

Computer Applications In Statistics

Semester II

Subject Code: BC21504

Lecture: 48

Objectives:

- The syllabus aims in equipping students with
- The power of excel spreadsheet in computing summary statistics.
- The concept of probability, probability distributions and simulations in business world and decision making.
- Balanced knowledge of theory as well as practical aspects of the subject.
- Knowledge in Operations Research.
- A culture of informed decision making using statistical models.

Unit 1: Population and Sample

12
Lects.

- Concept of Population and Sample, Attributes, Variables, Raw Data, Condensation, Classification of Grouped and Ungrouped Frequency Distribution. Creating Bar Charts, Pie Charts, Line Graphs, Histogram, Frequency Polygon and Ogives.
- Data Entry, Graphs and Diagrams using Excel Sheets.

09

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Unit 2: Methods of Counting **06**
Lects.

- Techniques of Counting. 01
- Permutation – Concept, Permutation of 'n' dissimilar objects taken 'r' at a time (With and Without Repetition), Circular Permutation. 02
- Combination – Concept, Combination of 'n' distinct objects taken 'r' at a time, Relation between Permutation and Combination, Theorems on Combination 03
- Numerical Problems.

Unit 3: Theory of Probability **12**
Lects.

- Set Theory and Venn Diagram (to be revised by students).
- Concept of Random Experiment, Outcome, Event, Sample Space, Mutually Exclusive, Exhaustive, Equally Likely, Trial, Tree Diagram. 03
- Classical Definition of Probability. Axioms of Probability, Impossible and Certain events. 01
- Theorems of Probability – i) Theorem of Total Probability or Addition Theorem for two and three events ii) Theorem of Compound Probability or Multiplication Theorem for two events. Conditional Probability and Independent Events. 04
- Bayes' Theorem. 01
- Drawing without Replacement, Repeated Trials – Drawing with Replacement, Mathematical Expectation, Theorems on Expectation. 03
- Numerical Problems.

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Unit 4: Standard Discrete Distribution

**10
Lects.**

- Random Variables, Discrete Probability Distribution, Continuous Probability Distribution. Cumulative Distribution Function. 03
- Concept of Probability Mass Function, Probability Density Function, Expectation, Mean and Variance of Discrete Distribution. 03
- Uniform Distribution (Discrete): Probability Distribution, Mean and Variance (without proof). 02
- Binomial Distribution: Bernoullian Trial, Probability Distribution, Important Properties of Mean and Variance. 02
- Numerical Problems.

Unit 5: Simulation Techniques

**08
Lects.**

- Introduction to Simulation, Meaning and Concept of Simulation, Merits and Demerits. 01
- Random Numbers- Definition, Uses, 01
- Pseudo-Random Number Generators, Requisites of a Good Random Number Generator. 02
- Monte Carlo Simulation. 04
- Numerical Problems.

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Recommended Text Books :

- Statistical Methods – S.P.Gupta, Sultan Chand,2005
- Statistics for Management - Richard I Levin and David S Rubin, Prentice Hall of India,1997
- Business Statistics – S.P.Gupta and M.P.Gupta, Sultan Chand,2008
- Statistical and Quantitative Methods – Ranjeet Chitale, Nirali Prakashan,2009
- Operations Research , Theory and Applications - J K Sharma, Macmillan Publishers,2009

Recommended Reference Books :

- Advanced Statistics – Gupta & Kapoor, Sultan Chand,1987
- Fundamentals of Statistics Volume-I & II – Goon , Gupta, Dasgupta, World Press, Calcutta,1986
- Operations Research, An Introduction - Hamdy A Taha, Pearson,2004
- Operations Research – S.D.Sharma , Kedar Nath Ram Nath & Co Publishers,2003

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