Course Type	Course Code	Name of Course	L	T	P	Credit
DE	**NMSD 520**	**Advanced Decision Modelling**	**3**	**0**	**0**	**3**

Course Objective
This course shall expose the candidates to advanced quantitative models for decision making that aim at finding optimum or close to optimum results. Major emphasis shall be on problem formulation and selection of appropriate software packages for solution and interpretation of results.
Learning Outcomes
Upon successful completion of this course, students will understand how to formulate complex decision model for solving business or industrial engineering problems, get familiar with advanced Operations Research tools and techniques and their solution procedure using application software like MS Solver.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	**Integer Programming:** Integer programming and its application in managerial decision making, Gomory's Cutting Plane algorithm, Branch and Bound technique for solving Integer Programming Problems	7	Understand the concept of integer decision variables, its formulation and solution procedure
2	**Zero-one programming**: Balas algorithm for solving zero-one programming problems	7	Understand the concept of binary decision variables and its applications
3	**Dynamic programming:** Deterministic situation, Recursive nature in DP, forward and backward recursion, Its applications and solutions to problems	7	Understand the concept of dynamic problems and its applications
4	**Stochastic Programming models**	7	Understand the concept uncertainties in parameters and solution methods.
5	**Non- Linear Programming:** Constrained and Unconstrained algorithms for solving decision problems.	7	To get familiar with the non-linearity conditions in objective and constraints for problem solving
6	**Soft Optimization Method:** Genetic Algorithm.	7	To get familiar with the concept of genetic algorithm for problem solving
	TOTAL	**42**	

Text Books:

1. Operations Research: An Introduction- H.A. Taha, Macmillan, N.Y.
2. Principles of OR with Application to Managerial Decisions: H.M.Wagner, Prentice Hall.
3. Engineering Optimization: Theory and Applications: S.S.Rao, John Wiley and Sons.

Reference Books:

1. Introduction to Operations Research: F.S. Hiller and G.J. Lieberman, Addison Wesley.
2. Operations Research and Management Science, Hand Book: Edited By A. Ravi Ravindran, CRC Press, Taylor & Francis Group.