



COURSE CONTENT

COMPUTER ORIENTED STATISTICAL METHODS								
IV Semester: CSE								
Course Code	Category	Hours/ Week			Credits	Maximum Marks		
2440004	Basic Science	L	T	P	C	CIA	SEE	Total
		3	1	0	4	40	60	100
Contact Classes: 48	Tutorial Classes: Nil	Practical Classes: Nil			TotalClasses:48			
Prerequisites: Mathematics courses of first year of study.								

Course Overview:

This Course deals with basic probability theory & statistical techniques. Each method will be explained in theoretical with real life examples. Problem solving techniques will be taught with respect to the theory. Interpretation for these problems will be highlighted. More number of Exercise problems will be given for enhancing their problem-solving skills. The students will improve their ability to think critically, to analyse a real problem and solve it using a wide array of mathematical tools.

Course Objectives:

1. The Concept of Random variables.
2. The concept of Expectation
3. Probability distributions of single random variables.
4. The sampling theory and the concept of Estimation.
5. Testing of hypothesis and making statistical inferences.

Course Outcomes: After Completion of the Course, Students should be able to

1. Formulate and solve real world problems involving Random variables.
2. Identify probability distributions to various case studies.
3. Apply the concept of estimation to case studies.
4. Explain the concept of hypothesis testing and the procedure for performing large sample tests for proportions and means.
5. Illustrate the models random process in real world problems.

UNIT-I: Random Variables

Overview of the probability, Conditional Probability, Product Rule and the Baye's Rule (All rules without proof).

Random variables: Discrete and continuous random variables and their properties, Expectation, Mean and Variance of random variables.

UNIT-II: Probability distributions

Discrete Probability distributions: Binomial and Poisson distributions, statistical parameters for these distributions (without proof).

Continuous probability distributions: Normal, Uniform and Exponential distributions, statistical parameters for these distributions (without proof).

UNIT-III: Sampling Distribution & Estimation

Sampling Distributions: Random Sampling, Parameters and Statistics, Sampling Distribution of Means and the Central Limit Theorem, t - Distribution, F-Distribution, Chi-square distribution.

Estimation: Estimating the Mean, Standard Error of a Point Estimate, Confidence Intervals for single sample and two samples.

UNIT-IV: Sampling Distribution & Estimation

Sampling Distributions: Random Sampling, Parameters and Statistics, Sampling Distribution of Means and the Central Limit Theorem, t - Distribution, F-Distribution, Chi-square distribution.

Estimation: Estimating the Mean, Standard Error of a Point Estimate, Confidence Intervals for single sample and two samples.

UNIT-V: Test of Hypothesis & Stochastic process

Statistical Hypotheses: General concepts, testing a statistical hypothesis, Tests concerning large samples - single mean, two means, single proportion and two proportions.

Stochastic process: Introduction to Stochastic process, transition probability, transition probability matrix, stochastic matrix and regular matrix, Markov chain. Classification states.

TEXTBOOKS:

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics For Engineers & Scientists, 9th Ed. Pearson Publishers.
2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.
3. S.D. Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi.

REFERENCEBOOKS:

1. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, Ltd, 2004.
2. Sheldon M Ross, Probability and Statistics for Engineers and scientists, academic press.
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.

ELECTRONIC RESOURCES:

1. <https://www.youtube.com/watch?v=j9WZyLZCBzs>
2. <https://www.youtube.com/watch?v=UnzbuqgU2LE>
3. <https://www.youtube.com/watch?v=gI5v3RZe9fk>
4. <https://www.youtube.com/watch?v=l87zHfGW3Z4>
5. <https://www.youtube.com/watch?v=kjfIPyrdzuE>
6. <https://www.youtube.com/watch?v=IkbkEtOOC1Y>

MATERIALS ONLINE:

1. Course template
2. Tutorial question bank
3. Definitions and terminology
4. Assignments
5. Model question paper-I
6. Model question paper-II
7. Lecture notes
8. E-Learning Readiness Videos(ELRV)