

Programme	BSc Statistics				
Course Code	STA1FM102				
Course Title	Fundamentals of Statistics				
Type of Course	MDC				
Semester	I				
Academic Level	100 - 199				
Course Details	Credit	Lecture per week	Tutorial per week	Practical per week	Total Hours
	3	3	-	-	45
Pre-requisites	Basic mathematical knowledge				
Course Summary	Students will learn about different types of data, scales of measurement, and techniques for representing and summarizing data using measures of central tendency and dispersion, as well as exploring concepts of skewness and kurtosis.				

Course Outcomes (CO):

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Define statistics and its scope in various fields of study, including its role in decision-making.	U	C	Instructor-created exams / Quiz
CO2	Construct tables and diagrams to organize and summarize data efficiently for analysis and analyze data to help entrepreneurial decisions using critical thinking skills.	Ap	C	Instructor-created exams / Seminar Presentation
CO3	Create various types of diagrams such as bar graphs, pie charts, and histograms for visual representation of data and critically evaluate ethical implications of statistical methods aligning with human values.	Ap	F	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Compute measures of central tendency including mean, median, and mode to identify typical or central values within a data set.	Ap	C	Instructor-created exams / Home Assignments
CO5	Interpret partition values such as quartiles and percentiles to identify specific data points within a distribution.	U	F	One Minute Reflection Writing assignments/ Instructor-created

				ed exams
CO6	Illustrate measures of central tendency and dispersion using spread sheet.	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)
1	Introduction to Statistics	8	10
	1 Definition of Statistics	1	
	2 Scope of Statistics	2	
	3 Concepts of statistical population and sample	2	
	4 Collection of data	3	
	Sections from References: Unit 1: 1.1&1.2 [Ref 1] Unit 2: 1.3 [Ref 1] Unit 3: 1.3 [Ref 2] Unit 4: 1.4 [Ref 2]		
2	Organizing and Graphing Data	12	15
	5 Types of data	3	
	6 Scale of measurements	2	
	7 Classification of data	2	
	8 Tabulation of data	2	
	9 Diagrammatic representation of data	3	
	Sections from References: Unit 5: 2.1 [Ref 2] Unit 6: 2.1 [Ref 1] Unit 7: 2.1[Ref 1] Unit 8: 2.3[Ref 2] Unit 9: 2.2 [Ref 1 and 2]		
3	Measures of Central Tendency & Dispersion	11	15
	10 Arithmetic Mean	2	
	11 Geometric Mean	1	
	12 Harmonic Mean	1	
	13 Median & Mode	2	

	14	Measures of Dispersion - Definition	1	
	15	Absolute Measures of Dispersion	4	
	Sections from References: Unit 10: 2.3, 2.4 & 2.5 [Ref 1] Unit 11: 2.8 [Ref 1] Unit 12: 2.9[Ref 1] Unit 13: 2.6 & 2.7[Ref 1] Unit 14: 3.1 [Ref 1] Unit 15: 3.4,3.5,3.6, & 3.7 [Ref 1]			
	Skewness & Kurtosis		5	10
4	16	Partition values	3	
	17	Skewness	1	
	18	Kurtosis	1	
	Sections from References: Unit 16: 2.11 [Ref 1] Unit 17: 3.13 [Ref 1] Unit 18: 3.14[Ref 1]			
5	Open ended: practical problems Using Spreadsheet		9	
	1	Frequency distributions for organizing and summarizing data	3	
	2	Measures of Central Tendency	3	
	3	Measures of Dispersion	3	
	Sections from References: Unit 1: 2.1Ref [3] Unit 2: 2.2 Ref [3] Unit 3: 3.2 Ref [3]			
	Books and References: ▪ Gupta, S. C. and Kapoor, V. K. (2002). Fundamentals of Mathematical Statistics. , 11th edition, Sulthan Chand, New Delhi. ▪ Prem. S. Mann (2010). Introductory Statistics, 7th edition, Wiley ▪ Mario F Triola, Elementary Statistics using Excel, (2018), 6th edition.			

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	-	-	1	-	2	-	2	1	-	-	-	-
CO 2	2	2	-	-	-	2	2	2	-	-	-	3
CO 3	-	-	3	-	-	-	1	-	-	-	3	-
CO 4	2	2	3	-	3	2	2	-	2	3	-	-
CO 5	-	2	-	2	2	3	2	3	2	-	-	-
CO 6	3	2	-	-	-	3	3	-	-	3	-	-

Correlation Levels:

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

Assessment Rubrics:

6. Quiz / Assignment/ Quiz/ Discussion / Seminar
7. Midterm Exam
8. Programming Assignments (20%)
9. 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	✓			

Programme	B. Sc. Statistics
Course Code	STA2FM103

	Internal Exam	Assignm ent	Project Evaluation	End Semester Examinations		
CO 1	✓	✓		✓		
CO 2	✓			✓		
CO 3	✓			✓		
CO 4		✓		✓		
CO 5		✓		✓		
CO 6	✓					
Programme		BSc Statistics				
Course Code		STA2FM106(2)				
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	U	F	Seminar Presentation / Instructor-created exams

	human values..			
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/ Instructor-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. , 11 th 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			

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

Correlation Levels:

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-	Nil
1	Slightly / Low
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Assessment Rubrics:

10. Quiz / Assignment/ Quiz/ Discussion / Seminar
11. Midterm Exam