Course Code	STA1MN103 (P)				
Course Title	Introductory statistics with R				
Type of Course	Minor				
Semester	I				
Academic Level	100 - 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	4	3	-	2	75
Course Summary	This course covers data types, distributions, graphs, and statistical measures using R programming. Students learn to analyze data effectively for informed decision-making across diverse domains.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Identify data types and construct frequency distributions.	U	C	Instructor-created exams / Quiz
CO2	Create diverse graphical representations effectively and critically evaluate ethical implications of statistical methods aligning with human values.	Ap	F	Practical Assignment / Observation of Practical Skills/ Instructor-created exams
CO3	Calculate and apply central tendency measures practically and analyze data to help entrepreneurial decisions using critical thinking skills..	Ap	C	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Use measures of central tendency to summarize and describe data, demonstrating the ability to communicate the findings in both written and graphical formats	U	C	Instructor-created exams / Home Assignments
CO5	Master R programming basics and descriptive statistics.	Ap	C	One Minute Reflection Writing assignments/ Instructor-created exams
CO6	Implement R for practical data analysis and graphical representation.	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 (70)
I		**Data**	**12**	**15**
	1	Types of data: Primary data, Secondary data, Quantitative data, Qualitative data, discrete data, continuous data	4	
	2	Frequency distribution: Ungrouped and grouped	4	
	3	Cumulative frequency distribution	4	
	Unit 1:2.2,11.1,2.1 Ref[1] Unit 2: 2.2 Ref[1] Unit 3: 3.5 Ref[3]			
II		**Graphical representation of data**	**9**	**15**
	4	Line diagram, Bar diagram	3	
	5	Pictogram, Pie diagram, Histogram	3	
	6	Frequency Polygon, Frequency curve, Ogives.	3	
	Unit 4: 4.3.3 Ref[3] Unit 5:4.3.4, 4.3.6 Ref[3] Unit 6: 4.4.3 Ref[3]			
III		**Measures of central tendency**	**10**	**25**
	7	Arithmetic Mean	2	
	8	Median	2	
	9	Mode	2	
	10	Geometric mean	2	
	11	Harmonic mean	2	
	Unit 7: 5.4 Ref[3] Unit 8: 5.6.1 Ref[3] Unit 9: 5.7.1 Ref[3] Unit 10: 5.9 Ref[3] Unit 11: 5.10 Ref[3]			
IV		**Introduction to R programming**	**14**	**15**
	12	Installing R	1	
	13	Objects in R	1	
	14	Using functions in R	1	
	15	Importing data	1	
	16	Exporting data	1	
	17	Simple base R plots	2	
	18	Multiple graphs	2	

	19	R packages	1	
	20	Exporting plots	2	
	21	Getting help	1	
	22	Saving stuff in R	1	
	Unit 12: 1.1 Ref[2] Unit 13: 2.2 Ref[2] Unit 14: 2.3 Ref[2] Unit 15: 3.3 Ref[2] Unit 16: 3.6 Ref[2] Unit 17: 4.2 Ref[2] Unit 18: 4.4 Ref[2] Unit 19: 1.5 Ref[2] Unit 20: 4.5 Ref [2] Unit 21: 2.5 Ref[2] Unit 22: 2.6 Ref[2]			
V	**PRACTICUM**		**30**	
	Do practice problems in R software 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	Functions in R— data.frame		
	2	multiply_columns()		
	3	return()		
	4	identical()		
	5	Conditional statements-if and else		
	6	Combining logical operators		
	7	For loop		
	8	While loop		
	Sections from References: Unit 1: 7.2 Ref[2] Unit 2: 7.2Ref[2] Unit 3: 7.2Ref[2] Unit 4: 7.2Ref[2] Unit 5: 7.3Ref[2] Unit 6: 7.4 Ref[2] Unit 7: 7.5.1 Ref[2] Unit 8: 7.5.2 Ref[2]			

Books and References:

1. Gupta, S.C. and Kapoor, V.K. (1997) Fundamentals of Mathematical Statistics. Sultan Chand and Sons, New Delhi

2. Douglas, Alex, Deon Roos, Francesca Mancini, Ana Couto, and David Lusseau. (2020), *An Introduction to R*. https://intro2r.com/index.html.

3. S.C. Gupta, Fundamentals of Statistics, Himalaya Publishing house,

Mapping of COs with PSOs and POs :

	PSO 1	PSO 2	PSO 3	PSO4	PSO 5	PSO6	PO1	PO2	PO3	PO4	PO5	PO6
CO 1	3	3	-	-	-	2	2	2	-	-	-	-
CO 2	-	2	-	3	2	3	-	3	1	-	3	-
CO 3	-	2	-	2	-	2	1	2	2	-	-	3
CO 4	-	-	-	-	-	1	3	1	-	-	-	-
CO 5	-	-	3	-	-	-	2	-	2	3	-	-
CO 6	2	-	-	-	-	2	1	-	1	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
CO 1	✓	✓		✓
CO 2	✓	✓		✓
CO 3	✓			✓
CO 4		✓		✓
CO 5	✓	✓		✓
CO 6	✓			