

BHARATHIAR UNIVERSITY, COIMBATORE.
B.Sc. Mathematics
(revised papers with effect from 2015-16 onwards)

Note: The revised syllabi for the following papers furnished below be followed from the academic year 2015-16 onwards and there is no change in the existing scheme of examination and syllabi of remaining papers.

Semester III - Skill Based Subject - Operations Research – Paper I
Credit hours: 3

Subject description:

This course contains advantages, limitations and applications of O.R, formulation of Linear Programming Problems (L.P.P), methods to solve L.P.P. like simplex method, Charnes Penalty Method and Two Phase Simplex method. Also it deals about duality in L.P.P and Transportation with applications

Goal:

It enables the students to use the mathematical knowledge in optimal use of resources.

Objectives:

On successful completion of this course students should have gained knowledge about optimal use of resources.

Unit I:

Basics of O.R – Definition of O.R – Characteristics of O.R - Scientific methods in O.R – Necessary of O.R in Industry – O.R and Decision Making – Scope of O.R in Modern Management – Uses and limitations of O.R. Linear Programming Problem – Formulation of L.P.P .

Unit II:

Graphical solutions of L.P.P – Problems. Simplex Method – Problems

Unit III:

Charnes Penalty Method (or) Big – M Method - Two Phase Simplex method – Problems.

Unit IV:

Duality in L.P.P – Concept of duality – Duality and Simplex Method – Problems

Unit V:

The transportation Problems – Basic feasible solution by L.C.M – NWC- VAM- optimum solutions – unbalanced Transportation problems

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi

2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd.

SEMESTER IV - SKILL BASED SUBJECT

SUBJECT TITLE - OPERATIONS RESEARCH – PAPER II CREDIT HOURS: 3

Subject Description:

This course gives emphasis to enhance student knowledge in Assignment Problems, game theory, performance measures of queues and optimal use of Inventory.

Unit I:

The Assignment Problems – Assignment algorithm – optimum solutions – Unbalanced Assignment Problems.

Unit II:

Game Theory – Two person zero sum game – The Maxmini – Minimax principle – problems - Solution of 2 x 2 rectangular Games – Domination Property – (2 x n) and (m x 2) graphical method – Problems.

Unit III:

Queueing Theory – Introduction – Queueing system – Characteristics of Queueing system – symbols and Notation – Classifications of queues – Problems in (M/M/1) : (∞ /FIFO)

Unit IV:

Problems in (M/M/1):(N/FIFO); (M/M/C) : (∞ /FIFO); (M/M/C) : (N/FIFO) Models.

Unit V:

Inventory control – Types of inventories – Inventory costs – EOQ Problem with no shortages – Production problem with no shortages – EOQ with shortages – Production problem with shortages – EOQ with price breaks.

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi
2. Operations Research – Kandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd.

SEMESTER V - SKILL BASED SUBJECT

SUBJECT TITLE: OPERATIONS RESEARCH – PAPER III - CREDIT HOURS: 3

Subject Description:

This course presents applications and method to solve Network Scheduling, Integer Programming Problems, Non-linear Programming Problems and Dynamic Programming problems.

Unit I:

Simulation – Introduction – simulation models – Event – Types of simulation - Generation of Random Numbers – Monte-carlo simulation – simulation of queueing system.

Unit II:

Network scheduling by PERT / CPM – Introduction – Network and basic components – Rules of Network construction – Time calculation in Networks – CPM.

PERT – PERT calculations – Cost Analysis – Crashing the Network – Problems.

Unit III:

Integer Programming Problem – Gomory's fractional cut Method – Branch and Bound Method.

Unit IV:

Non-linear Programming Problems – General NLPP – Lagrange multiplier – Hessian bordered Matrix – Kuhn Tucker Condition – Problems

Unit V:

Dynamic Programming Problem – Recursive equation approach – D.P.P Algorithm – Solution of L.P.P by D.P.P.

References:

1. Operations Research – Prem Kumar Gupta D. S. Hira, S. Chand & Company Ltd, Ram Nagar, New Delhi
2. Operations Research – Khandiswarup, P. K. Gupta, Man Mohan, S. Chand & Sons Education Publications, New Delhi, 12th Revised edition.
3. Operations Research Principles and Problems: S. Dharani Venkata Krishnan, Keerthi publishing house PVT Ltd

SEMESTER-VI
SKILL BASED SUBJECT
SUBJECT TITLE: OPERATIONS RESEARCH - PAPER -IV

SUBJECT DESCRIPTION:

This course enhances the students knowledge in decision analysis, sequencing the jobs to be carried out based on cost optimization; improve the power on replacement policies; analyse the cases according to their categories and improves the programming techniques.

Unit I:

Decision Analysis – Decision Making environment – Decisions under uncertainty – Decision under risk – Decision – Tree Analysis.

UNIT--II:

SEQUENCING PROBLEMS

Introduction-problem of sequencing - basic terms used in sequencing- processing n-jobs through 2 machines - processing n -jobs through k machines -- processing 2 jobs through k machines(Problems only).

UNIT-III

REPLACEMENT PROBLEMS

Introduction - Replacement of equipment / assets that deteriorates gradually - replacement of equipment that fails suddenly and problems.

UNIT--IV:

INFORMATION THEORY:

Introduction- A measure of Information-Axiomatic Approach to Information- Entropy-The expected information- Some properties of entropy function-Joint and conditional entropies.

UNIT -- V :

APPLICATIONS:

General solution of (mxn) rectangular games using simplex method - Reliability and system failure rates using replacement problems.

REFERENCES :

1. Operations research ; Kandiswarup ; P. K. Gupta ; Man Mohan ; S.Chand &sons education publications ; New Delhi.
2. Operations research : P K Gupta ; D S Hira ; S. Chand and company ltd. Ram Nagar; New Delhi.
3. Operations research principles problems ; S Dharani venkata krishnan ;keerthi publishing house Pvt. Ltd.