Programme	BSc Statistics				
Course Code	STA2FM104				
Course Title	Statistical sampling and probability theory				
Type of Course	MDC				
Semester	II				
Academic Level	100 - 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	3	3	-	-	45
Pre-requisites					
Course Summary	Students will learn a comprehensive understanding of fundamental concepts in statistics, including data, variables, attributes, and methods of data collection and explore various types of sampling methods and understand the basics of probability theory.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Define and differentiate between data, variables, and attributes, and understand their role in statistical analysis.	U	C	Instructor-created exams / Quiz
CO2	Demonstrate proficiency in preparing questionnaires for data collection, considering factors such as clarity, relevance, and reliability and critically evaluate ethical implications of statistical methods aligning with human values..	U	F	Seminar Presentation / Instructor-created exams
CO3	Identify and describe different types of sampling methods, including simple random sampling, stratified random sampling, systematic sampling, and cluster sampling and analyze data to help entrepreneurial decisions using critical thinking skills.	R	C	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Define random experiment, sample space, and event, and understand their relevance in probability theory.	U	C	Instructor-created exams / Home Assignments
CO5	Define probability and understand its interpretation as a measure of uncertainty.	U	F	One Minute Reflection Writing assignments/ I

				nstructor-created exams
CO6	Represent how to list different types of data using any software	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)				

COURSE CONTENT

Module		Content	Hours (36+9)	Marks (50)
	Basic Statistics		**10**	**10**
1	**1**	Data	2	
	2	Variables and Attributes	2	
	3	Definition of Population and Sample	3	
	4	Preparation of questionnaire for data collection	3	
	Sections from References: Unit 1: 2.1 [Ref 2] Unit 2: 1.5[Ref 2] Unit 3: 1.3 [Ref 2] Unit 4: 1 [Ref 2]			
	Census and Sampling		**6**	**10**
2	**5**	Census and Sampling	2	
	6	Principal steps in a sample survey	2	
	7	Types of sampling	1	
	8	Sampling methods	1	
	Sections from References: Unit 5: 15.2,15.3,15.6 [Ref 3] Unit 6: 15.8 [Ref 3] Unit 7:15.10[Ref 3] Unit 8:15.10[Ref 3]			
	Random Sampling Methods		**9**	**15**
3	**9**	simple random sampling with and without replacement	5	
	10	Stratified random sampling (concept only)	2	
	11	Systematic Sampling (concept only)	1	

	12	Cluster sampling (concept only)	1	
	Sections from References: Unit 9:15.11,15.11.1 [Ref 3] Unit 10: 15.12,15.12.1 [Ref 3] Unit 11: 15.13 [Ref 3] Unit 12:A2 [Ref 2]			
	Introduction to Probability		**11**	**15**
4	**13**	Random experiment	1	
	14	Sample space	1	
	15	event	2	
	16	Statistical regularity	3	
	17	Definition of Probability	2	
	18	Concept of conditional probability of two events	2	
	Sections from References: Unit 13: 4.5.1 Ref [1] Unit 14: 4.5.1 Ref [1] Unit 15: 4.5.2 Ref [1] Unit 16: 4.5 Ref [1] Unit 17: 4.6 Ref [1] Unit 18: 4.6 Ref [1]			
5	**Open ended - Practical problems using softwares**		**9**	
	1	Data collection	**3**	
	2	Sample selection	**3**	
	3	Probability	**3**	
	Books and References: 6. Gupta, S. C. and Kapoor, V. K. (2002). Fundamentals of Mathematical Statistics. **,** 11th edition, Sulthan Chand, New Delhi. 7. Prem. S. Mann (2010). Introductory Statistics, 7th edition, Wiley **8.** Gupta, S. C. (2015). Fundamentals of Statistics, Himalaya Publishing House			

Correlation Levels:

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

Assessment Rubrics:

10. Quiz / Assignment/ Quiz/ Discussion / Seminar
11. Midterm Exam
12. Programming Assignments (20%)
13. 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	✓			