STATISTICS FOR BASIC ECONOMIC DATA ANALYSIS

Programme	**B.Sc. Statistics**				
Course Code	**STA1MN110 (P)**				
Course Title	**Basic statistics and data visualization**				
Type of Course	**Minor**				
Semester	**I**				
Academic	**100-109**				
Level					
Course Details	**Credit**	**Lecture per week**	**Tutorial per week**	**Practical per week**	**Total Hours**
	4	**3**	**-**	**2**	**75**
Pre-requisites	Basic mathematical knowledge, skills in logical thinking and problem solving				
Course Summary	Through theoretical concepts and practical applications, students will develop the skills necessary to classify data, organize frequency distributions, and calculate and interpret measures of central tendency and dispersion.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Demonstrate different types of data, Construct frequency distribution. Apply different graphical representation effectively and critically evaluate the ethical implication of statistical methods aligning with human values	Ap	C	Instructor-created exams / Quiz
CO2	Demonstrate various measures of central tendency for discrete and continuous variables, including cumulative frequency distributions, to summarize and organize data effectively and critically evaluate ethical implications of statistical methods	Ap	F	Practical Assignment / Observation of Practical Skills/ Instructor-created exams

	aligning with human values.			
CO3	Calculate positional values such as quartiles, deciles, and percentiles, and interpret their significance in understanding the distribution of data. Apply measures of dispersion to assess the consistency or variability of data points within a data set and make comparisons between different data sets	Ap	C	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Apply statistical quality control methods to monitor and maintain quality in product and services	Ap	F	Instructor-created exams / Home Assignments
CO5	Apply spreadsheet functions to calculate measures of central tendency and dispersion.	Ap	P	Viva Voce/ Instructor-created exams
* - Remember (R), Understand (U), Apply (Ap), Analyse (An), Evaluate (E), Create (C) # - Factual Knowledge(F) Conceptual Knowledge (C) Procedural Knowledge (P) Metacognitive Knowledge (M)				

Detailed Syllabus:

Module	Unit	Content	Hrs (45+30)	Marks
I	**Introduction of data**		**9**	**15**
	1	Types of data- Primary data, Secondary data, Quantitative data, Qualitative data, Discrete data, Continuous data	2	
	2	Frequency distributions for discrete and continuous variables- Cumulative frequency distribution	2	
	3	Histogram, Frequency Polygon	3	
	4	Frequency Curve, Ogives	2	
	Sections from References: Unit 1: 2.2-2.5 [Ref 3] Unit 2: 3.3 [Ref 3] Unit 3&4: 4.3-4.4 [Ref 3]			

II	**Measures of central tendency**		**9**	**15**
	5	Mean	2	
	6	Median, Mode	3	
	7	GM	2	
	8	HM	2	
	Sections from References: Unit 5: 2.5 [Ref 1] Unit 6: 2.6&2.7 [Ref 1] Unit 7: 2.8[Ref 1] Unit 8: 2.9[Ref 1]			
III	**Measures of dispersion**		**19**	**25**
	9	Positional values- Quartiles	2	
	10	Deciles	2	
	11	Percentiles	1	
	12	Range	1	
	13	Quartile Deviation	3	
	14	Mean Deviation	3	
	15	Standard Deviation	3	
	16	Coefficient of Variation	1	
	17	Coefficient of Dispersion	3	
	Sections from References: Unit 9,10&11: 2.10,2.11[Ref 1] Unit 12,13,14&15: 2.12,2.13[Ref 1] Unit 16&17: 2.14[Ref 1]			
IV	**Statistical Quality Control**		**8**	**15**
	18	Concept of statistical quality control, assignable causes and chance causes, process control.	2	
	19	Construction of control charts, 3sigma limits	2	
	20	Control chart for variables: Mean chart and Range chart	2	
	21	Control chart for attributes: c chart	1	
	22	np chart	1	
	Sections from References: Unit 18: 25-1.1,1.2,2 [Ref 2] Unit 19: 25-3.1,3.2,3.3[Ref 2] Unit 20: 25:4.1,4.3[Ref 2] Unit 21: 25:5.4[Ref 2] Unit 22: 25:5.1[Ref 2]			
V	**PRACTICUM**		**30**	
	Do practice problems in spreadsheet from any 5 units of the given list and one additional problem decided by the teacher-in-charge, related to the content of the course. Other units listed here may be used as demonstrations of the concepts taught in the course.			
	1	Types of data		
	2	Frequency distributions for organizing		

		and summarizing data		
	3	Graphs of frequency distribution		
	4	Arithmetic mean		
	5	Median and Mode		
	6	Partition of values		
	7	Measure of dispersion		
	8	Different charts in quality control		
	Sections from References: Unit 1: 1.2 Ref [4] Unit 2: 2.1 Ref [4] Unit 3: 2.2 Ref [4] Unit 4: 3.1 Ref [4] Unit 5: 3.2 Ref [4] Unit 6: 3.3 Ref [4] Unit 7: 3.4 Ref [4] Unit 8:2.2 Ref[4]			

Books and References:

1. Gupta,S.C. and Kapoor,V.K.(2002). Fundamentals of Mathematical Statistics. , 11th edition,
Sulthan Chand, New Delhi.
2. Gupta, P.K. and Man Mohan. (1987). Operations Research and Statistical Analysis, Third
edition, Sultan Chand, New Delhi.
3. Gupta, S. C.(2015). Fundamentals of Statistics, Himalaya Publishing House.
4. Mario F Triola, Elementary Statistics using Excel, (2018), 6th edition.

Mapping of COs with PSOs and POs:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7
CO1	1	0	0	2	3	0	3
CO2	2	0	0	0	0	3	2
CO3	0	3	0	0	0	0	3
CO4	2	0	3	2	0	0	3
CO5	0	0	0	3	0	0	3

Correlation Levels:

Level	Correlation
-	Nil
1	Slightly / Low
2	Moderate/Medium
3	Substantial / High

Assessment Rubrics:

- Quiz / Assignment/ Quiz/ Discussion / Seminar
- Midterm Exam
- Programming Assignments (20%)
- Final Exam (70%)

Mapping of COs to Assessment Rubrics :

	Internal Exam	**Assignment**	**Project Evaluation**	**End Semester Examinations**
CO1	✓	✓		✓
CO2	✓	✓		✓
CO3	✓	✓		✓
CO4	✓	✓		✓
CO5	✓			