Syllabus

For B.A 2nd Semester Course in Statistics
(June 2020 onwards)

Contents:

F.Y.B.A Statistics **Course : ASTA0201**

Title: Statistical Methods (A).

Course Objectives:

To study:

1. **Concept of probability**
2. **Probability distributions**

Number. of lectures: 45

Course Outcomes:

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

1. Relate to the concept of probability and random variables.
2. Identify basic discrete distributions and be cognizant of their properties.
3. Have knowledge of the properties and uses of various discrete distributions (Uniform, Bernoulli, Binomial, Poisson, Hypergeometric)

Unit 1 **(15L)**

Elementary probability theory.

Random Experiment, Sample Point & Sample Space.
Discrete Sample Space, Definition of Event, Elementary Event, Algebra of Events.
Mutually exclusive events, Exhaustive events. Subjective Probability.
Classical, Empirical and Axiomatic definitions of probability.
Conditional Probability, Independence of n Events.(n = 2, 3).
Theorems on Addition & Multiplication of Probabilities,
Bayes' Theorem (All theorems with proofs).

Unit 2 **(15L)**

Discrete Random variable:

Univariate :

Random variable. Definition, Properties of Probability Mass Function & Cumulative Distribution Function. Expectation and variance of a random variable. Theorems on Expectation and Variance.
Raw & Central Moments and the relationship between them (without proof). Concept of Skewness and Kurtosis..

Bivariate:

Joint Probability Mass Function of two Discrete Random Variables, Marginal and Conditional Probability Distributions, Independence of Two Random Variables.
Theorems on Expectation, Variance.
Covariance, Correlation coefficient between two random variables

Unit 3 **(15L)**

Standard Discrete Probability Distributions:

Discrete Uniform distribution, Bernoulli distribution, Binomial Distribution, Poisson Distribution, Hypergeometric Distribution. Derivation of mean, & variance, Calculation of Expected frequencies.

Binomial approximation to Poisson and Hypergeometric approximation to Binomial Distribution (statement only)

Degenerate distribution.

List Of Recommended Reference Books

1. Statistical Methods : Welling, Khandeparkar, Pawar, Naralkar Manan Publications. First edition.
2. Statistical Methods : R.J. Shah – Seth Publications. Tenth edition.
3. Basic Statistics : B.L. Agarwal – New Age International Ltd. Fifth edition
4. Theory and Problems of Statistics : Spiegel M.R. – Schaums Publishing Series, Tata Mcgraw - Hill. First edition
5. Probability and Statistical Inference : Hogg R.V, Tanis E.P. – Macmillan Publishing Co. Inc.
6. Fundamentals of Mathematical Statistics : S. C. Gupta, V.K.Kapoor – Sultan Chand & Sons. Eleventh edition.
7. Statistical Methods : S.P. Gupta – Sultan Chand & Sons. Thirty third edition.
8. Fundamentals of Statistics , Volume II, - Goon A.M., Gupta M.K., Dasgupta B. – The World Press Pvt. Ltd, Calcutta. Fifth edition.
9. Richard. I. Levin, David .S. Rubin: Statistics for Management Fifth edition
10. Prem . S. Mann (2007) . Introductory Statistics (6^{th} edition) John Wiley & Sons.
11. Allan Bluman (2009) Introductory Statistics. A step by step approach (7^{th} edition). McGraw-Hill.

Topics for Practicals

1. Probability
2. Discrete Random Variable
3. Bivariate Probability Distributions
4. Binomial, Poisson and Hypergeometric Distributions
   Calculation of Expected frequency from a conducted experiment.

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 ASTA02PR
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 (Definition, 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%