



STATISTICS
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[CORE COURSE]

Semester: I	Credits: 3	Subject Code: BC12005	Lectures: 48
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Course Outcomes:

At the end of this course the learner will be able to,

- Identify, assess and execute oneself effectively in a broad range of analytic, scientific, government, financial, health, technical and other positions.
- Determine, relate and evaluate the connections between theory and applications.
- Analyze, apply and experiment probabilistic foundations of statistical inference in business world and decision making.
- Develop strong communication skills which are necessary to effectively collaborate as part of interdisciplinary teams including the ability to interpret and communicate the results of a statistical analysis through oral and written reports.
- Define, validate, compose Simulation Models thus helping learner solve the Programming Problems in Operations Research.

Unit 1: Population and Sample	08
<ul style="list-style-type: none">• Definition of Statistics, Scope of Statistics in various other subjects. Concept of raw data, attributes, variables, population, sample, statistical error (residual), real life applications.• Methods of Sampling- Probabilistic and Non-Probabilistic.• Data condensation, classification, frequency distribution and cumulative frequency distribution• Graphs- Histogram, Frequency Polygon, Ogives (Less Than and More Than type). Determination of Median and Mode graphically. Diagrams- Line graph, Bars, Multiple Bars, Subdivided Bars, Component Bar Charts, Horizontal Bars, Pie Chart.• Numerical Problems	

Unit 2: Methods of Counting	07
<ul style="list-style-type: none">• Techniques of Counting.• Permutation – Concept, Permutation of 'n' dissimilar objects taken 'r' at a time (With and Without Repetition), Circular Permutation.• Combination – Concept, Combination of 'n' distinct objects taken 'r' at a time, Relation between Permutation and Combination, Theorems on Combination• Numerical Problems.	

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Unit 3: Theory of Probability	14
<ul style="list-style-type: none">• 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.• Classical Definition of Probability, Axioms of Probability, Impossible and Certain events.• 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.• Bayes' Theorem.• Drawing without Replacement, Repeated Trials – Drawing with Replacement, Mathematical Expectation.• Numerical Problems.	

Unit 4: Simulation Techniques	07
<ul style="list-style-type: none">• Introduction to Simulation, Meaning and Concept of Simulation, Merits and Demerits.• Random Numbers- Definition, Uses,• Pseudo-Random Number Generators, Requisites of a Good Random Number Generator.• Monte Carlo Simulation.• Numerical Problems.	

Unit 5: Game Theory	12
<ul style="list-style-type: none">• Introduction, Terminology• Pure Strategy Game Theory• Mixed Strategy Game Theory• Principle of Dominance• Limitations of Game Theory• Numerical Problems	

#12 hours for Library work, assignments, practical or field work

Recommended Text Books:
<ul style="list-style-type: none">• Dr. Teltumbade Ganesh, Barve Vishal Punjaram, <i>Business Statistics</i>, Thakur Publications, Pune, 2019• Dr. Patil Vaishali V, Prof Jadhav Pratibha V, <i>Elements of Statistics</i>, Thakur Publishers Pune, 2013-14

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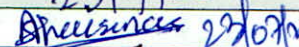
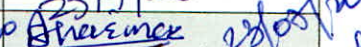


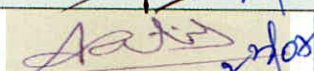
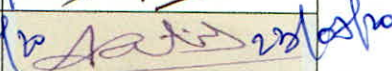


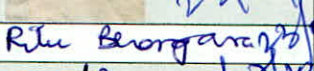
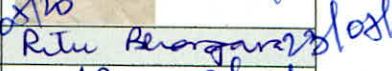
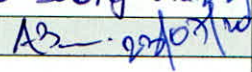
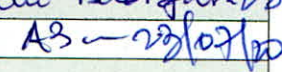
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- Saha Suranjan, *Basic Business Mathematics and Statistics*, New Central, Calcutta, 1994
- Agarwal B L, *Basic Statistics*, Wiley Publication, 1988
- Hodges J L, Lehmann E L, *Basic Concept of Probability and Statistics*, Vakil's Publication, 1972

Reference Books:

- Gupta S.P., *Statistical Methods*, Sultan Chand, 2005
- Levin Richard I and Rubin David S, *Statistics for Management*, Prentice Hall of India, 1997
- Gupta S.P, and Gupta M. P., *Business Statistics*, Sultan Chand, 2008
- Chitale Ranjeet, *Statistical and Quantitative Methods*, Nirali Prakashan, 2009
- Saha S and Mukherji S., *Quantitative Methods (Mathematical, statistical & Economic Techniques)*, Central's ICWA
- Black Ken, *Applied Business Statistics: Making Better Business Decisions*, Wiley India, New Delhi, 2012
- Beri G C, *Business Statistics*, Tata McGrawHill, New Delhi, 2010
- Bakshi Sandeep Kumar, *Business Statistics*, A. K. Publication, 2010

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