeman, 1973
3. Eicher.L.D., Geologic Time, Prentice Hall, 1968
4. Hamilton, E. I., Applied geochronology, Academic Press, 1965
5. Holmes, A. Principles of Physical Geology, Ronald, London, 1972
6. King, C.A.M. Beaches and Coasts, Arnold, London, 1972
7. Leopold, L. Wolmen, C. and Miller J.P. Fluvial processes in Geomorphology, EPH Publishing House, New Delhi, 1976
8. Pethick, J., An introduction to coastal geomorphology, Arnold Heinman publishers, (India),New Delhi, 1984
9. Schumm, S .A. (Ed), Drainage Basin morphology- In Bench mark papers in Geology
10. Shartna, H. S.s Indian geomorphology, Concept Publishing .Co, New Delhi, 1990
11. Thornbury, W.D. Principles of Geomorphology, Wiley, 1968
12. Windley, B.F., The evolving continents, John Wiley, & Sons
13. Savindra Singh, Geomorphology, Pravalika publications, Allahabad

Structural Geology and Geotectonics

GEL 1C 02 Structural Geology And Geotectonics

Module 1:

- Geological mapping and map reading; Attitudes of planes and lines and their representation.
- Brittle and ductile deformation; Behaviour of minerals and rocks under deformation conditions; Rheology.
- Concept of stress and strain; Relationships for elastic, plastic and viscous materials; Strain and displacement; Graphical representation of finite strain: Strain ellipsoid; Flinn diagram and Mohr Circle.
- **Folds: Mechanics of folding; Geometric classification after Ramsay; Genetic classification after Donath and Parker; Minor folds and their uses in determining the major fold structure; Pumpelley's rule.**
- **Superposed folding and interference patterns**

Module 2:

- **Joints and fractures: Distinction; Joint formation in response to loading and stress; Fracture development and propagation; Classification of joints and extension fractures.**
- **Faults: Dynamics of faulting; Displacement, slip and separation; Fault geometry and classification; Characteristics of faults and fault zones.**
- **Crustal scale faults: Strike-slip, transpression, and transtension**



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Module 3:

- Tectonites: Fabric elements and classification; S-C fabric; Petrofabric analysis.
- **Shear Zones: Brittle and ductile shear zones, geometry and products of shear zones; shearsense indicators; Mylonites and cataclasites, their origin and significance.**
- Stereographic projections: linear and planar features.

Module 4:

- Physico-chemical and seismic properties of earth's interior.
- Comparisons of terrestrial planetary interiors.
- **Major tectonic features of the earth: Birth and growth of Ocean basins and Continental crust;**
- Tectonic evolution of Earth's continental crust; Hadean, Archaean, and post-Archaean continental crust.
- Introduction to planetary tectonics.

Module 5:

- Plate tectonic system in Earth: Lithosphere-Asthenosphere system; Driving mechanism;
- Mantle convection; Heat transfer and tectonics
- Plate kinematics: Relative motion of plates on a sphere; Finite and absolute plate motions.
- **Kinds of plate movements and features associated with plate interactions.**

Module 6:

- Orogens: Tectonic elements of Collisional; Accretionary; Intracratonic orogens.
- Mid-Ocean ridges: Composition and Structure; Magnetic anomaly stripes
- Continental shield areas and mountain chains
- Palaeomagnetism and its application for determining palaeoposition of continents.
- Geodynamic evolution of the Indian plate

Essential Reading:

1. Artemieva, I.M., 2011. *The Lithosphere- An Interdisciplinary Approach*. Cambridge University Press, 773 p.
2. Condie, K.C., 2011. *Earth as an Evolving Planetary System*, Academic Press, Oxford, UK, 574p.
3. Davis, G.H., Reynolds, S.J., Kluth, C.F., 2012. *Structural Geology of Rocks and Regions*. 3rd Edition, John Wiley & Sons, Inc. 839 p.
4. Fossen, H., 2010. *Structural Geology*. Cambridge University Press, 463 p.
5. Frisch, W., Meschede, M., and Blakey, R., 2011. *Plate Tectonics: Continental Drift and Mountain Building*, Springer-Verlag, Berlin Heidelberg, 212p.
6. Ghosh, S.K., 1993. *Structural Geology: Fundamentals and Modern Concepts*. Pergamon Press, Inc., 598 p.
7. Marshak, S., Mitra, G., 2018. *Basic Methods of Structural Geology*. Pearson Education, 446 p.
8. Moores, E.M., Twiss, R.J., 2014. *Tectonics*. W.H. Freeman, 672 p.
9. Passchier, C.W., Trouw, R.A.J., 2005. *Microtectonics*. Springer-Verlag, 366 p.
10. Stüwe, K., 2007. *Geodynamics of the Lithosphere*. Springer-Verlag, 493 p.



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

11. Turcotte, D.L. and Schubert, G., 2014. *Geodynamics*, 3rd Edition, Cambridge University Press, 636 p.
Van der Pluijm, B.A., Marshak, S., 2004. *Earth Structure: An Introduction to Structural Geology and Tectonics*. W.W. Norton & Company, Inc., 656 p.

Geoinformatics

GEL 1C 03 - Geoinformatics

module 1:

- Brief history and development of remote sensing. Geometry and type of aerial photographs. Scale of photographs.
- Tilt and height displacement. Vertical exaggeration. Stereoscopy. Mosaics.
- Elements of photo interpretation: tone, texture, pattern, drainage and lineaments.

Module 2:

- Electromagnetic spectrum, Methods of Energy Transfer.
- Principles of Satellite Remote Sensing. Platforms and sensors.
- Resolution concepts- Spatial, Spectral, Radiometric and Temporal resolution. Multi Spectral Scanners (MSS).
- Spectral signatures. Indian remote sensing satellite missions.

Module 3:

- Principles and applications of thermal detectors, Thermal Infra Red scanners- airborne and space borne TIR sensors. Microwave remote sensing, RADAR
- Application of remote sensing in mineral exploration, ground water exploration, land use /land cover mapping and geomorphology.

Module 4:

- Fundamentals of digital image processing and classification: Image rectification and restoration.
- Image enhancement: contrast stretching, filtering, PCA images, FCC, Image ratioing.
- Image classification and accuracy assessment - supervised & unsupervised classification

Module 5:

- **Geographic Information Systems (GIS). GIS as a tool to integrate information, technologies and theoretical areas.** History of GIS.
- Fundamentals of cartography and geodesy. Geographical data. Data and information. Types of



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information. Subdivision of information. Layers. Geographical information models.

