IV Year II Semester	L	T	P	To	C
	4	-	-	4	4

MT 430 OPTIMIZATION TECHNIQUES (ELECTIVE - VI)

Course Description & Objectives:

To familiarize students with Linear Programming and Nonlinear Programming and their applications to various engineering and science disciplines were including economics and finance.

Course Outcomes:

On completion of this course, students would be able to:

1. *learn optimization and optimization techniques*
2. *solve algorithms by dynamic programming technique*

UNIT I: Unconstrained Optimization:

Optimizing Single-Variable Functions, conditions for Local Minimum and Maximum, Optimizing Multi-Variable Functions. **Constrained Optimization**: Optimizing Multivariable Functions with Equality Constraints, Direct Search Method, Lagrange Multipliers Method, and Constrained Multivariable Optimization with inequality constraints, Kuhn-Tucker Necessary conditions, Kuhn –Tucker Sufficient Conditions.

UNIT II: Optimization Methods:

Quasi-Newton Methods and line search, least squares optimization, Gauss-Newton, Levenberg- Marquartd, Extensions of LP to Mixed Integer Linear Programming (MILP), Non-Liner Programming, The Newton Algorithm, Non-Linear Least Squares, Sequential Quadratics Programming (SQP), Constrained Optimization, SQP Implementation, Multi-Objective Optimization, Branch and Bound Approaches.

UNIT III: Optimization and Functions of a Complex Variable and Numerical Analysis:

The Finite Differences Method for Poisson's Equation in two Dimensions and for the Transient Heat Equation, Eulers Method, The Modified Euler Method and the Runga-Kutta Method for Ordinary Differential Equations, Gaussian Quardative Tranzoidal Rules and Simpson's 1/3 and 3/8 Rules, the Newton Raphson in one and two Dimensions, Jacobi's Iteration Method.

UNIT IV: Dynamic Programming:

Transportation, Linear Optimization, Simplex and Hitchcock Algorithms, Minimax and Maxmin Algorithms, Discrete Simulation, Integer Programming, Cutting Plane Methods,

UNIT V: Programming Techniques:

Separable Programming, Stochastic Programming, Goal Programming,

Integer Linear Programming, Pure and Mixed Strategy in theory of Games, Transhipment Problems, Heuristic Methods.

TEXT BOOKS:

1. Winston W L, “Operations Research: Applications and Algorithms”.
2. Rao S.S., “Optimization: Theory and Applications”.

REFERENCES:

1 Walsh G R, “Methods of Optimization”.

2 Williams H.P., “Model Building in Mathematics Programming”.

IV Year II Semester	L	T	P	To	C
	4	-	-	4	4

MT 432 MANAGEMENT OF TECHNOLOGY (ELECTIVE - VI)

Course Description & Objectives:

This course familiarizes students with evolution of technology, selection of technology, technology transfer management and configuration management.

Course Outcomes:

On completion of this course, students would be able to:

1. *manage industrial as well as research problems.*
2. *acquire knowledge of technology management*
3. *gain knowledge of innovation in different technologies.*

UNIT I: Introduction:

Introduction to technology management, Concept and meaning of technology, Evolution and growth of technology, role and significance of management of technology, Impact of technology on society and business, Forms of technology, process technology and product technology.

UNIT II: Research Management:

Competitive advantages through new technologies, product development, from scientific breakthrough to marketable product, Role of Government in Technology, Development, Linkage between technology, development and competition, Managing research and development (R&D), Managing Intellectual Property.

UNIT III: Technology Monitoring:

Technological Forecasting, Exploratory: Intuitive, Extrapolation, Growth Curves, Technology Monitoring, Normative, Relevance Tree, Morphological Analysis, Mission Flow Diagram, Technology Assessment, Technology Choice, Technological Leadership and Followership, Technology Acquisition. Meaning