Semester	II	Specialization	NA
Course Code	204	Type	Generic - Core
Course Title	Decision Science		

Course Objectives:	
1	To understand role of quantitative techniques in managerial decision making.
2	To understand process of decision problem formulation.
3	To understand applications of various quantitative techniques in managerial settings.

Syllabus:

Unit Number	Contents	Number of Sessions
1	**1.1 Introduction:** Importance of Decision Sciences & Role of quantitative techniques in decision making. **1.2 Assignment Models:** Concept, Flood's Technique/ Hungarian Method, applications including restricted & multiple assignments. **1.3 Transportation Models:** Concept, Formulation, Problem types: Balanced, unbalanced, Minimization, Maximization Basic initial solution using North West Corner, Least Cost & VAM, Optimal Solution using MODI.	9+2
2	**2.1 Linear Programming:** Concept, Formulation & Graphical Solution **2.2 Markov Chains & Simulation Techniques:** Markov chains: Applications related to management functional areas, Implications of Steady state Probabilities, Decision making based on the inferences Monte Carlo Simulation, scope and limitations.	8+2
3	**3.1 Decision Theory:** Concept, Decision under risk (EMV)& uncertainty **3.2 Game Theory:** Concept,2 by 2 zero sum game with dominance, Pure & Mixed Strategy **3.3 Queuing Theory:** Concept, Single Server (M/M/I , Infinite, FIFO) and Multi Server (M/M/C , Infinite, FIFO)	6+2
4	**4.1 CPM & PERT:** Concept, Drawing network, identifying critical path **Network Calculations:** Calculating EST, LST, EFT, LFT, Slack & probability of project completion **4.2 Sequencing problems:** Introduction, Problems involving n jobs- 2 machines, n jobs- 3 machines & n jobs-m machines; Comparison of priority sequencing rules.	6+2

5	**5.1 Probability**: Concept, Addition, Conditional Probability theorem based decision making, (Numerical based on functional areas of business expected). **5.2 Probability Distributions:** Normal, Binomial. Interval estimation, standard errors of estimation.	6+2

Learning Resources:		
1	Text Books	Quantitative Techniques in Management by N.D. Vohra Tata, McGraw Hill Publications, 4th Edition Quantitative Approaches to Management by Levin, Rubin, Stinson & Gardner Operations Research Theory & Applications by J K Sharma- MacMillan Publishers India Ltd., 4th Edition Quantitative techniques & statistics By K L Sehgal Himalaya Publications
2	Reference Books	An introduction to management science: Quantititave approcach for decision making- Cengage Learning-Anderson Introduction to Operations Research by Billey E. Gilett, TMGH Operations Research by Nita Shah, Ravi Gor, Hardik Soni, PHI Managerial Decisions Modeling with Spreadsheets by Bal Krishnan, Render, Stair, Jr., Pearson Education. Operations Research by R. Pannerselvam, Prentice Hall India, 2nd Edition.
3	Supplementary Reading Material	Operations Research by Hamdy A. Taha, Pearson Publication
4	Websites	www.orsi.in
5	Journals	International Journal of Operations and Quantitative Management International Journals of Operations Research and Management Science Journal of Operation Management Research Indian Journal of Advanced Operations Management