- Data sources. Software and technology. Desktop GIS. Five fundamental functionalities of a desktop GIS: data input and output, visualization, editing, analysis, and map design. Web mapping. Clients and servers. Mobile GIS.

Module 6:

- Databases. Relational databases. Database management systems. Queries.
- Spatial analysis. Spatial queries. Topological analysis. Measurement. Combination. Transformations. Terrain analysis. Descriptive statistics. Inference. Optimization and decision-making.
- Visualization of geographical data. Basic ideas about data visualization. Maps and cartographic communication. Types of thematic maps. Visualization in a GIS.
- GIS Applications in urban planning, groundwater studies, mineral exploration, disaster management, climate change analysis

Essential Reading:

1. Avery, T.E. Interpretation of aerial photographs, Burges Publishing Co 1968
2. Estes, J.W. and Leslie W. Senger, Remote Sensing - Techniques for Environmental analysis, Hamilton Publishing Co., 1974
3. Ravi P Gupta Remote sensing geology, 2nd edition, Springer, 2003
4. Thomas M. Lilesand, and Ralph W. Keiferr. Remote Sensing and Image Interpretation, JohnWiley and Sons 1979
5. Shiv N Pandey, Principles and Applications of Photogeology, New age InternationalPublishers, 2007
6. John R Jesnsen, Remote sensing of the environment, University of Carolina, PearsonEducations
7. Avery, T.E. Interpretation of aerial photographs, Burges Publishing Co 1968
8. Burrow, P. A. and Mc Donnel, R. A. Principles of Geographic Information Systems, Oxford Publishers, 1998
9. Clark, K.C. Getting started with Geographic Information System, Prentice Hall,1990
10. Demer, M.N. Fundamentals of GIS, John Wiley & Sons, 2000.
11. ESRI. Understanding Geographic Information System. The Arc Info Method, Wiley Publishers
12. Heywood, 1. Cornelius, S. and Canver, S. An introduction to Geographical InformationSystem, Pearson Education Asia Pvt. Ltd. 1993
13. Peter A. Burrough and Ruchael, A. McDonnell, Principles of Geographical InformationSystem, Oxford Publishers
1. 14. Star, J. Ester, J. Geographic Information System - An introduction, Prentice Hall,1990



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

Stratigraphy And Indian Geology

GEL 1C 04 - Stratigraphy And Indian Geology

Module 1:

- Stratigraphic principles and evolution. Contributions of Steno, Lehmann, Fushel, Werner, Hutton, Lyell and Smith.
- Recent developments in stratigraphic classification. Code of stratigraphic nomenclature – Stratotypes, Global Boundary Stratotype Sections and Points (GSSP). Lithostratigraphic, chronostratigraphic and biostratigraphic subdivisions. Methods of stratigraphic correlation including Shaw's Graphic correlation.

Module 2 :

- Elements of Magnetostratigraphy, cyclostratigraphy, pedostratigraphy, chemostratigraphy and sequence stratigraphy.
- Major geological events during the different periods of earth history. Mass extinction - Meteoric impact Theory - Volcanic eruption theory.

Module 3:

- Pre-Cambrian stratigraphy. Classification of Indian Pre-Cambrian with particular reference to Karnataka and Kerala. Greenstone belts and granulites of South India. Classification, lithology, ages, correlation of Sargur schist, Dharwar Supergroup, Cuddapah Supergroup and Vindhyan Supergroups.

Module 4

- Phanerozoic stratigraphy of India with reference to the type areas– their correlation with equivalent formations in other regions. Rise of the Himalayas and Evolution of Siwalik

Module 5

- Stratigraphic boundary problems with reference to Indian subcontinent - Vindhyan, Saline Series and Deccan Traps.

Essential Reading:

1. Arkell, W. J., Jurassic Geology of the World, Oliver and Boyd, 1960
2. Dunbar, CO., and Rogers, J., Principles of Stratigraphy, Wiley, 1961
3. Eicher L.D., Geologic Time, Prentice Hall, 1968
4. Flint, R.F., Glacial and Pleistocene Geology, Wiley, 1961
5. Gignoux M., Stratigraphic Geology, Freeman, 1960
6. Gupta V.J., Cenozoic Stratigraphy of India, Hindustan Publishing House, 1975



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

7. Gupta V.J., Mesozoic Stratigraphy of India, Hindustan Publishing House, 1976
8. Gupta V.J., Precambrian Stratigraphy of India, Hindustan Publishing House, 1977
9. Hamilton, E. I., Applied Geochronology, 1 Edn., Academic Press, 1965
10. Key and Colbert, Stratigraphy and Life History, Wiley, 1965
11. Krishnan, M.S., Geology of India and Burma, Higgin Bothams, 1968
12. Kruinbein, W.C., and Sloss L. D., Stratigraphy and Sedimentation, Freeman, 1963
13. Moore R.C., An introduction to Historical Geology, McGraw Hill, 1958
14. Pichamuthu, C. S., Archaean Geology, Oxford I.B.B., 1985
15. Sarkar, S. N., Stratigraphy and Geochronology of Peninsular India, 1 Edn., Dhanbad Publications, 1968
16. Weller, Stratigraphic Principles and Practice, Harper and Row, 1959
17. Windley, B. F., The Evolving Continents, 1 Edn., John Wiley, 1977
18. Ramakrishnan & Vaidhyanathan, Geology of India, Geological Society of India Publication, 2008

Crystallography And Mineralogy

GEL 2C 05 - Crystallography And Mineralogy

Module 1:

- Crystallography-Crystalline state-Repetition theory. Translation periodicity of crystals. Basic rotational symmetries and possibility of simultaneous rotational symmetries in different directions of crystals-symmetrical plane and symmetrical lattices.
- Derivation of 32 crystal classes. Stereographic projection of crystals.

Module 2:

- Crystal notation- Schoenflies notation. Herman Mauguin symbols-comparison between Schoenflies and International notations.
- Calculation of crystal elements to test the knowledge of the application of tangent relation, anharmonic ratios, Napier's theorem and equation of the normal.
- X-ray diffraction method- basic principles. X-ray diffractometer- Powder methods- Bragg's law and its application- Calculation of cell dimensions-identification of minerals from X-ray diffraction patterns.

