

B.A /B.Sc. 5th SEMESTER
STATISTICS
DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)
OPTION - I

ST520DA: STATISTICS: OPERATIONS RESEARCH

CREDITS: THEORY: 4, PRACTICAL: 2
MAXIMUM MARKS: THEORY: 60; PRACTICAL: 30

THEORY (4 CREDITS)

UNIT- I

Operations Research (OR): Introduction to Operations Research its Development, characteristics and scope. Importance of Operations Research in industry. Limitations of OR.

UNIT- II

Linear programming: Introduction to linear programming (LPP), Concepts of Convex set, basic solution, feasible solution, basic feasible solution, optimum solution and slack & surplus variables in linear programming problems (LPP). Mathematical formulation of LPP, Standard form of LPP, graphical method of solving LPP.

UNIT- III

Simplex Method: Iterative nature of simplex method, computational details of simplex algorithm and summary. Artificial variable techniques (Two-phase and Big-M techniques) for solving a general LPP.

UNIT- IV

Transportation Problem (TP): Mathematical formulation and tabular representation. Concept of feasible, Basic feasible and optimal solutions with reference to T.P. Methods for finding initial basic feasible solution : North-West Corner Rule, Lowest Cost Entry , Vogel's Approximation method.

REFERENCES

1. Gass S.I (1975): Linear Programming Methods and Applications, McGraw Hill.
2. S.D. Sharma (1994): Operations Research, Kedar Nath Ram Nath & Co, Meerut.
3. P. K. Gupta and D.S. Hira (2009): Operations Research, S. Chand New Delhi

ADDITIONAL REFERENCES:

1. H.A. Taha (2009): Operations Research: An introduction Person Prentice Hall

PRACTICAL (2 CREDITS)

MAXIMUM MARKS: 30

2. Formulation of LPPs.
3. Solving LPPs by graphical and simplex methods.
4. Solving LPPs by artificial technique.
5. Practicals based on transportation problems.

B.A /B.Sc. 5th SEMESTER
STATISTICS
DISCIPLINE SPECIFIC ELECTIVE COURSE (DSE)
OPTION - II

ST520DB: STATISTICS: DESIGN OF EXPERIMENTS

CREDITS: THEORY: 4, PRACTICAL: 2
MAXIMUM MARKS: THEORY: 60; PRACTICAL: 30

THEORY (4 CREDITS)

UNIT- I

Analysis of Variance (ANOVA): Assumptions and applications, ANOVA for one way and two way classification (using Principle of LSE). ANOVA table its interpretation and related examples.

Design of Experiments: Introduction, Terminology in experimental designs. Experiment, Experimental unit, Experimental Error, Treatments, Blocks, Replication, Precision, Contour Map, Yield, Uniformity Trials.

UNIT-II

Principles of Experimental Design:- Randomization, Replication and Local control. Completely Randomized Design (CRD): layout, analysis, advantages and disadvantages. Randomized Block Design (RBD): layout, analysis, advantages and disadvantages of RBD over CRD.

UNIT- III

Latin Square Design (LSD) layout, analysis of $m \times m$ LSD for one observation per experimental unit; advantages and disadvantages. Single missing observation analysis for LSD and RBD. Relative efficiency of LSD over RBD & CRD.

UNIT- IV

Factorial Experiments: Introduction. Main effects & interactions with reference to 2^2 & 2^3 factorial Experiments, Analysis of 2^2 & 2^3 design. Yates' method of calculating factorial effect totals and sum of squares due to effects.

REFERENCES

1. Croton F.E and Cowden D.J (1969): Applied General Statistics, Prentice Hall of India.
2. Goon A.M., Gupta M.K. Das Gupta B. (1986): Fundamentals of Statistics, Vol. II, World Press, and Calcutta.
3. Croton F.E and Cowden D.J (1969): Applied General Statistics, Prentice Hall of India
4. S.C Gupta and V.K Kapoor: Fundamentals of Applied Statistics. S. Chand New Delhi
5. Cochran W.G and Cox G.M (1957): Experimental Designs, John Wiley and sons.
6. Das M.N and Giri (1986): Design and Analysis of Experiments, Springer Verlag.

ADDITIONAL REFERENCES:

1. Gupta and Mukhopadhyay P.P: Applied Statistics, Central Book Agency.
2. Kempthorne O. (1965); The Design and Analysis of Experiments, Willey Eastern.

PRACTICAL (2 CREDITS)

MAXIMUM MARKS: 30

1. Analysis of variance in one-way classification.
2. Analysis of variance in two-way classification
3. Analysis of CRD.
4. Analysis of RBD.
5. Analysis of missing observation in RBD
6. Analysis of LSD
7. Analysis of 2^2 factorial Experiments.
8. Analysis of 2^3 factorial Experiments.