

Programme	BSc Statistics
Course Code	STA1MN104 (P)
Course Title	APPLIED STATISTICS
Type of Course	Minor
Semester	I

CO	CO Statement	Cognitive Level*	Knowledge Category#	Evaluation Tools used
CO1	Understand grouped and ungrouped data, scales of measurement, and questionnaire design and critically evaluate ethical implications of statistical methods aligning with human values.	U	C	Instructor-created exams / Quiz
CO2	Comprehend statistical surveys, both census and sample, along with probability and nonprobability sampling methods.	U	C	Practical Assignment / Observation of Practical Skills/ Instructor-created exams
CO3	Understand index numbers, emphasizing weighted aggregate index numbers and analyze data to help entrepreneurial decisions using critical thinking skills..	U	F	Seminar Presentation / Group Tutorial Work/ Instructor-created exams
CO4	Identify and describe key measures in vital statistics	U	C	Instructor-created exams / Home Assignments
CO5	Gain proficiency in time series analysis, including the measurement of secular trends and seasonal indices.	U	F	One Minute Reflection Writing assignments/ Instructor-created exams
CO6	Implement theoretical knowledge to practical scenarios through hands-on exercises 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				

**Detailed Syllabus:**

Module	Unit	Content	Hrs (48+ 30)	Marks (70)
<b>I</b>	<b>Data and questionnaire</b>		<b>9</b>	<b>15</b>
	1	Statistical Survey—An Introduction	1	
	2	Planning the Survey	1	
	3	Specification of the Purpose	1	
	4	Scope of the Survey	1	
	5	Sources of Data	2	
	6	Methods of collecting primary data	2	
	7	Drafting the questionnaire	1	
	Unit 1: 2.2 Ref[1] Unit 2: 2.3 Ref[1]  Unit 3: 2.3 Ref[1]  Unit 4: 2.3 Ref[1]  Unit 5: 2.5 Ref[1]  Unit 6: 3.3 Ref[1] Unit 7: 3.8 Ref[1]			
<b>II</b>	<b>Sample Survey</b>		<b>10</b>	<b>15</b>
	4	Introduction	1	
	5	Types of sampling	2	
	6	Purposive sampling	2	
	7	Random sampling	1	
	8	Simple sampling	2	
	9	Stratified sampling	2	
		Unit 1: 12.1 Ref[2]		

	Unit 2:12.2 Ref[2] Unit 3: 1 2.2.1 Ref[2] Unit 4: 12.2.2 Ref[2] Unit 5: 12.2.3 Ref[2] Unit 6: 12.2.4 Ref [2]		
<b>III</b>	<b>Index numbers and Vital Statistics</b>	<b>16</b>	<b>20</b>
	7 Introduction and Uses of Index Numbers	1	
	8 Types of Index Numbers	1	
	9 Problems in the construction of Index Number	1	
	10 Methods of Construction of Index Numbers- Simple and Weighted Index Number	1	
	11 Tests for an Ideal Index Number- Time Reversal Test and Factor Reversal Test	2	
	12 Introduction to Vital Statistics	1	
	13 Uses of Vital Statistics	1	
	14 Collection of Vital Statistics-Registration Method, Census Enumeration Method, Survey Method, Analytical Method	2	
	15 Measures of Fertility –Crude Birth Rate (CBR), General Fertility Rate (GFR), Specific Fertility Rate (ASFR). Total Fertility Rate (TFR) (Concept and Problems)	3	
	16 Measurement of Mortality- Crude Death Rate (CDR), Specific Death Rate (ASDR), Standardized Death Rate (SDR), Infant Mortality Rate, Maternal Mortality Rate(Concept and Problems)	3	
	Unit 7: 10.1&10.2[Ref 3] Unit 8: 10.3 [Ref 3] Unit 9: 10.4[Ref 3] Unit 10: 10.5 [Ref 3] Unit 11:10.6.2&10.6.3 [Ref 3] Unit 12: 16.2 [Ref 1] Unit 13:16.2&16.3 [Ref 1] Unit 14: 16.3&16.4[Ref 1] Unit 15: 16.5&16.6 [Ref 1] Unit 16:16.14,16.15,16.16,16.18 [Ref 1]		
<b>IV</b>	<b>Time series</b>	<b>10</b>	<b>20</b>
	17 Introduction to Time Series & Utility of Time Series	1	
	18 Components of Time Series	1	

	19	Measurement of Trend- Graphic Method	2	
	20	Semi Average Method	2	
	21	Method of Moving Average(Concept and Problems)	2	
	22	Measurement of Seasonal Variations-Method of Simple Averages	2	
	Sections from References: Unit 17: 11.1& 11.3[Ref 3] Unit 18:11.2[Ref 3] Unit 19:11.5[Ref 3] Unit 20: 11.5[Ref 3] .Unit 21: 11.5[Ref 3] Unit 22:11.6 [Ref 3]			
<b>V</b>	<b>PRACTICUM</b>		<b>30</b>	
	Do practice problems using any 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	Problems on graphic method		
	2	Problems on Semi average method		
	3	Problems on Moving average		
	4	Problems on method of Simple averages		
	5	Determination of sample size in sampling		
	6	Sampling errors		
	7	Method of reducing sampling errors		
	8	Non sampling errors		
	Sections from References: Unit 1: 11.5 Ref[3] Unit 2: 11.5 Ref[3] Unit 3:11.6 Ref[3] Unit 4: 11.6 Ref[3] Unit 5: 4.16 Ref[1] Unit 6:4.19 Ref[1] Unit 7: 4.20 Ref[1] Unit 8: 4.21 Ref[1]			
Books and References: 1. S.P Gupta (2021),Statistical Methods 46 th Edition 2. Gupta, S.C. and Kapoor, V.K. (1997) Fundamentals of Mathematical Statistics. Sultan Chand and Sons, New Delhi 3. Gupta, S. C.. (2015). Fundamentals of Statistics, Himalaya Publishing House				

### Mapping of COs with PSOs and POs :

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

**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	✓			