Module 4:

- Plane polarized and cross polarized light; Behaviour of isotropic and anisotropic minerals in polarized light.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Double refraction; Refractive index; Birefringence; Interference colours and determination of order.
- Conoscopic observations of minerals under petrological microscope: Formation of interference figures; Uniaxial and biaxial interference figures; Determination of the Optic sign of uniaxial and biaxial minerals.
- Optical indicatrices of uniaxial and biaxial minerals.
- Vibration directions and sign of elongation in minerals. Extinction and extinction angle. Determination of Optic axial angle (2V).

Module 5:

- Structural and chemical principles of minerals: chemical bonds; ionic radii; coordination number (CN).
- Structure, chemistry, physical and optical characters and paragenesis of mineral groups: Olivine, pyroxene, amphibole, mica and spinel groups; Feldspar, quartz, feldspathoid, aluminum silicate, epidote, garnet and zeolite groups. Accessory minerals: Apatite, calcite, corundum, scapolite, sphene and zircon.

Module 6:

- Earth mineralogy: Average mineralogical composition of crust and mantle.
- Mineral transformations in the mantle with depth

Essential Reading:

1. Dyar, M.D., Gunter, M.E., 2007. *Mineralogy and Optical Mineralogy*. Min. Soc. America, 705p.
2. Demange, M., 2012. *Mineralogy for Petrologists: Optics, Chemistry, and Occurrence of Rock Forming Minerals*. CRC Press (Taylor & Francis Group), 182 p.
3. Nesse, W.D., 2012. *Introduction to Optical Mineralogy*. Oxford University Press; 4 edition, 384p.
4. Pichler, H., Riegraf, C.S., 2011. *Rock-forming Minerals in Thin Section*. Springer, 220 p.
5. Deer, W.A., Howie, R.A., Zussman, J., 2013. *Introduction to the Rock-forming Minerals*. Mineralogical Society of Great Britain & Ireland, 510 p.

Economic Geology

GEL 2C 06 - Economic Geology

Module 1:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Ore, Tenor, grade and specification for minerals.
- Classification of ore deposits - Lindgren and Bateman classifications
- Ore microscope- polishing and mounting of ores. Physical and optical properties of important ore minerals. Textures and structures of ore and gangue minerals.
- Fluid inclusions studies

Module 2:

- Metallogenic epochs and provinces, Strata bound and stratiform ore deposits - distribution, form, setting and origin. Mineralization at plate boundaries, Ore forming solutions and their migration. Wall rock alteration.
- Major theories of ore genesis. Paragenetic sequences, Zoning, Controls of ore localization.

Module 3:

- Ores in igneous rocks - ores of mafic and ultramafic associations - Ultra mafic-mafic chromium platinoid associations - form, distribution, setting, constitution and origin. Ores of felsic associations – the carbonatite associations - form, distribution, setting, constitution and origin. Anorthosite - Fe- Titanium oxide association, distribution, form, setting, constitution and origin

Module 4:

- Genetic classification of U and Th deposits. Geology and genesis of U deposits of Jaduguda. Pb-Zn deposits of Rajasthan, Cu deposits of Singhbhum and Malanjkhand, East Coast Bauxite, Iron ore deposits of Bailadila and Kudremukh.
- Strategic, critical and essential minerals of India.
- National Mineral Policy of India

Module 5:

- Coal Geology classification, petrography, genesis and periods of coal formation Distribution of coal fields of India, Neyveli Lignite Field.
- Petroleum Geology Introduction- physical properties and chemical composition, occurrence and origin. Source materials and source locations -conversion to petroleum. Reservoir rocks classification of reservoir traps -general, structural, stratigraphic, salt domes. Distribution of oil fields in India.
- A brief introduction to gas hydrates.

Essential Reading:

1. Anthony, M. Evans, An introduction to Ore Geology, Blackwell Scientific Publication, 1980
2. Ashok Mukherji, Ore Genesis - A Holistic approach, Prentice Hall, Calcutta
3. Bateman A. M., Economic Mineral Deposits, Wiley, 1962
4. Brian Mason, Principles of Geochemistry, Wiley, 1966



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

5. Brown, J. C, and Dey, A. K., India's Mineral Wealth, Oxford, 1936
6. Cameron, E. N., Ore Microscopy, Wiley, 1961
7. Edwards, A. B., Textures of the Ore Minerals, Aus. Inst. Min. and Met. 1960
8. Jenson and A. M. Bateman, Economic Mineral deposits, 111 Edn. John Wiley
9. Krauskopf, K., Introduction to Geochemistry, McGraw Hill, 1967
10. Levorson, A. I., Geology of Petroleum, McGraw Hill, 1958
11. Lindgren, Mineral Deposits, McGraw Hill, 1933
12. Nininger, R. D., Minerals for atomic energy, von Nostrand, 1956
13. Park C. G., and Mac Diarmid, R. A. Ore Deposits, Freeman, 1964
14. Rankama, K., and Sahama, T. G., Geochemistry, Chicago Uty. Press, 1949
15. Stanton, R. K., Ore Petrology, McGraw Hi 11, 1972
16. Tissot, B. P., and Welta, D. H., Petroleum formation and occurrence, Springer Verlag, 1978
17. Van Krccsalon, D.. Coal, Elsevier, 1961

Hydrogeology

GEL 2C 07 - Hydrogeology

Module 1:

origin of water: meteoric juvenile magmatic precipitation, runoff, infiltration and evapotranspiration, Hydrographs Subsurface movement and vertical distribution of groundwater, Springs. Classification of aquifers. Concepts of drainage basin and groundwater basin.

- Hydrological properties of rocks – specific yield, specific retention, porosity, hydraulic conductivity, transmissivity, storage coefficient. Determination of permeability in laboratory and in field. Water table fluctuations – causative factors, concept of barometric and tidal efficiencies. Water table contour maps.

Module 2:

- Theory of groundwater flow. Forces causing ground water movements. Darcy's Law and its applications.
- Unconfined, confined, steady, unsteady and radial flow conditions. Pump tests – methods, data analysis and interpretation for hydrogeologic boundaries. Evaluation of aquifer parameters using Thiem, Theis, Jacob and Walton methods.

Module 3:

- Groundwater quality – physical and chemical properties of water. Quality criteria for different uses - domestic, irrigation and industrial. Graphical presentation of water quality data - Stiff diagram, Pie diagram, Piper's trilinear diagram and USSL diagram.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Problems of arsenic and fluoride in groundwater. Saline water intrusion in coastal and other aquifers. Ghyben-Herzberg relation. Prevention and control of saline water intrusion. Radioisotopes in hydrogeological studies.

