



Syllabus

For B.A 3rd Semester Courses in Statistics
(June 2018 onwards)

Contents:

Theory Syllabus for Courses:

ASTA0301– Descriptive Statistics (B).

ASTA0302– Operations Research.

Practical Course Syllabus for: ASTA03PR
Evaluation and Assessment guidelines.

S.Y.B.A. STATISTICS

COURSE CODE: ASTA0301

DESCRIPTIVE STATISTICS (B)

Course Objectives:

1) To orient students on techniques of data analysis.

Number of lectures: 45

Course Outcomes:

On completion of the course the learner should be able to:

- 1 Students are able to measure simple correlation, regression and diagnostic regression in bivariate data sets.
2. Students are introduced to specialized averages under the domain of Index numbers
3. Students are aware of the concept of a Time Series and are familiar with simple measures of trend and seasonal variation.

Unit-1: Analysis of Bivariate Data.

(15 L)

Scatter diagram. Product Moment correlation coefficient and its properties. Rank correlation-Spearman's measure. Concept of linear regression. Principle of least squares. Fitting of straight line by method of least squares. Relation between regression coefficients and correlation coefficient. Coefficient of determination. Fitting of curves reducible to linear form by transformation. Fitting of quadratic curve using least squares.

Unit-2 : Index Numbers.

(15 L)

Index number as a comparative tool. Stages in the construction of Index Numbers.

Simple and Composite Index Numbers.

Fixed base Index Numbers. Chain Base Index Numbers, Base shifting, Splicing and Deflating. Price and Quantity Index Numbers - Laspeyres', Paasche's, Marshal-Edgeworth's, Dorbisch-Bowley's and Fisher's Index Numbers. Value Index Number. Time reversal test. Factor reversal test, Circular test. Cost of Living Index Number. Concept of Real Income based on the Consumer Price Index Number.

Problems in the construction of Consumer Price Index Number.

Unit-3 : TIME SERIES

(15 L)

Definition of Time series. Its components. Models of Time Series.

Estimation of trend by i) Freehand curve method. ii) Method of semi averages. iii) Method of moving averages iv) Method of least squares v) Exponential smoothing method

Estimation of seasonal component by i) Method of simple averages

ii) Ratio to moving average method iii) Ratio to trend method.

List of Recommended Reference Books

1. Goon A.M., Gupta M.K., Dasgupta B. Fundamentals of Statistics, Volume I, The World Press Private Limited, Calcutta. Fifth edition.
2. Kothari, C.R.: Research Methodology, Methods and Techniques, Wiley Eastern Limited. First Edition.
3. Shah R.J.: Descriptive Statistics, Seth Publications. Eighth edition.
4. Spiegel, M.R.: Theory and Problems of Statistics, Schaum's Publishing Series. Tata McGraw-Hill. First edition.
5. Welling, Khandeparkar, Pawar, Naralkar: Descriptive Statistics: Manan Prakashan
6. S.P. Gupta: Statistical Methods, Sultan Chand & Sons. First edition.
7. Richard. I. Levin, David.S. Rubin: Statistics for Management. Fifth edition
8. Prem . S. Mann (2007). Introductory Statistics (6th edition) John Wiley & Sons.
9. Allan Bluman (2009) Introductory Statistics. A step-by-step approach (7th edition). McGraw-Hill
10. S.C.Gupta ,V.K.Kapoor: Fundamentals of Applied Statistics, Third edition, Sultan Chand & Sons.

Topics for Practicals

- 1 Correlation Analysis
- 2 Regression Analysis.
- 3 Curve fitting by the Method of Least Squares.
- 4 Index Numbers.
- 5 Time-Series

Evaluation (Theory):

Total marks per course - 100.

CIA- 40 marks

CIA 1: Written test -20 marks

CIA 2: Written test -20 marks

End Semester Examination – 60 marks

One question from each unit for 20 marks, with internal choice.

Total marks per question with choice – 25 to 30

Evaluation of ASTA03PR (0301)

Total marks - 50.

