

Course Title:				Decision Models & Optimization					
Course Code:				BUL 6092					
Course Coordinator				Prof. Supran Kumar Sharma					
Credits				3-0-0					
Evaluation Scheme Total 100 Marks									
Quiz (Total 20 Marks)				Assignment/Project (Total 20 marks) (Minimum Two Assignments or one Project)		Mid-Term	Major Examination	Total	
Quiz I (5 marks)	Quiz II (5 marks)	Quiz III (5 marks)	Quiz IV (5 marks)			20 marks) (1 ½ Hour Duration)	(40 marks) (3 Hour Duration)	100 Marks	
WEEKS				TOPICS TO BE COVERED					
Week 1				Linear programming: general structure, formulation of product mix problems					
Week 2				Graphical and Simplex algorithm application for optimum solutions					
Week 3				Duality & Sensitivity analysis. Marketing applications, financial applications, production management applications					
Week 4				Transportation models and optimum solution: Transshipment Problems					
Week 5				Assignment models: Hungarian algorithm					
Week 6				Queuing system and introduction to stochastic processes, Measures of performance, Arrival and Service processes, Single server and multi-server models, channels in parallel with limited applications of Simple Queuing Decision Models					
Week 7				Game theory: two-person zero sum and constant sum games, saddle point, probability, nature as a player, two-person zero sum games: mixed or randomized strategy equilibria, domination, Graphical solution, Strategic form of prisoner's dilemma					
Week 8				Simulation and Optimization and applications. Simulation, Nature of simulation, simulation process, random number generation, applications of process to business related problems					
Week 9				Non-Linear Programming, Optimization Models: Integer Linear Programming-problems & applications. Goal Programming, Weighted and pre-emptive goal programming, Formulation of Goal programming problem and solutions.					
Week 10				Decision Analysis: Decision-making process, types of decision making environment: under certainty, under risk, under uncertainty, criteria of decision-making under uncertainty					
Week 11 (17th -21st March, 2025)				Mid-Term					
2nd May, 2025				Showing of Mid-Term Answer Sheets					

Week 13	Criteria of decision-making under risk; Decision tree; Precision Tree, Add-in Decision making under risk; Expected value, multistage decision problems. Decision noise and biasness
Week 14	Dynamic Programming: Production and Inventory control Problems, Shortest route problems and applications
Week 15	Multistage decision processes, Bellman's principle of optimality, Selective dynamic programming applications. Inventory Models: Economic order quantity and Economic production lot size.
Week 16	Multistage decision processes, Bellman's principle of optimality, Selective dynamic programming applications. Inventory Models: Economic order quantity and Economic production lot size
Week 17 (5th -9th May, 2025)	Revision Week
Week 18 (13th – 22nd May, 2025)	Major Examinations
29th May, 2025	Showing of Major Exams Answer Sheets

Course Outcomes:**Upon successful completion of this course, the student:**

1. Will be exposed to the various issues related to qualitative and quantitative techniques of optimization.
2. Will be able to develop skills to formulate and apply the techniques of optimization and simulation to solve problems of business world.
3. Will be able to formulate decision models to solve real life problem and proficiently allocating scarce resources to optimize the objective function.
4. Will be exposed to the strategies to be played to compete in competitive business world.

Recommended Books:

- Anderson, D.R. Sweeney, D.J. and Williams, T.A. An Introduction to Management Science, Thomson Publisher
- Ravindran, D. T. Phillips and James J. Solberg, Operations Research- Principles and Practice, John Wiley & Sons.
- F.S. Hillier. G.J. Lieberman, Introduction to Operations Research- Concepts and Cases, Tata McGraw Hill.
- Vohra N.D, Quantitative Techniques in Management, Tata McGraw Hill
- Wayne Winston and Chris, Albright Practical Management Science.

Calendar of Quizzes/Assignment etc. to be provided as per below details and exact dates to be fixed in consultation with other course coordinators to avoid overlap of Quizzes of different courses.

Component	Date
Quiz-I	29th January, 2025
Quiz-II	28th February, 2025
Assignment-I	29th January, 2025
Mid-Term	17-21st March, 2025

Assignment-II/ Project Submission	21 st April, 2025
Quiz-III	7 th April, 2025
Quiz-IV Surprise	
Major Exam	13 th – 22 nd May, 2025

Note:

1. One surprise Quiz may be fixed out of Quiz-II, Quiz-III or Quiz-IV.
2. In case of any deviation in evaluation methodology for courses such as AEC/VAC/SEC shall be mentioned accordingly. Thus, same shall be approved by the next BoS of school if not done earlier.



06/01/2025

Signature of Course Coordinator :