Module 4:

- Ground water exploration -Geologic and hydrogeologic methods. Surface geophysical methods – electrical resistivity method: Wenner and Schlumberger configurations for vertical electrical sounding.
- Subsurface geophysical methods – well logging for delineation of aquifers. Remote sensing for groundwater exploration - hydrogeomorphic mapping of the terrain using different images of different satellite missions, lineament mapping, shallow groundwater potential zone mapping using satellite images.

Module 5:

- Types of wells, drilling methods, construction, design, development and maintenance of wells, specific capacity and its determination.
- Groundwater problems related to foundation work, mining, canals and tunnels. Problems of over exploitation and groundwater mining. Groundwater development in urban areas and rain water harvesting, Artificial recharge methods.
- Groundwater provinces of India.

Essential Reading:

1. Bouwer, H Groundwater Hydrology. 1978
2. Davies and De Wiest, Hydrogeology, John Wiley and Sons, 1966
3. Dominico, P. A.. Concepts and models in Groundwater Hydrogeology, McGrawHill
4. Fletcher, G. Driscoll, Groundwater and wells, Science Publ., Jodhpur, 1986
5. Karanth, K. R., Groundwater and wells, Science Publ., Jodhpur, 1986
6. Linsley, R. K., Jkoller, M. A., and Paulhus, J. L. H., Applied Hydrology, Tata McGrawHill, 1975
7. Raghunath, H. M., Groundwater, Wiley Eastern, 1987
8. Todd, D. K., Groundwater Hydrology, John Wiley and Sons, 1980
9. Tolman, C. F., Groundwater, McGraw Hill
10. Walton, W. C, Groundwater Resource Evaluation, McGraw Hill, 1970
11. Freeze and Cherry – Groundwater.

Applied Palaeontology And Sedimentology

GEL 2C 08 - Applied Palaeontology And Sedimentology

Module 1:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Fossils and fossilisation Definition and morphology. Modes of preservation and geometry of fossils. Physico- chemical conditions of fossilisation. Significance of fossils.

Module 2:

- Vertebrate paleontology: Succession of vertebrate life through geologic time. Broad classification.
- General characteristics and Evolution histories of Dinosaurs, Equus, Elephus and Man.

Module 3:

- Micropalaeontology - Scope and classification of microfossils.
- Techniques in collection, separation, preparation and preservation of microfossils
- Classification, morphology, ecology, palaeoecology and stratigraphic importance of the following -Foraminifera, Ostracoda, Bryozoa, Radiolaria, Diatoms and Conodonts.
- Palynology: General morphology of spores and pollens –classifications. geological significance and Application
- Application of microfossils in the petroleum exploration, palaeoenvironments, Palaeoecology and Palaeoclimate. Estimation of Palaeotemperature

Module 4:

- Sedimentary processes, lithification and diagenesis of siliceous and Carbonate sediments. Elements of Hydraulics - behaviour of particles in fluids.
- Heavy minerals and their significance in Provenance studies.

Module 5:

- Sedimentary Textures - Grain size classification, grade scale and sediment classes. Grain size analysis-sieving and pipette analysis, graphic representation of size analysis data; statistical parameters and their geological significance. Sedimentary structures: classification, genesis and significance

Module 6:

- Sedimentary Facies and Depositional environments - Terrestrial, marine and transitional environments. Lithologies and structures formed in various environments. Brief description about Basin analysis. Plate Tectonics and sedimentation

Essential Reading:

1. Shrock R.R., Berk Twenhofel W.H. Principles of Invertebrate Palaeontology, McGraw Hill, 1953
2. Colebert H. Edwin, Evolution of the vertebrates, John Wiley and Sons, 1961
3. Biial u. Haq Anne Boersma, Introduction to Marine Micro-Palaeontology, Elsevier, 1998
4. Woods Henry, Invertebrate Palaeontology, Cambridge University Press, 1961
5. Tucker, Sedimentary Petrology: An introduction. John Willey & Sons, New York, 1981



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

6. Gary Nichols, Sedimentology and Stratigraphy, Wiley and Blackwell, 2009
S.M. Sengupta, Introduction to Sedimentology, CBS Publishers & Distributors Pvt. Ltd

Igneous And Metamorphic Petrology

GEL 3C 09 - Igneous And Metamorphic Petrology

Module 1:

- Bowen's reaction principle and reaction series. Major, minor, trace and rare earth element geochemistry of igneous rocks. Significance of isotopic studies in the petrogenesis of igneous rocks.
- Tectonomagmatic environment and igneous provinces. Compositional variation in magmas.
- Genetic significance of the textures and structures of the igneous rocks.
- Phase rule and its application in the study of silicate systems - phase diagrams, primary phase diagrams and liquidus projections.

Module 2:

- Equilibrium crystallization and melting paths in igneous systems.
- Phase diagrams- Unary, binary, ternary and quaternary diagrams. Study of the course of crystallization of the following chemical systems:
- Ternary systems:
- Forsterite- Diopside – Silica, Diopside - Anorthite –Forsterite,
- Diopside - Anorthite –Albite, Albite – Anorthite- Orthoclase MgO - Al₂O₃ - SiO₂.
- Quaternary system: Diopside- Anorthite- Albite- Forsterite.

Module 3:

- Classification of igneous rocks- Shand , Streckeisen and CIPW Mode and Norm .
- Variation diagrams. Differentiation index.
- Petrography and petrogenesis of Kimberlites and Carbonatites: Anorthosites, Basalts, Ultramafites and Ophiolites, Monomineralic rocks, Alkaline rocks, Pegmatites, Lamprophyres, Granites.

Module 4:

- Equilibrium aspects of metamorphic reactions: Driving force; Variance and Kinds; Exchange reactions.
- Phase diagrams and graphic representation of mineral assemblages; chemographic



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projections – ACF, AKF, AFM diagrams.

- Mineral assemblages, equilibrium reaction textures and geo-thermo barometry. Experimental and thermodynamic appraisal of metamorphic reactions.
- Metamorphic facies and facies series; Prograde and retrograde metamorphism; Role of fluids in metamorphic reactions.
- Metamorphism in space and time: Plate tectonics and metamorphic processes; Paired metamorphic belts, Archaean and Proterozoic terrains; Extraterrestrial Metamorphism (Impact and Shock Metamorphism); polymetamorphism

Module 5:

- Petrogenetic significance of metamorphic textures and structures.
- Progressive, contact and regional metamorphism of argillaceous, carbonate, basic igneous, and ultramafic rocks.
- Metamorphic differentiation, anatexis and origin of migmatites; regional metamorphism.
- Paired metamorphic belts in reference to plate tectonics.

