OPTIMIZATION TECHNIQUES

Code: PCCAIML 402
Contacts: 3L

Name of the Course:	**OPTIMIZATION TECHNIQUE**
Course Code:PCCAIML402	Semester: IV
Duration: 6 months	Maximum Marks: 100
Teaching Scheme	**Examination Scheme**
Theory:3 hrs./week	Mid Semester exam: 15
Tutorial: NIL	Assignment and Quiz: 10 marks
	Attendance: 5 marks
Practical: NIL	End Semester Exam: 70 Marks
Credit Points:	3

Course Objectives

1.Use Matlab to implement important optimization methods.
2. Learn efficient computational procedures to solve optimization problems
3.Cast engineering minima/maxima problems into optimization framework.

Unit	Content	Hrs/Unit	Marks/Unit
1	Introduction: Historical Development, Engineering applications of optimization, Statement of an optimization problem, Classification of optimization problems	2	
2	Classical Optimization Techniques: Single variable optimization, Constrained and unconstrained multivariable optimization, Relevant applications	5	
3	Linear Programming: Standard form of a linear programming problem, Simplex method, Duality in linear programming, Quadratic programming, Stochastic linear programming, Relevant applications	6	
4	Nonlinear Programming: Unimodal function, Interpolation methods, Direct and indirect methods, Relevant applications	4	
5	Geometric Programming: Unconstrained and constrained geometric programming problems, Geometric programming with mixed inequality	5	
6	Integer Programming: Integer linear programming, Integer nonlinear programming, Relevant applications	4	
7	Game Theory: Introduction, Characteristics of Game Theory, Two Person, Zero sum games, Pure strategy. Dominance theory,	2	

8	Genetic Algorithms: Introduction, Representation methods, Selection methods, Operators, Replacement methods, Relevant applications	2	

Text book and Reference books:

1. Rao, S. S., & Rao, S. S., Engineering optimization: theory and practice. John Wiley & Sons.
2. Hadley, G., Linear programming, Narosa Publishing house.
3. Taha, H. A., Operations research: An introduction. Pearson Education India.
4. Deb. K, Optimization for engineering design: Algorithms and examples. PHI Learning Pvt. Ltd.
5. Kumar, D. N., Multicriterion analysis in engineering and management. PHI Learning Pvt. Ltd.

Course Outcomes:

At the end of the course, students will be able to –

1. Relate key concepts and applications of various optimization techniques
2. Identify the appropriate optimization technique for the given problem
3. Formulate appropriate objective functions and constraints to solve real life optimization problem

Artificial Intelligence Lab
Code: PCCAIML 491
Contacts: 4P

Name of the Course:	Artificial Intelligence & Functional Programming Lab
Course Code: PCC-AIML491	Semester:IV
Duration:6 months	Maximum Marks:100
Teaching Scheme:	
Theory: hrs./week	Continuous Internal Assessment
Tutorial: NIL	External Assesement:60
Practical: 4 hrs./week	Distribution of marks:40
Credit Points:	2
COURSE OBJECTIVES	
1. Gain a historical perspective of AI and its foundations.	
2. Become familiar with basic principles of AI toward problem solving, inference, perception, knowledge representation, and learning.	
3. Investigate applications of AI techniques in intelligent agents, expert systems, artificial neural networks and other machine learning models.	
4. Experience AI development tools such as an ‘AI language’, expert system shell, and/or data mining tool.	
5. Experiment with a machine learning model for simulation and analysis	