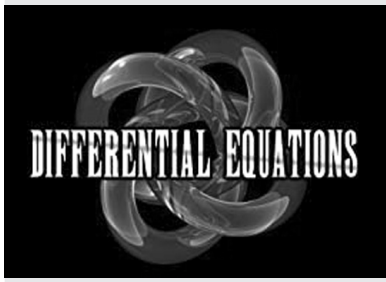
22ST202 PROBABILITY AND STATISTICS



Source: https://www.amazon.com/Differential-Equations/dp/B01H30X2JA

Hours Per Week :

L	T	P	C
3	0	2	4

PREREQUISITE KNOWLEDGE: Basic knowledge in statistics and mathematics.

COURSE DESCRIPTION AND OBJECTIVES:

To provide students with foundation in elementary topics of statistics and probability such as descriptive statistics, correlation, probability, random variables, correlation, regression, and testing of hypothesis. The course emphasizes statistics to solve engineering and management problems.

MODULE-1

UNIT-1 **12L+0T+8P=20 Hours**

DESCRIPTIVE STATISTICS

Basic Definitions, Frequencies, Graphical Representation, Histogram, Ogive curves; Measures of Central tendency, Arithmetic mean, Median, Mode, Mean deviation, Standard deviation; Symmetry and Skewness, Karl Pearson's Coefficient of skewness.

UNIT-2 **12L+0T+8P=20 Hours**

PROBABILITY AND RANDOM VARIABLES

Probability: Introduction, Definition (Classical and Axiomatic approach), Addition theorem, Conditional probability, Multiplication theorem and Bayes theorem.

Random Variables: Random variables, Discrete and Continuous variables and distribution function.

PRACTICES:

- Various graphical presentation techniques.
- Measures of central tendency.
- Skewness.
- Karl Pearson's coefficient of skewness.
- Applications of addition theorem.
- Applications of multiplication theorem.

MODULE-2

UNIT-1 **12L+0T+8P=20 Hours**

REGRESSION ANALYSIS AND DISTRIBUTIIONS

Correlation and Regression: Correlation, types, Pearson's coefficient of correlation, regression, regression lines.

Distributions: Introduction to distributions: Binomial, Poisson and Normal distributions with properties and applications.

UNIT-2 **12L+0T+8P = 20 Hours**

TESTING OF HYPOTHESIS

Testing large samples-one mean, two means, one proportion and two proportions. Testing small

SKILLS:

- ✓ *Collect the data from various data sources and evaluate mean, median, mode mean deviation and standard deviation.*
- ✓ *Identify the areas which we can apply the probability theory.*

samples- one mean, two means (independent and paired samples), Chi square tests-goodness of fit and independence of attributes.

PRACTICES:

- Correlation.
- Karl Pearson's coefficient of correlation.
- Regression and regression lines.
- Applications of statistical distributions.
- Testing the large sample tests-one mean and two sample means.
- One proportion and two proportion tests.
- Testing small samples-one, two samples and paired tests.
- Chi-square test for goodness of fit.
- Chi-square test for independence of attributes.

COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Module No.	Mapping with POs
1	Apply measures of central tendency, skewness, and Karl Pearson's coefficient of skewness to study the statistical data sets.	Apply	1	1,2
2	Apply the probability theory and their applications to measure the uncertainty.	Apply	1	1,2
3	Study the relations between statistical variables and can fit the mathematical models for association.	Analyze	2	1,2,3
4	Test the statistical significances for various samples.	Evaluate	2	1,2,4
5	Identify the distribution type to measure the occurrences of chance.	Evaluate	2	1,4,5

TEXT BOOKS:

1. Sheldon M. Ross, An Introduction to Probability and Statistics for Engineers and Scientists, 3rd Edition, Academic Press, Elsevier.
2. S. C. Gupta and V. K. Kapoor, "Fundamentals of Mathematical Statistics", Sultan Chand & Sons, 2012.

REFERENCE BOOKS:

1. P. R. Vittal, "Mathematical Statistics", Margham Publications, Chennai, 2018.
2. Kishore S. Trivedi, "Probability and Statistics with Realiability, Queueing and Computer Science Applications", 2nd edition, Wiley Student edition, 2008.
3. A. Singaravelu, "Probability and Statistics", 22nd edition, Meenakshi Agency, 2015.