Essential Reading:

1. Barker, A.J., 1990. *Introduction to Metamorphic Textures and Microstructures*. Blackie, 162p.
 2. Bucher, K. and Grapes, R., 2011. *Petrogenesis of Metamorphic Rocks*. Springer-Verlag, Berlin-Heidelberg, 428p.
 3. Frost, C.D., Frost, B.R., 2013. *Essentials of Igneous and Metamorphic Petrology*, Cambridge University Press, 336p.
 4. Gupta, A.K., 2007. *Petrology and Genesis of Igneous Rocks*. Narosa Publishing House, 496 p.
 5. Kretz, R., 1994. *Metamorphic Crystallization*. John Wiley & Sons, 507p.
 6. Miyashiro, A., 1978. *Metamorphism and Metamorphic Belts*. 3rd Edition. George Allen & Unwin, London, 492p.
 7. Spear, F.S., *Metamorphic Phase Equilibria and Pressure-Temperature-Time Paths*. Mineralogical Society of America, Monograph, 799p.
 8. Spry, A., 1974. *Metamorphic Textures*. Pergamon Press Ltd., 350 p.
 9. Vernon, R.H., 1983. *Metamorphic Processes: Reactions and Microstructure Development*. George Allen and Unwin, 247P.
 10. Vernon, R.H. and Clarke, G.L., 2008. *Principles of Metamorphic Petrology*. Cambridge University Press, 446p.
- Winter, J.D., 2011. *Principles of Igneous and Metamorphic Petrology*, Prentice-Hall, 728p



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Geochemistry And Isotope Geology

GEL 4C 10 - Geochemistry and Isotope Geology

Module 1:

- Overview of the origin of the elements.
- Nuclides and atoms. Electronic configuration of atoms arrangement of atoms in periodictable, electronegativity, ionization potential, chemical bonding.
- Chemistry of the universe, stars, nucleosynthesis, origin of the solar system, meteorites.
- Structure and composition of earth.
- Distribution of elements in core, mantle, hydrosphere and atmosphere

Module 2:

- Elementary crystal chemistry and thermodynamics
- Temperature and Equations of State; Laws of thermodynamics; Entropy; Enthalpy; Gibbs free energy;
- Trace elements and REE and their importance in fractional crystallization during magmatic/partial melting.
- **Geochemistry of weathering transportation and deposition.**

Module 3:

- Introduction to isotope geochemistry; applications in magmatic systems
- Major, minor and trace elements and their representation on variation and discriminant diagrams for presentation of geochemical data (bivariate, multivariate, element ratio variation, enrichment-depletion and vector diagrams)
- Geochemical cycle and principles of geochemical prospecting

Module 4:

- **Radioactivity, Decay of radioactive atoms and growth of radiogenic atoms**
- Geochronology and age of the Earth: Law of Radioactivity; Principles of isotopic dating, Decay schemes and Derivation of equation of age.
- Radiogenic isotope systems: K-Ar; Rb-Sr, Sm-Nd; Lu-Hf; Re-Os; U-Th–Pb methods of dating.

Module 5:

- Stable isotope systems; Notations; Mass independent fractionation; H, C, O, N and S isotopic systems
- Introduction to non-traditional stable isotope systems and their applications
- Modern Analytical techniques: Methods based on Flame photometer, Spectrophotometer,



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AAS, XRF, ICP-MS, TIMS, SIMS, SHRIMP.

- Fission track and other radiation damage methods of dating

Essential Reading:

1. Albarède, F., 2009. *Geochemistry: An Introduction*. Cambridge University Press, 356 p.
2. Faure, G., 1998. *Principles and Applications of Geochemistry*. Pearson, 624 p.
3. Faure, G., Mensing, T.M., *Isotopes: Principles and Applications*. Wiley, 928 p.
4. Hoefs, J., 2015. *Stable Isotope Geochemistry*. 7th Edition, Springer, 389 p.
5. White, W.M., 2015. *Isotope Geochemistry*. Wiley, 492 p.

Climatology

GEL 3E 01a - Climatology

Module 1:

- Latitudes & Longitudes | Standard Time, Motions of the earth: Rotation and Revolution, Atmosphere: Role, Structure & Composition Temperature Distribution on Earth Insolation & Heat Budget, Geographical distribution of the climatic types – Koppen’s and Thornthwaite’s classification of climate, **Global warming**.

Module 2:

- Lapse rate – Atmospheric stability, Latent Heat of Condensation, Atmospheric Pressure Belts and Wind Systems, Factors Affecting Wind movement, Coriolis Force, Types of Winds: Permanent, Secondary & Local Winds

Module 3:

- Temperature Inversion: Types & Effects on Weather, Geostrophic Wind, Jet Streams & Rossby Waves, Major Jet Streams: Subtropical Jet Stream & Polar Jet Stream

Module 4:

- **Air Mass - Air masses based on Source Regions, Fronts, Types of Fronts: Stationary Front, Warm Front, Cold Front & Occluded Front, Humidity: Relative Humidity & Dew point, Condensation, Forms of Condensation: Dew, Fog, Frost, Mist, Types of Clouds**

Module 5:

- **Smog: Photochemical smog & Sulfurous smog, Precipitation: Types of Precipitation, Types of Rainfall, Thunderstorm, Thunder & Lightning, Tornado, Tropical Cyclones: Favourable Conditions for Formation, Stages of Formation & Structure, Storm Surge, Naming of**



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Cyclones, Cyclones in Arabian Sea, Bay of Bengal, Temperate Cyclones (Mid Latitude Cyclone or Extra tropical cyclones or Frontal Cyclones)

Essential Reading:

1. Bernard Haurwitz and James, M. Austin, Climatology, Mc Graw Hill publications, New York & London.
2. D.S. Lal., Climatology
3. Austin Miller. A., Climatology
4. B.S. Negi., Climatology and oceanography.
5. Climatology: Thomas A Blair
6. Grant R Bigg: The Oceans and Climate

Quaternary Geology

GEL 3E 02b Quaternary Geology

Module 1:

Introduction to Quaternary period and types of Quaternary deposits. End of the Tertiary period and prologue to the Quaternary period, **tectonic movements**, magnetic polarity reversals, **global sea level**, and **littoral sedimentation**, Quaternary soil types, shallow water reserves and sediments used in human activities.

