MBG5203 OPERATIONS RESEARCH

Course Code	MBG5203	Semester	II
Course Title	**OPERATIONS RESEARCH**		
Credits	3	Type	Core

This is a practice-oriented, aptitude-focused, problem-solving, and employability-based course.

Course Description

The course will expose students to various scientific tools and techniques with the aid of software changes in the operations of a business.

Course Outcome

By the end of the course, students will obtain the following course/learning outcome:

Knowledge gained:

- Understand the development of Operations Research and Linear Programming.
- Acquire know-how on Dynamic Programming, Capital Budgeting, and Game Theory.

Skills Gained:

- Learn various analytical algorithms and Project Evaluation Techniques.
- Get introduced to Queuing theory, Simulation, and Replacement Analysis of an asset.

Competency Gained:

- Examine the operational activities of an organization with the help of various models.

Course Structure

Module -I:

Stages of Development of Operations Research, Applications of Operations Research, Limitations of Operations, Introduction to Linear Programming, Graphical Method, Simple Method, Duality.

Module -II:

Transportation Problem, Assignment Problem, Inventory Control – Introduction to Inventory Management, Basic Deterministic Models, Purchase Models, Manufacturing Models without Shortages and with Shortages.

Module -III:

Shortest Path Problem, Floyd's Algorithm, Minimum Spanning Tree Problem, CPM/PERT, Crashing of a Project network. 24

Module **-IV:**

Dynamic Programming, Capital Budgeting Problem, Shortest Path Problem, Reliability Problem, Optimal subdividing problems. Game Theory: Two Person Zero-sum Games, Graphical Solution of (2 × n) and (m × 2) Games.

Module -V

Introduction to Queuing Theory, Basic Waiting Line Models: (M/M/1):(GD/α/α), (M/M/1):(GD/N/α), (M/M/C):(GD/α/α), (M/M/C):(GD/N/α), Introduction to queuing system simulation – Introduction to Basic Replacement Analysis: Economic Life of an Asset.

Testing & Evaluation (if any)

- Assignments
- Case analysis/ Problems
- Seminar/Project
- Discussions/ Group activity
- Internal Tests

References

1. Hamdy A. Taha, OPERATIONS RESEARCH – AN INTRODUCTION, Prentice Hall of India, New Delhi, 2004.
2. Frank S. Budrick, Dennis McLeavy& Richard Mojena, PRINCIPLES OF OPERATIONS RESEARCH FOR MANAGEMETN; II Ed., Richard D. Irwin Inc., 1988.
3. Hillier and Hillier, Introduction to Management Science, McGraw Hill International, New York, 2005. (2nd Edition)
4. Wagner, Harvey M. Principles of Operations Research, Prentice Hall of India, New Delhi, 2004. (2nd Edition)
5. KantiSwarup, et al, Operations Research, Sultan Chand and Sons, New Delhi.