Group Project – 15 marks

Journal – 5 marks.

End Semester Practical Examination – 30 marks.

Grid Template - End Semester Examination (Theory)

Q. No	Knowledge (Definitions, Descriptive Notes, Theoretical Proofs)	Understanding & Application (Illustration/Numerical Problems)	Marks
1.	15	05	20
2.	15	05	20
3.	15	05	20
Total	45	15	60
Weightage (%)	75%	25%	100%

S.Y. B.A. _ Statistics

Course: ASTA0302

Title: Operations Research

Course Objectives:

To provide students with an insight into

1. The structures and processes that Operations Research can offer and the practical utility of its techniques.
2. Techniques of Operations Research used for scheduling and controlling projects.

Number of lectures: 45

Course Outcomes:

1. Students have an understanding of the topic of Operations Research.
2. Students understand the concept of formulating real life situations into mathematical models
3. Students are able to use techniques under Linear Programming problems (Graphical & Simplex).
4. Students are cognizant of the use of techniques to solve Transportation and Assignment problems.
5. Students are familiar with simple Project Management techniques (PERT & CPM)

Unit 1

(15L)

Linear Programming Problem (L.P.P.):

Definition, Mathematical Formulation. Concepts of Solution, Feasible Solution, Basic Feasible Solution, Optimal solution, Slack, Surplus & Artificial variable, Standard form, Canonical form

Graphical Method & Simplex Algorithm to obtain the solution to an L.P.P. Problems involving Unique Solution, Multiple Solution, Unbounded Solution and Infeasible Solution

Unit 2

(15 L)

Transportation Model

Definition, Mathematical Formulation Concepts of Feasible solution, Basic feasible solution Optimal and multiple solution.

Initial Basic Feasible Solution using

- (i) Vogel's Approximation Method.
- (ii) MODI Method for optimality.

Problems involving unique solution, multiple solutions, degeneracy, maximization, prohibited route(s) and production costs.

Unbalanced Transportation problems.

Assignment model

Definition, Mathematical formulation. Solution by Hungarian Method.

Unbalanced Assignment problems.

Problems involving Maximization & prohibited assignments.

Unit 3.

(15 L)

Network Analysis

Concept of project as an organized effort with time management.

Objective and Outline of the techniques.

Diagrammatic representation of activities in a project

Gantt Chart and Network Diagram.

Slack time and Float times. Determination of Critical path.

Probability consideration in project scheduling.

Project cost analysis, Resource leveling, Resource allocation

List Of Recommended Reference Books

1. PERT and CPM, Principles and Applications: Srinath., 2nd edition, East West Press Pvt Ltd
2. Operations Research: Kantiswaroop, P.K. Gupta and Manmohan Gupta.4th edition, Sultan Chand and Sons
3. Operations Research: S.D. Sharma, 11th edition Kedarnath, Ramnath & Co
4. Operations Research: H.A.Taha, 6th edition, Prentice Hall of India

List of Practicals:

1. Linear Programming Problem
2. Transportation Problem
3. Assignment Problem.
4. Network Analysis
5. Introduce a practical for solving LPP using EXCEL

Evaluation (Theory):

Total marks per course - 100.

CIA- 40 marks

CIA 1: Written test -20 marks

CIA 2: Written test -20 marks

End Semester Examination – 60 marks

One question from each unit for 20 marks, with internal choice.

Total marks per question with choice – 25 to 30

Evaluation of ASTA03PR (0302)

Total marks - 50.

Group Project – 15 marks

Journal – 5 marks.

End Semester Practical Examination – 30 marks

Grid Template - End Semester Examination (Theory)

Q. No	Knowledge (Definitions, Descriptive Notes, Theoretical Proofs)	Understanding & Application (Illustration/Numerical Problems)	Marks
1.	15	05	20
2.	15	05	20
3.	15	05	20
Total	45	15	60
Weightage (%)	75%	25%	100%