Module 2:

Relative chronologies and correlation, use of flora and fauna, non radioactive techniques, radioactive techniques. dating methods- radiocarbon, U/Th, Pb-Pb with case studies and dendrochronology

Module 3:

Causes of Quaternary climate change, manifestation of Quaternary climate change and current issues in climate change, Human and Quaternary climate change, fauna at the Pliocene Quaternary transition, emergence of hominids and evolution of Man.

Module 4:

The climate between 2.5 yr and 130,000 yr, ice ages, glaciations, last glaciations and the last glacial maximum, the deglaciation and the Holocene, Ocean and deep sea environments, terrestrial



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KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

environments, lake and desert environments, soils. Humid tropical environments, subtropical arid zones and warm deserts, fluctuation in the polar region and Mediterranean environments.

Module 5:

Recent crustal movements and young magmatism, post glacial crustal uplift, analysis of Quaternary sediments from borehole data, climate modeling and prediction of climate change.

Essential Reading:

1. Bradley, R.S. Quaternary paleoclimatology, methods of paleoclimate reconstruction,
2. Allen and Unwin, US 1985. 2. Riser, J.A.M., Quaternary Geology and the Environment, Springer, Praxis Publishing, Chichester, UK. 2001.

Marine Geology

GEL 3E 03a Marine Geology

Module 1:

- History of Marine geological studies-contribution of Challenger Expedition. Continental margin: features of continental shelf, continental slope and continental rise.
- Sea bottom topography-Submarine canyons, trenches, volcanoes, mid-oceanic ridges and abyssal plains.

Module 2:

- Physical properties of sea water: distribution of temperature, pressure and density. Thermocline, Pycnocline, Halocline.
- Chemical properties of sea water-elements and dissolved gases present in sea water. Salinity and distribution of salinity

Module 3:

- Marine sediments: Distribution and classification. CCD. Marine mineral resources – MnNodules, Phosphatic nodules, Gas hydrates.
-

Module 4:



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Coastal processes: waves, currents and tides. Coastal geomorphology, classification of coasts; Coastal erosion.
- Coastal protection structures -seawalls, jetties, groins. Coastal Regulatory zone (CRZ).
- Sea level Changes and Eustatic changes of sea level: evidences and implications

Module 5:

- Circulation: general circulation of the atmosphere boundaries - major surface currents of the world oceans, Coriolis effect, Ekman spiral, geostrophic currents, upwelling and sinking, diverging and converging surface water, Thermohaline circulation.
- Coupled ocean atmosphere system. EL Nino southern oscillation (ENSO), LaNina

Essential Reading:

1. John, L. Mero, Oceanic Mineral resources
2. Ph, H. Kuenen, Marine Geology, John Wiley and Sons.
3. Keith S.Stowe, Ocean Science. John Wiley and Sons
4. Kenneth, J.P., Marine Geology, Prentice Hall Inc., 1982
5. Shepard, F. P., Submarine Geology, Harper and Row Publishers, New York
6. Sverdrup, H. V., et al, The Ocean
7. Trask, P. D., Recent Marine sediments, Dover publications, 1939
8. Weisberg, J., and Parish, R, Introductory Oceanography. McGraw Hill, 1974
9. William, L. Donn, Meteorology
10. J. P. Riley R. Chester, Chemical Oceanography, Academic Press
11. L. Pickard W. J. Emery, Descriptive Physical Oceanography, Pergamon
1. Colin D Woodroffe, Coasts: Form, Process and Evolution, Cambridge.

Exploration Geology

GEL 4E 04a Exploration Geology

Module 1:

- Methods of surface and subsurface exploration. Prospecting for economic minerals.
- Drilling and its types. Different methods of sampling and assaying.
- Methods of ore reserve estimation.

Module 2:

- Geochemical exploration techniques. Mobility of elements, pathfinder elements, threshold values and geochemical anomalies.



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Mode of occurrence of trace elements. Primary dispersion pattern of deep-seated origin. Diffusion and leakage anomalies.
- Geochemical surveys, principles and methods of sampling. Anomalies in ground and surface waters and sediments.
- Biochemical anomalies. Geobotanical survey techniques. Geobotanical indicators.

Module 3:

- Geophysical exploration - Principles, scope, chief methods and their application.
- Electrical methods - principles, instruments used. Self-potential methods, resistivity methods. Application in ground water exploration.

Module 4:

- Gravity methods - Density and rock types, correlation of gravity data, regional and local anomalies. Sample interpretation, instrument used -gravimeter.
- Magnetic methods - field procedure, magnetometer, interpretation of magnetic data, correlations and applications. Principles of air borne survey.
- Seismic method- Seismic waves, travel velocity in various geological formations – Principles Field operations. Refraction and reflection survey - correction of seismic data - methods if interpretation -determination of attitude and depth of formation. Various types of shooting. Seismic instruments and records.

Module 5:

- Radiometric methods principles of radioactivity, methods, types of counters: G.M. counters and Scintillometers. Field methods and interpretations.
- Geophysical well logging Electrical, radiometric, sonic and thermal logging of boreholes.

Essential Reading:

1. Compton.R.R., Manual of Field Geology, John Wiley
2. Dobrin M.B, Introduction to Geophysical Prospecting, Pergamon Press
3. Elements of Prospecting and Exploration, Kalyan Publishers
4. Ginzburg, I., Principles of Geochemical prospecting, Pergamon Press
5. Griflithis, D. and Kind, R. F., Applied Geophysics for Geologists and Engineers, Pergamon Press
6. Kovalarkim, Biochemical exploration for mineral deposits Co-Xinian Press
7. Lahee, F. H., Field Geology, Mc Graw Hill
8. Low, G.W., Geological Field Methods, Harper and brothers
9. Malyyuga,D.F.,Biochemical methods of prospecting, Consultants Bureau,NewYork
10. Reedman, J. H., Techniques in Mineral Exploration, Allied Scientific Publishers
11. Sinha, R. K., and Sharma, N. L, Mineral Economics, Oxford and I.B.H. – Publishers



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

12. Swapan Haldar, Mineral Exploration, Principles and Applications, Elsevier.

1. S.M. Gandhi, B.C. Sarkar, Essentials of Mineral Exploration and Evaluation, Elsevier.

Engineering Geology

GEL 4E 05a Engineering Geology

Module 1:

- Geological studies and evaluation in planning, design, construction and problems of major civil structures.
- Elementary concepts of rock mechanics and soil mechanics. Site investigation techniques for civil engineering structures, Building stone and aggregate properties.
- Engineering properties of rocks, and soils.

