

B.Tech 7th Semester (Mechanical Engineering)

Lesson Plan: Operations Research (PCC-ME-403)

Sr No.	Course Plan	Course covered	Remarks (if any)
Chapter: 1 Introduction			
1	Operation Research: Various Definition	L1	
2	Scope and applications of OR in industry	L2	
3	Concept on O.R. model building –Types & methods	L3	
4	Role of operations research in decision-making,	L4	
Chapter: 2 Linear Programming (LP)			
5	Programming definition, formulation	L5	
6	LPP solution- graphical method	L6	
7	LPP solution -simplex methods	L7	
8	Gauss-Jordan reduction process in simplex methods	L8	
9	LPP solution -BIG-M methods	L9	
10	Problems	L10	
11	Problems	L11	
Chapter: 3 Deterministic Model			
12	Transportation model-balanced & unbalanced, north west rule	L12	
13	Least cost or matrix minimal, Vogel's Method	L13	
14	Optimality Test- Stepping stone method, MODI method	L14	
15	Assignment problem	L15	
16	Duality, Primal-Dual relations-its solution	L16	
17	Shadow price, Economic interpretation,	L17	
18	dual-simplex	L18	
19	Post-optimality & sensitivity analysis	L19	
20	Problems	L20	
Chapter: 4 Waiting Line Models			
21	Introduction, queue parameters,	L21	
22	M/M/1 queue Rule	L22	
23	Performance of queuing systems	L23	
24	Applications in industries,	L24	
25	Problems	L25	

Chapter: 5 Project Line Models			
26	Network diagram, event, activity	L26	
27	Introduction PERT	L27	
28	Problems	L28	
28	CPM	L29	
30	float in network	L30	
31	variance and probability of completion time	L31	
32	project cost- direct, indirect, total, optimal project cost by crashing of network	L32	
33	Problems	L33	
34	Resource leveling in the project	L34	
35	Problems	L35	
Chapter: 6 Simulation& Decision theory			
36	Introduction, Design of simulation	L36	
37	Model and Experiments, model validation, process generation	L37	
38	time flow mechanism	L38	
39	Monte Carlo methods- its applications in industries, Problems	L39	
40	Decision process, SIMON model types of decision-making environment risk	L40	
41	decision making environment uncertainty	L41	
42	decision making with utilities, Problems	L42	

List of Reference

- 1. Operation Research: Hira and Gupta- S. Chand Publication**
- 2. Operations Research: Kanti Swarup, Gupta, Man Mohan**
- 3. Operations Research - Theory and Applications: J K Sharma**
- 4. Operations Research- An introduction: Hamdy A. Taha-Pearson Publication**