Th-4 (a) ARTIFICIAL INTELIGENCE & MACHINE LEARNING (Elective)

Theory	4 Periods per week	Internal Assessment	20 Marks
Total Periods	60 Periods	End Sem Exam	80 Marks
Examination	3hours	Total Marks	100Marks

A.   Topic wise distribution of periods

Sl. No.	Topics	Periods
1	ITRODUCTION TO AI	08
2	SEARCH ALGORITHMS	10
3	KNOWLEDGE REPRESENTATION AND REASONING	08
4	MACHINE LEARNING	10
5	PATTERN RECOGNITION	08
6	CLASSIFICATION	08
7	EXPERT SYSTEM	08
	TOTAL	**60**

B. **RATIONALE**

AI has significantly progressed and today forms an important part of industry and technology. Brain-Like AI aims at analyzing and deciphering the working mechanisms of the brain and translating this knowledge into implementable AI architectures with the objective to develop in this way more efficient, flexible, and capable technical systems. AI has many applications from Game playing to Natural Language processing, expert systems etc.

C. OBJECTIVE :

After completion of this course the student shall be able to
- Know what is AI and what are its application
- What are the searching Algorithms
- Knowledge representation forms
- Pattern recognition principles and applications
- Machine Learning methods
- Expert System approaches

D. COURSE CONTENTS:

1. **Introduction to AI**
   1.1 Definition of AI, History of AI
   1.2 Goals and Applications of AI
   1.3 Intelligent agent
   1.4 Computer vision
   1.5 Natural Language Processing
   1.6 Turing test
   1.7 Problem solving in Games

2. **Introduction to Search Algorithm**

   2.1 Search, Search space, Search Tree
   2.2 Categories and Types of Search
   2.3 Heuristic Algorithm vrs Solution Guaranteed Algorithm
   2.4 Local search and Optimal problem(Hill climbing, BFS,A*,AO*)
   2.5 Adversarial Search
   2.6 AI and Game Playing

3. **Knowledge Representation and Reasoning**
   3.1What to represent, Knowledge
   3.2 Properties of Knowledge Representation System, Approaches
   3.3 Knowledge Representation
   3.4 Reasoning and Types of reasoning

4. **Machine Learning**
   4.1 Machine Learning
   4.2 Statistical or Unsupervised Learning
   4.3 ML Properties
   4.4 Reinforcement Learning
   4.5 Decision Tree

5. **Pattern Recognition**
   5.1 Introduction to Pattern recognition
   5.2 Design Principles of Pattern recognition system
   5.3 Statistical Pattern recognition System
   5.4 Machine Perception
   5.5 Line Finding and Interception
   5.6 Object Identification

6. **Expert System**
   6.1 Introduction to Expert system
   6.2 Basic Architecture
   6.3 Type of Problem Solved by Expert system
   6.4 Features of an Expert System
   6.5 Expert System Architectures
   6.6 Expert System Tools
   6.7 Existing Expert Systems
   6.8 Applications of Expert System Technology

Coverage of Syllabus upto Internal Exams (I.A.)
Chapter 1,2,3

BOOKS Recommended:-

Sl.No	Name of Authors	Title of the Book	Name of the publisher
1	Pankaj Sharma	Artificial intelligence	Katson Books
2	Munesh Chandra Trivedi	A Classical approach to Artificial intelligence	Khanna Books