Module 2:

- Dams: parts, types, forces acting on dams and reservoir problems. Geologic aspects of dam investigation.
- Tunnels: parts, classification, ground conditions, geological considerations. Geological and geotechnical aspects of Bridge, Highways, Foundations.

Module 3:

- Geological hazards and mitigation- landslides and earth quakes, Landslides: classification, analysis of slope stability, monitoring slope movements, hazard zonation mapping.
- Aseismic design of building, Geotechnical case studies of major projects in India.

Module 4:

- Mining geology: Planning, exploration, exploratory mining of surfaces and underground mineral deposits (methods and types).
- Mining methods - Alluvial mining-river sand mining, Mining of beach placers, Clay mining, Coal mining, Seabed mining, Exploration of petroleum

Module 5:

- Fundamentals of ore dressing: crushing, grinding, sizing, concentration by washing,



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scrubbing, jigging, tabling, floatation, magnetic and electrostatic separation, mineral legislation in India

Essential Reading:

1. Compton, R. R., Manual of Field Geology, John Wiley
2. Reedman, J. K., Techniques in Mineral Exploration, Allied Scientific Publishers
3. Arogyaswamy, R. N. F., Courses in Mining Geology, Oxford and IBH Pub. Co.
4. Fox, Engineering Geology
5. Peters, W. C., Exploration and Mining Geology, John Wiley
6. Bell, F.G. Fundamentals of Engineering Geology, Butterworths, 1983
7. Krynine and Judd, Principle of Engineering Geology and Geotectonic, McGraw Hill. 1957
8. Rose, A. W., Hawkes, H. F., and Webb, J. S., Geochemistry in Mineral Exploration, Academi
9. Press Gokhale, K.V.G.K. Principles of Engineering Geology B.S. Publications , 2006

Geomorphology, Structural Geology, Geoinformatics

GEL 1L 01 Geomorphology, Structural Geology, Geoinformatics

Geomorphology:

Interpretation of toposheets and identification of geomorphic features, fluvial and coastal landforms. Calculation of surface area and slope. Study of drainage pattern and morphometric analysis.

Structural Geology:

Interpretation of geologic maps. Trigonometric, graphic and stereographic solutions to problems in structural geology. Geometric analysis of planar and linear structures. Fabric diagrams, Rose diagrams and histograms

Geoinformatics

- Introduction to QGIS
- Georeferencing, Plotting of points, lines, polygons.
- Length and area calculation
- Map making – layout creation
- Gt.Aide: gridding of polygons, creation of sample locations, survey tracks etc. and planning for field studies.
- Basics of digital image processing using open source software
- Band combinations of satellite data
- Gathering satellite images from USGS and Bhuvan



CRITERION	I	Curricular Aspects
KEY INDICATOR	1.3	Curriculum Enrichment
METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

- Extraction of features
- Classification of features.

Crystallography, Mineralogy, Economic Geology, Hydrogeology, Palaeontology and Sedimentology

GEL 2L 02 – Crystallography, Mineralogy, Economic Geology, Hydrogeology, Palaeontology and Sedimentology

Crystallography:

Spherical projection of Cube, Octahedron and Dodecahedron.

Stereographic projection of holohedral classes of all the systems, pyritohedral, tetrahedral, plagiohedral classes of Isometric system and Rhombohedral classes of Hexagonal system.

Gnomonic projections of the normal class of Isometric, Tetragonal, Hexagonal and Orthorhombic systems.

Calculations of Axial ratios, Zone symbols, Napier's rule, Laws of anharmonic ratio.

Mineralogy:

Identification of mineral specimens based on physical properties.

Determination of the following optical characters by classical methods:

- o Order of interference colour
- o Sign of elongation
- o Birefringence
- o Scheme of pleochroism
- o Optic orientation
- o Determination of the vibration directions of polariser and analyzer
- o Extinction and extinction angle determination
- o Optic sign
- o Refractive index by Becke line method
- o Identification of thin sections of important rock forming minerals

Recalculation of mineral formula from EPMA analysis – Garnet; Pyroxene; Feldspar; biotite; hornblende

Economic Geology:

Identification of important ore minerals. Collection and display of data on production, consumption and export of important minerals. Identification of ore minerals under ore microscope. Genetic significance of important ore.

Hydrogeology:



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Preparation and interpretation of water table contour maps.

Problems on Porosity, permeability, void ratio and Darcy's Law. Computation of aquifer parameters from pump test data.

Graphical representation of hydro chemical data - Piper trilinear diagram, USSL Diagram, Stiffs polygon. Calculation of various parameters based on chemical data, electrical resistivity survey and interpretation of data.

Applied Palaeontology:

Separation of microfossils and preparation of slides of Ostracoda, Foraminifera and Bryozoa. Identification and study of microfossils in slides, at least 10 Nos.

Sedimentology:

Sieve analysis - plotting of sieve analysis data - histogram, Folk and Ward, Trask methods. Measurement and calculation of shape parameters, plotting and interpretation of these data. Separation of light and heavy minerals. Preparation of grain mounts. Study of grain mounts of Magnetite, Ilmenite, Monazite, Rutile, Garnet, Sillimanite, Zircon, Quartz, Leucoxene and Hornblende. Microscopic and megascopic study of sedimentary rocks.

Igneous And Metamorphic Petrology

GEL 3L 03 Igneous And Metamorphic Petrology

Igneous and Metamorphic Petrology:

Preparation of thin sections of igneous and metamorphic rock samples. (2 nos. each). Petrography of igneous and metamorphic rocks. Textures and structures of igneous and metamorphic rocks and their genetic significance with neat sketches.

Determination of modal composition, Calculation of norm (25 exercises). Niggli values. Variation diagrams Harker, Larsen, Niggli. Calculation of Differentiation index. Peacock alkali-lime index. Use of triangular diagram in the classification of igneous rocks. Use of triangular diagram in the classification of igneous rocks.

Identification of metamorphic mineral paragenesis in hand specimens and thin sections and arranging them according to the intensity of metamorphism. Graphical representation of metamorphic mineral parageneses. ACF and AKF diagrams. AFM diagrams.

Construction of phase diagrams based on experimental data of the following systems- Albite-anorthite, Forsterite-fayalite, Diopside- anorthite, Diopside - albite, Forsterite -silica.



