

Department of Statistics, Government Degree College Baramulla
Syllabus for B.A./B.Sc. Statistics (Honors) 8th Semester for Batch 2022 and Onwards

Title: Operations Research-II

Course No: STSC3822M **Semester:** 8th

Paper: III (Major)

No. of Credits: 4+2

Course Objectives: To introduce to students some advanced techniques of Operations Research.

Course outcomes: On successful completion of this course, the students will be able to:

- Understand the concepts of revised simplex method, duality in LPP, assignment problems, game theory and problems of sequencing
- Use different advanced techniques of Operation Research in real life problems.

Theory: 4 credits

UNIT -I

Revised Simplex method and its Applications, Duality in Linear programming problem (Concept only), Duality theorems: Weak duality theorem, Optimality criterion theorem, Unboundedness theorem, Fundamental theorem of duality, Complementary Slackness theorem and Complementary Slackness conditions and their applications. Dual Simplex Method and its Applications.

UNIT -II

Assignment Problem and its mathematical formulation, Methods of assignment problem, Special cases of Assignment problem.
Network Scheduling, Critical Path method, Project Evaluation Review Technique, Distinction between PERT and CPM. Application of network techniques in Industry.

UNIT -III

Game Theory: Introduction and its basic terminology. Strategy and its types. Decision Making in the face of competition, two-person Zero sum games, payoff matrix. Maximin and Minimax principles. Games without saddle point. Dominance principle and its applications. Graphical Solution of $2 \times n$ and $n \times 2$ games.

UNIT -IV

Problem of Sequencing, basic terms used in sequencing, processing n jobs through 2 machines, processing n jobs through k machines, processing 2 jobs through k machines, maintenance crew scheduling.

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Practical: 2 credits

Practical based on:

- Dual Simplex method.
- Critical Path method.
- Project Evaluation Review Technique.
- Assignment Problems.
- Dominance Rule.
- Graphical Solution of $2 \times n$ and $n \times 2$.
- Processing of n jobs through 2 machines.
- Processing 2 jobs through k machines.

Recommended Text Books & References:

- S.D. Sharma (2014): Operations Research (Theory Methods & Applications).
- Taha H.A. (1982): Operational Research, An introduction; Macmillan.
- Kanti Swarup, P.K. and Singh, M.M. (1985): Operation Research, Sultan Chand & Sons.
- J.K. Sharma (2012). Operations Research: Theory and Application.
- V.K. Kapoor: Operations Research (Quantitative Techniques for Management)