3010 – OPERATIONS RESEARCH

Teaching Schedule Per Week			Progressive Assessment	Examination Schedule (Marks)			
Lectures	Practical	Credits		Theory		Practical Ex.	Total
3	-	3	25	3Hrs.	100	-	125

Pre-requisite	Source
Nil	MCL

Semester	Theory	Test	Total	TW	PR	Gr Total

Updated on 8/8/2000

RATIONALE: Optimisation of pre-sources is an urgent need of the hour in any walk of life in general, and in engineering in particular. Operations Research introduces the various heuristic and mathematical approaches to various engineering, management and financial problems. Thus every engineer should learn the basics of Operations Research.

COURSE CONTENTS	Hrs	Mks
1. INTRODUCTION Definition, necessity and use of operations research in industry / use, application of Operations Research., limitations of Operation Research.	2	-
2. LINEAR PROGRAMMING Introduction; Formulation of L.P. model; Graphical solution of two-variable L.P. problems; Multiple solutions, (Introduction and definitions only) unbounded solutions, infeasible solution, redundant constraints. (Introduction only). Simplex methods – Two variables.	8	16
3. TRANSPORTATION MODEL Introduction; Definition, mathematical representation of transportation models. Formulation and optimal solution of transportation model: North West Corner Rule method, R.W. Minima method, Column Minima Method, Least Cost Method, Vogel's Approximation Method (VAM).	8	16
4. ASSIGNMENT MODEL Definition. Comparison with transportation model; Mathematical representation of Assignment Model; Formulation and optimal solution of Assignment Models.	8	16
5. SEQUENCING Introduction; Processing 'n' jobs through two machines; Definition and study of Johnson's Rule; Processing 'n' jobs through three machines.	4	12
6. QUEUING MODEL Introduction; Basic Terminology in Queuing; Characteristics of queuing model. Introduction to different types of queuing models; Single server queuing model with problems.	6	12
7. NETWORK ANALYSIS Introduction to CPM and PERT; Basic Terminology like activity, event, path, dummy activity, network/arrow; Network Construction: Fulkerson's Rule, concept of start and finish/end activities, Activity On Node (AON). Critical Path Method (CPM): CPM Terminology, Critical Path and Sub-Critical Path, Float, Negative Float, analysis of network using forward and backward pass. Program Evaluation and Review Technique (PERT): Three time estimates, frequency distribution (β– distribution), slack, analysis of network, crashing the network and cost analysis.	12	28
Total	48	100

Teaching Method: - Computer orientation may be supplemented wherever possible.

REFERENCE BOOKS

1. Quantitative Techniques in Management – N. D. Vohra – Tata McGraw Hill.
2. Operations Research – Prem Kumar Gupta and D.S. Hira – S. Chand & Co., Ltd.,
3. Operations Research – Hamdy A. Taha – Prentice Hall of India.
4. Operation Research – Principles and Practice – Ravindran, Philips, Solberg – John Wiley & Sons.
5. The Management Guide to PERT and CPM – J.D. Wiest and F.K. Levy.
6. PERT and CPM, Principles and Application – L.S. Srinath.
7. Operations Research - Brownson Richard
8. Operations Research – R.C. Patel, N.R. Dave – Schaum's Outline Series.