



## FACULTY OF ENGINEERING & TECHNOLOGY

### First Year Master of Engineering

### Semester II

**Course Code: 102320204**

**Course Title: Artificial Intelligence**

**Type of Course: Program Elective III**

**Course Objectives:** Focus of Artificial Intelligence is to solve complex problems in CAD/CAM and Engineering using different algorithms for decision making.

#### Teaching & Examination Scheme:

Contact hours per week			Course Credits	Examination Marks (Maximum / Passing)				
Lecture	Tutorial	Practical		Internal		External		Total
				Theory	J/V/P*	Theory	J/V/P*	
3	0	2	4	30/15	20/10	70/35	30/15	150/75

\* J: Jury; V: Viva; P: Practical

#### Detailed Syllabus:

Sr.	Contents	Hours
1	Introduction: Definitions, overview of AI application areas, AI as Representation and search: the predicate calculus, application.	5
2	STRUCTURES AND STRATEGIES FOR STATE SPACE SEARCH: Introduction, Graph theory, Strategies for state space search using the state space to represent, Reasoning with the Predicate Calculus.	6
3	HEURISTIC SEARCH: Algorithm, admissibility, informedness, using heuristic in Games and complexity issues.	6
4	CONTROL AND IMPLEMENTATION OF STATE SPACE SEARCH: Recursion based Search, Pattern-Directed search and production systems.	6
5	MACHINE LEARNING: Symbol based, connectionist, social and emigrant.	5
6	ADVANCED TOPICS: AI Problem Solving: Automated reasoning and Understanding natural language.	5
7	RECENT DEVELOPMENT: Knowledge based systems, Expert Systems and AI in manufacturing as case studies published in research papers.	6



## Suggested Specification table with Marks (Theory) (Revised Bloom's Taxonomy):

Distribution of Theory Marks						R: Remembering; U: Understanding; A: Application, N: Analyze; E: Evaluate; C: Create
R	U	A	N	E	C	
20	20	20	25	10	5	

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

## Reference Books:

1	Artificial Intelligence, Elaine Rich and Kevin Knight, Tata Mcgraw-Hill.
2	Artificial Intelligence: A Modern Approach, Stuart Russel, Peter Norvig, PHI.
3	Introduction to Prolog Programming, Carl Townsend.
4	PROLOG Programming for Artificial Intelligence, Ivan Bratko.
5	Programming with PROLOG, Klocksins and Mellish.

## Course Outcomes (CO):

Sr.	Course Outcome Statements	%weightage
CO-1	Understand various search methods	30
CO-2	Use various knowledge representation methods	25
CO-3	Understand various Game Playing techniques	25
CO-4	Use Prolog Programming language using predicate logic	20

## List of Practicals / Tutorials:

1	Introductory exercise for 3-D modelling.
2	Write a program to implement Tic-Tac-Toe game problem.
3	Write a program to implement BFS (for 8 puzzle problem or Water Jug problem or any AI search Problem).
4	Write a program to implement DFS (for 8 puzzle problem or Water Jug problem or any AI search Problem)
5	Write a program to implement Single Player Game (Using Heuristic Function)
6	Write a program to Implement A* Algorithm.
7	Write a program to solve N-Queens problem.
8	Write a program to solve 8 puzzle problem.
9	Write a program to solve travelling salesman problem.

## Supplementary learning Material:

1	NPTEL: <a href="https://nptel.ac.in/courses/106/105/106105077/">https://nptel.ac.in/courses/106/105/106105077/</a>
2	NPTEL: <a href="https://nptel.ac.in/courses/106/102/106102220/">https://nptel.ac.in/courses/106/102/106102220/</a>

## Curriculum Revision:

Version:	1
Drafted on (Month-Year):	Apr-20
Last Reviewed on (Month-Year):	Jul-20
Next Review on (Month-Year):	Apr-22