B.Tech. 7th Semester (Mechanical Engineering)

Lesson Plan of Operations Research (PCC-ME-702/21)

S. No.	Content to be Covered	Lect. No.
	UNIT-1 Introduction	
1	Introduction of operations research (OR), role of operations research in decision-making	**1**
2	Applications of OR in industry	**2**
3	Concept on OR model building –Types & methods	**3**
4	Concept on OR model building –Types & methods …	**4**
	UNIT-2 Linear Programming (LP)	
5	Introduction to Linear Programming, formulation	**5**
6	Formulation of LPP	**6**
7	Formulation of LPP	**7**
8	Graphical Solution of LPP	**8**
9	Simplex Solution of LPP	**9**
10	Simplex Solution of LPP …	**10**
11	Big-M method of LPP	**11**
12	Duality in LPP	**12**
13	PRIMAL-DUAL relations-its solution	**13**
14	shadow price, economic interpretation	**14**
15	dual-simplex, post-optimality & sensitivity analysis	**15**
	UNIT-3 Deterministic Model	
16	Introduction to Transportation model-balanced & unbalanced, Initial Basic Feasible Solution methods	**16**
17	Initial Basic Feasible Solution using north west rule, least cost or matrix minimal	**17**
18	Initial Basic Feasible Solution using Vogel's Method	**18**
19	Optimal solution using Stepping stone method	**19**
20	Optimal solution using MODI method	**20**
21	Degeneracy cases in transportation problem	**21**
22	Route prohibited cases in transportation problem	**22**
23	Assignment problems	**23**
24	Traveling Salesman problems	**24**
	UNIT-4 Waiting Line Models	
25	Introduction to waiting line models, queue parameters	**25**
26	Kendall's Notation, M/M/1 queue	**26**
27	Performance of queuing systems	**27**

Name of Teacher: Dr. Rajeev Kumar Saha

28	applications in industries, problems	**28**
	UNIT-5 Project Line Models	
29	Network diagram, event, activity, defects in network	**29**
30	PERT & CPM, float in network	**30**
31	Variance and probability of completion time	**31**
32	Project cost- direct, indirect, total	**32**
33	Introduction to crashing of network	**33**
34	Resources levelling in project	**34**
35	Problems	**35**
36	Problems …	**36**
	UNIT-6 Simulation and Decision Theory	
37	Introduction to simulation, design of simulation	**37**
38	Models & experiments, model validation, process generation, time flow mechanism	**38**
39	Monte Carlo methods- its applications in industries	**39**
40	Decision process, SIMON model	**40**
41	types of decision-making environment - certainty, risk, uncertainty, decision making with utilities	**41**
42	Problems	**42**