



*Strategic Plan for Learning and Teaching*  
*Department of Chemical Engineering*

<b>Branch Name:</b>	Chemical Engineering (CHE)	<b>Session :</b>	2018-2019
<b>Subject Name:</b>	Operations Research	<b>Year:</b>	4 <sup>th</sup>
<b>Subject Code:</b>	CHE 705B	<b>Semester :</b>	7 <sup>th</sup>

<b>Course Objective:</b>	<ul style="list-style-type: none"> <li>Identify and develop operational research models from the verbal description of the real system.</li> <li>Understand the mathematical tools that are needed to solve optimization problems.</li> <li>Use mathematical software to solve the proposed models.</li> <li>Develop a report that describes the model and the solving technique, analyze the results and propose recommendations in language understandable to the decision-making processes in Management Engineering.</li> </ul>
<b>Course Outcome:</b>	<ul style="list-style-type: none"> <li>Acquire the knowledge of Linear Programming Problems (LPP), Transportation &amp; Assignment Problems, Network Analysis, Game Theory, Queuing Theory</li> <li>Decision Theory and apply simplex method for linear optimization problems</li> </ul>

**Teaching-Learning Plan:**

Lecture Class No.	Reference to the WBUT Syllabus	Subject Topics to be discussed/ covered/ delivered	Text book / Referred book SI.No.
1	Module I	Introduction to Operations Research (OR), Definition of OR, Characteristics of OR, Necessity of OR in industry, Objectives of OR.	1,2,3
2		Scope of OR in management, Objectives of OR, Types of mathematical models, Role of computer in OR.	
3		Requirements for linear programming problem ( LPP), Examples on the application of LPP.	
4		Graphical solution of Two Variables LPP.	
5		Solution of Problems on graphical solution of Two Variables LPP.	
6		Solution of Problems on graphical solution of Two Variables LPP.	
7		Development of Simplex Method with examples.	
8		Problems on Simplex Method.	
9		Solution of Problems on Simplex Method.	
10		Solution of Problems on Simplex Method.	
11		Solution of Problems on Big-B Method.	
12		Solution of Problems on Big-B Method.	
13	Module II	Duality in LPP with problems.	3,4,5
14		Solution of Problems on Dual Simplex.	
15		Introduction to Assignment Model with examples.	
16		Solution of Problems on Assignment Problem.	
17		Solution of Problems on Assignment Problem.	
18		Travelling Salesman Problem.	

19		Solution of Problems on Travelling Salesman Problem.	
20		Introduction to Transformation Model with examples.	
21		Solution of Problems on Transformation Problem.	
22		Solution of Transformation Problem by using VAM.	
23		Solution of Transformation Problem by using VAM.	
24		MODI Method of optimality.	
25		Solution of Problems on MODI Method of optimality.	
26	Module III	Sensitivity Analysis with problems.	1,2,4,6
27		Introduction to Dynamic Programming, its need.	
28		Solution of Problems on Dynamic Programming.	
29		Solution of Problems on Dynamic Programming.	
30		Introduction to Decision Theory.	
31		Solution of Problems on Decision Theory.	
32		Solution of Problems on Decision Theory.	
33		Introduction to Game Theory with examples.	
34		Solution of Problems on Game Theory.	
35		Solution of Problems on Game Theory.	
36	Module IV	Introduction to Queuing Models with examples.	4,5
37		Solution of Problems on Queuing Model I.	
38		Solution of Problems on Queuing Model II.	
39		Solution of Problems on Queuing Model III.	
40		Introduction to PERT & CPM.	
41		Formation of PERT network.	
42		Numbering of network by Fulkerson's rule.	
43		Critical path network diagram.	
44		Critical path network diagram.	
45		Crashing of the critical path.	
46		Solution of Problems on Crashing of the critical path.	
47		Schedule for a Class Test	

**Recommended Text/ Reference Books:**

Sl.No.	Name of Text/ Reference Book	Name of Author	Publisher & edition
1	Optimization Theory & Applications	S.S.Rao,	Wiley Eastern Ltd.
2	Operations Research- An Introduction-	H.A.Taha (EEE)	7th edition, - PHI.
3	Linear Programming and Game Theory	Chakravorty & Ghosh	Moulik Library
4	Operations Research with C Programs-.	S. Kalavatty-	Vikas Publishing House Pvt. Ltd
5	Operations Research	K.Swarup, P.K.Gupta, &Man Mohan	Sultan Chand & Sons.
6	European Journal of Operational Research		Elsevier

**Course Co-ordinator / Faculty**

Sl. No.	Name of the Course Co-ordinator / Faculty	Signature of Course coordinator / Faculty		Signature of HOD	
1	Dr. Projjwal Sarkar				
2	Dr. Pronoy Kumar Sinha				