GUJARAT UNIVERSITY
BCA V SYLLABUS

COURSE TITLE	FC301 Operation Research
COURSE CODE	FC-301
COURSE CREDIT	2
Session Per Week	3
Total Teaching Hours	40 HOURS

AIM

This course aims to equip the students with the basic knowledge of Operations research like Linear Programming, Transportation, and Assignment Problems, Sequencing problems and PERT – CPM Simulations.

LEARNING OUTCOMES

The student would be able
To understand general concept of Operation Research Techniques.
To know the Phases and processes of OR.
To easily identify the application area of Operation Research given the problem area..

DETAIL SYLLABUS

UNIT	TOPIC / SUB TOPIC	TEACHING HOURS
	Operations Research and Linear Programming	**10**
1	❖ **Operations Research** ➤ History of Operations Research ➤ Decision Making ➤ Framework for Decision Making ➤ Classification of Operations Research Models ❖ **Linear Programming** ➤ Listing the Common Linear Programming Problems ➤ Basic Terminology ➤ Assumptions of a Linear Programming Model ➤ Introduction of Graphical Solution ➤ Simplex Method and its strategy ➤ Big M Method ➤ Solving problem using excel solver	
2	**Transportation**	**10**

	❖ **Transportation Problems**
	  ➢ Transportation Problem and Its Solution
	  ➢ Northwest Corner Rule
	  ➢ Least Cost Method
	❖ **Assignment Problem**
	  ➢ Assignment problem and its solution	

3	**Sequencing Problems**	**10**
	❖ Methods to Solve Single Machine Scheduling Problems ❖ Johnson's Algorithm for Solving N jobs and Two/Three Machine Problem ❖ Three Machine And N Jobs Scheduling Problems using Johnson's Algorithm Extension ❖ Job Shop Scheduling: Two Jobs and M Machines	
4	**Network Models, Simulation**	**10**

	❖ **Network Model**
	  ➢ Network Minimization
	  ➢ Maximum Flow Problem
	  ➢ Linear Programming Approach to Network Problems
	❖ **Simulation**
	  ➢ Introduction
	  ➢ Monte-Carlo Simulation and its Application	

Text Book

❖ Operations Research
Publisher: Cengage Learning
By M.V.Durga Prasad
 	
  ➢ **Chapter – 1** (1.1, 1.2, 1.3, 1.4)
  ➢ **Chapter – 2** (2.1, 2.2, 2.3, 2.5(Overview), 2.6, 2.7, 2.8, 2.11)
  ➢ **Chapter – 4** (4.1, 4.1.1 (Except Vogel's Approximation Method), 4.3)
  ➢ **Chapter – 8** (8.1, 8.2, 8.3, 8.4)
  ➢ **Chapter – 9** (9.1, 9.2, 9.3)
  ➢ **Chapter – 15** (15.1, 15.2, 15.3)

REFERENCE BOOKS:

1. Operations Research (Edition 2008)
    Publisher : McGraw Hill
    By P Sankara Iyar
  2. Operation Research (Edition- 2010)
    Publisher: Jaico Publishing House
    By Aditham B. Rao