

VASAVI COLLEGE OF ENGINEERING (Autonomous)

IBRAHIMBAGH, HYDERABAD – 500 031

DEPARTMENT OF INFORMATION TECHNOLOGY**Introduction to Artificial Intelligence****(AI&ML TRACK : OPEN ELECTIVE-III)**

(Common for CIVIL, ECE, EEE & MECH)

SYLLABUS OF B.E V-SEMESTER

L:T:P (Hrs./week): 3:0:0	SEE Marks : 60	Course Code: U24OE520IT
Credits : 3	CIE Marks : 40	Duration of SEE : 3 Hrs

COURSE OBJECTIVES	COURSE OUTCOMES <i>On completion of the course, students will be able to</i>
The objective of this course is to provide the necessary fundamentals, approaches in Artificial intelligence for problem solving for a goal-based single or multi agents with or without constraints and formalise soft computing techniques for better optimization for intelligent systems.	1. Investigate applications of AI techniques in intelligent agents. 2. Apply various search algorithms for demonstrating agents, searching and inferencing 3. Analyse searching beyond classical search and adversarial Techniques. 4. Identify problem types which might have constraints and evolutionary computation. 5. Define the fuzzy systems, ethics and risks of AI.

UNIT-I:**Introduction to AI:** What is AI, Foundations of AI, History of AI, State of the Art, Applications of AI.**Intelligent Agents:** Agents and Environments, Good Behaviour: The Concept of Rationality, The Nature of Environments, The Structure of Agents.**UNIT-II:****Solving Problems by Search:** Problem Solving Agents, Example problems, Searching for Solutions, Uninformed Search Strategies: Breadth first search, Depth-first search, Depth limited search, Iterative deepening depth first search**Informed (Heuristic) Search Strategies:** Greedy best first search, A* Search, Optimality of A*, Heuristic Functions.**UNIT-III:****Beyond Classical Search:** Local search and optimization problems, Local search in continuous spaces, Searching with non-deterministic actions and partial observations.**Adversarial Search:** Games, Optimal decisions in games, Alpha-Beta Pruning, Imperfect real time decisions.**UNIT-IV:****Constraint Satisfaction Problems:** Defining Constraint Satisfaction Problems, Constraint Propagation, Backtracking Search for CSPs, Local Search for CSPs, The Structure of Problems.**Introduction to Evolutionary Computation:** Representation – The Chromosome, Initial Population, Fitness Function, Selection, Reproduction Operators, Stopping Conditions, Evolutionary Computation versus Classical Optimization.**UNIT-V:****FUZZY Systems, Logic and Reasoning:** Fuzzy Sets- Formal Definitions, Membership Functions, Fuzzy Operators, Fuzzy Set Characteristics, Fuzziness and Probability, Fuzzy Inferencing.**Philosophical foundations:** Weak AI, Strong AI, Ethics of AI and Risks of AI.**Learning Resources:**

1. Artificial Intelligence A Modern Approach Third Edition – Russell & Norvig
2. Computational Intelligence: An Introduction, 2nd Edition - Andries P. Engelbrecht
3. <https://online.stanford.edu/courses/cs221-artificial-intelligence-principles-and-techniques>
4. <https://nptel.ac.in/courses/106105077>
5. <https://ocw.mit.edu/courses/6-034-artificial-intelligence-spring-2005/>

The break-up of CIE: Internal Tests+ Assignments + Quizzes

1	No. of Internal Tests:	2	Max.Marks for each Internal Tests:	30
2	No. of Assignments:	3	Max. Marks for each Assignment:	5
3	No. of Quizzes:	3	Max. Marks for each Quiz Test:	5
Duration of Internal Test: 90 Minutes				