GANPAT UNIVERSITY

FACULTY OF ENGINEERING & TECHNOLOGY

Programme	Master of Technology			Branch/Spec.	Electrical (Electrical Power System)/ (Renewable Energy)
Semester	II			Version	1.0.0.0
Effective from Academic Year		2025-2026		Effective for the batch Admitted in	July 2025
Course Code	3EE21OE3	Course Name		Operations Research	

Teaching scheme						Examination scheme (Marks)			
(Per week)	Lecture(DT)		Practical(Lab.)		Total		CE	SEE	Total
	L	TU	P	TW					
Credit	3	0	0	0	3	Theory	40	60	100
Hours	3	0	0	0	3	Practical	00	00	00

Pre-requisites:

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Course Outcomes

On successful completion of the subject, students should be able to:

CO1	Understand the fundamentals of optimization models including linear, non-linear, and dynamic programming.
CO2	Apply linear and non-linear programming methods such as simplex, dual simplex, and Kuhn-Tucker conditions to solve optimization problems.
CO3	Analyze inventory models, scheduling, sequencing, and queuing models to support decision-making in operations.
CO4	Evaluate and develop advanced strategies using game theory, network flow, and simulation for complex problem-solving scenarios.

Theory syllabus

Unit	Content	Hrs
1	**Optimization Techniques:** Optimization techniques, Model formulation, Models, General L.R formulation, Simplex techniques, Sensitivity analysis, Inventory control models.	**09**
2	**Linear Programming Problems:** Formulation of an LPP, Graphical solution revised simplex method, Duality theory, Dual simplex method, Sensitivity analysis, Parametric programming.	**09**
3	**Non-Linear Programming:** Non-linear programming problem, Kuhn-Tucker conditions, Min-cost flow problem, Max flow problem, CPM/PERT.	**08**
4	**Programming Models:** Scheduling and sequencing, single server and multiple server models, Deterministic inventory models, Probabilistic inventory control models, Geometric programming.	**09**
5	**Dynamic Programming:** Competitive models, Single and multi-channel problems, Sequencing models, Dynamic programming, Flow in networks, Elementary graph theory, Game theory simulation.	**10**

Practical content

Assignments and tutorials are based on the above syllabus.

Text Books

1.	H.A. Taha, Operations Research, An Introduction, PHI.
2.	H.M. Wagner, Principles of Operations Research, PHI, Delhi.
3.	J.C. Pant, Introduction to Optimisation: Operations Research, Jain Brothers, Delhi.

Reference Books

1.	Hitler Libermann Operations Research: McGraw Hill Pub.
2.	Pannerselvam, Operations Research: Prentice-Hall of India.
3..	Harvey M Wagner, Principles of Operations Research: Prentice-Hall of India.

ICT/MOOCs

1.	https://nptel.ac.in/courses/111/107/111107128/
2.	https://onlinecourses.nptel.ac.in/noc20_ma23/preview

Mapping of CO with PO and PSO:															
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	2	0	2	0	0	0	0	0	2	0	2	3	2	0
CO2	2	3	2	3	2	0	0	0	1	2	1	1	3	2	0
CO3	3	2	2	1	1	0	0	0	0	0	2	2	3	2	0
CO4	3	3	2	3	3	2	0	0	2	2	1	1	3	3	2