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Geochemistry

GEL 4L 04 Geochemistry

Geochemistry:

Calculation of isotope proportions in samples. Determination of pH of groundwater samples. Determination of Na and K using flame photometer. Calculation of bulk rock compositions from modal mineralogy and mineral chemistry. Calculation of $\delta^{18}O$ in water reservoirs and ice-cores. Calculation of palaeo sea-surface temperatures Calculation of age of rock samples based on different decay schemes.

Developmental Biology And Endocrinology

Developmental Biology And Endocrinology

1. Induced ovulation in fish.
2. Identification of different developmental stages of frog - Egg, blastula, gastrula; - neurula, tadpole external gill and internal gill stage.
3. Vital staining of chick embryo.
4. Preparation of temporary/permanent whole mounts of chick embryo of the following stages to study the extent of development of the circulatory and nervous system in detail in 20, 24, 33, 49 & 72 hours of incubation.
5. Tracing the development of stained parts. candling, identification of blastoderm, window preparation - staining using stained agar strips and following the development.
6. Preparation of stained temporary/permanent mounts of larvae.
7. Experimental analysis of insect development - Drosophila.
8. Regeneration studies in frog tadpole tail. 9. Demonstration of sperm of rat/calotes/frog.
10. Morphological and histological studies of different types of placenta in mammals.
11. Hormones in Amphibian metamorphosis - Thyroxine/Iodine solution.
12. Inre of early chick embryo in vitro.
13. Study of invertebrate/vertebrate larval forms (minimum 7). 1 {- okraion of the mid-sagittal sections and cross sections of the chick embryo through head/ heart region of 24, 48 & 56 hours of incubation.

References:



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METRIC	1.3.1	Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability, Human Values into the Curriculum

1. Adamstone, E. B. and Waldo Shumway (1954). 3 Ed. A Laboratory Manual of Vertebrate Embryology. John Wiley & Sons, Inc.
2. Roberts Rugh (1961). Laboratory Manual of Vertebrate Embryology. Indian Ed., Allied Pacific hit. Ltd.
3. Browden, L. W., Erikson, C. A., and Jeffery, R. W. (1991). Developmental Biology' 3 Ed., Saunders College Publi., Philadelphia.
4. Zanol, M. X., Yochim, J. M., Mc Carthy, T. L. and Sanborn, R. C. (1964). Experimental Endocrinology: A source book of basic Techniques. Academic Press, New York.
5. Thomas, J. A. (1996). Endocrine methods. Academic press, New York.
6. Humason, G.L. (1962). Animal Tissue techniques. W. H. Freeman & Co.

BIOTECHNOLOGY

1. Isolation of genomic DNA
2. Separation of DNA by electrophoresis.
3. Bacterial transformation.
4. PCR
5. Cell immobilization.

MICROBIOLOGY

1. Selective isolation and enumeration of bacteria.
2. Bacterial staining technique
 - a. Simple staining of bacteria.
 - b. Negative staining
 - c. Hanging drop technique.
 - d. Gram staining.
 - e. Endospore staining.
3. Turbidity test for contamination of milk.
4. Preparation of media and sterilization. eg: Nutrient agar, MacConkey agar,
5. Cultivation of yeast and molds
6. Bacteriological analysis of water e.g., fecal pollutants.
7. Antibiotic sensitivity test.
8. Maintenance of E coli culture (shake and surface cultures) and quantitative evaluation (number of cells/ml) of a given sample of culture by dilution and plating.

MICROTECHNIQUE AND HISTOCHEMISTRY

1. Preparation of stained and unstained whole -mounts.



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2. Identification of the various tissues of animals in serial sections prepared using nuclear and cytoplasmic stains.

3. Processing a few types of tissues for the histochemical staining- Staining of serial sections to show the presence of

- a) Carbohydrates by PAS method
- b) Proteins by Mercuric bromophenol blue method
- c) Fats by Sudan Black B method
- d) DNA by Feulgen Technique. Submission: Stained/unstained

Whole mounts - 4 numbers

Double stained serial histology slides - 4 numbers

Histochemical slides - 2 numbers

Ecology And Ethology

Ecology And Ethology

1. Identification of marine plankton.
 2. Quantitative estimation of marine plankton.
 3. Estimation of BOD in polluted water sample.
 4. Estimation of salinity in water samples.
 5. Estimation of nitrate-nitrogen in water samples.
 6. Separation and identification of soil arthropods using Berlese funnel'
 7. Determination of moisture content of soil sample'
 8. Determination of water holding capacity of soil sample.
 9. Testing the transparency of water using Secchi disc
 10. Determination of primary productivity in pond water using light and dark bottle.
 11. Study of termite/ant colony
 12. Principle and application of the following instruments-GPS, Thermo hygrometer, Altimeter, Air samplers, Water samplers, Soil samplers, Berlese funnel, Lux meter' anemometer, Rain gauge, Plankton net, Plankton counting chamber, Weather balloon, Secchi disc etc. (at least six items)
- ii. Studying and reporting the behaviour and ecology of animals in selected fields (Social sparrow/white headed babbler or Bonnet Macaques)



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13. Foraging behaviour of ants.

14. Study of circadian rhythm

15. Behavioural reaction to moisture and light

FIELD STUDY

A study tour of at least five days duration (need not be at a stretch) to observe the ecology and behaviour of animals should be undertaken. The places of visit shall include inter tidal region, freshwater bodies, lakes, rivers, hills [streams, wetlands, mangroves, forests, grasslands, drinking water treatment, plants, and sewage treatment plants. A report of the field study is to be included in the practical record to be submitted at the time of examination.

References:

- 1- NC Aery' N.c. (2010)- A manual of environmental analysis. Ane books private limited.
- 2- Gmdenough, J; McGuire B. and Robert, W. (1993) perspectives on Animal Behaviour. John Wiley and Sons, Lond.
- 3 -} {aming, A. (1967) An Introduction to Animal Behaviour. Edward Arnold pub.,London. {-
- 4- {anning, A. and Dawkins,M.s.(1995).An introduction to Animal Behaviour, iambridge Press.
- 5- Bonnie,J,Plager and Ken Yamkawa (2003). Exploring Animal Behaviour in and Field. Academic press.
- 6- Michael, P. (1984). Ecological methods for field and laboratory investigations. Tata McGraw Hill publishing co.
- 7-Webbet' wJ (1972). Physicochemical Processes for water quality control. Wiley. interscience. t- cnrgp r Fra*lin, L. Burton and David, s.H.(2002). waste water Engineering Metcalf and Eddy.et ed. Inc. Tata McGraw Hill publishing co. Laboratory



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