SOCIETY OF ST. FRANCIS XAVIER, PILAR'S
FR. CONCEICAO RODRIGUES COLLEGE OF ENGINEERING
(Approved by AICTE & Affiliated to University of Mumbai)
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Artificial Intelligence & Data Science

(Academic Year :2023-2024)

Course Code: CSC503	
Course Name: Artificial Intelligence	
Course Teacher: Prof. Saurabh Kulkarni	
Course Outcomes (CO): ***At the End of the course students will be able to***	
CO.1	Identify the characteristics of the environment and differentiate between various agent architectures
CO.2	Apply a suitable search strategy to design problem solving agents
CO.3	Design knowledge-based agents using knowledge representation and inference rules.
CO.4	Apply a probabilistic model for reasoning under uncertainty
CO.5	Describe various learning techniques

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Course Lesson Plan

Sr. No.	Proposed Date	Topics	Delivery Mode	CO	Assessment Tool	Ref. book	Actual Date	Remark
1	11/7	Information about syllabus, assessment and course outcomes, Introduction to AI	Lecture	--	--	1		
2	12/7	AI Perspectives, Acting and thinking humanly, Acting and thinking rationally	Lecture	CO1	UT1, Q1	1		
3	14/7	History of AI, Applications of AI, The present state of AI, Ethics in AI, **Quiz 1: MCQ based quiz as a part of the flipped classroom**	Lecture	CO1	UT1, Q1	1		
4	18/7	Introduction to agents, Structure of intelligent agent	Lecture	CO1	UT1	1		
5	19/7	characteristics of intelligent agents , types of agents: Simple reflex	Lecture	CO1	UT1	1		
6	21/7	Model-based agents	Lecture	CO1	UT1	1		
7	24/7	Types of agents: Goal-based, utility-based	Lecture	CO1	UT1	1		
8	27/7	Definition of search and state space representation	Lecture	CO2	UT1, A1	1		
9	28/7	Problem as state space search, problem formulation	Lecture	CO2	UT1, A1	1,2		Cancelled due to Rain
10	31/7	Well-defined problems	Lecture	CO2	UT1, A1	1,2		
11	03/8	Solving problems by searching	Lecture	CO2	UT1, A1	1,2		
12	04/8	Performance evaluation of search strategies, time complexity, space complexity, completeness, optimality	Lecture	CO2	UT1, A1	1		

13	07/8	Uninformed search: DFS	Lecture	CO2	UT1, A1	1		
14	10/8	Iterative deepening and bi-directional search	Lecture	CO2	UT1, A1	1		
15	11/8	BFS, uniform cost search, comparison of all the uninformed search techniques	Lecture	CO2	UT1, A1	1		
16	14/8	Informed search: Heuristic function, Admissible heuristic	Lecture	CO2	UT1, A1	1		
	15/8	**Independence Day**						
	16/8	**Parsi New Year**						
17	17/8	Greedy best first search	Lecture	CO2	UT1, A1	1		
18	18/8	A* search	Lecture	CO2	UT1, A1	1		
19	21/8	Informed search with example	Lecture	CO2	UT1, A1	1		
20	24/8	Local search: Hill climbing	Lecture	CO2	UT1, A1	1		
21	25/8	Simulated annealing, genetic algorithm	Lecture	CO2	UT1, A1	1		
	28/8	**Unit Test-1**		CO1,2				
	29/8	**Unit Test-1, Mid-Term Feedback**		CO1,2				
22	31/8	Adversarial search: Mini Max Technique	Lecture	CO2	A1	1		
23	01/9	Adversarial search: Mini Max with alpha beta pruning	Lecture	CO2	A1	1		
	02/9	**Assignment 1: Coding assignment**						
24	04/9	Definition and importance of knowledge, issues in knowledge representation, knowledge representation systems, properties of knowledge representation systems	Lecture	CO3	UT2, Q2	1		
25	07/9	Propositional logic- syntax, semantics, formal connectives, truth tables	Lecture	CO3	UT2, Q2	1		
26	08/9	Tautology, validity, well-formed formula, Prolog introduction	Lecture	CO3	UT2, Q2	1, R1		
27	11/9	Predicate logic- FOPL, syntax, semantics, quantification	Lecture	CO3	UT2, Q2	1		
28	14/9	Inference rules in FOPL	Lecture	CO3	UT2, Q2	1		
29	15/9	Forward chaining, backward chaining	Lecture	CO3	UT2, Q2	1		
	16/9	Remedial session		CO1,C				

				O2				
30	18/9	CNF (Pre-requisite to understand Resolution)	Lecture	CO3	UT2, Q2	1,2		
	19/9	Shri Ganesh Chaturthi						
31	21/9	Resolution in FOPL **Quiz 2: Online Quiz**	Lecture	CO3	UT2, Q2	1		
32	22/9	Handling uncertain knowledge, random variables	Lecture	CO4	UT2, Q3	1		
33	25/9	Prior and posterior probability	Lecture	CO4	UT2, Q3	1		
	28/9	Anant Chaturdashi						
34	29/9	Full joint distribution	Lecture	CO4	UT2, Q3	1		
	02/10	Gandhi Jayanti						
35	05/10	Bayes rule and its use	Lecture	CO4	UT2, Q3	1		
36	06/10	Bayesian belief network and inference **Quiz 3: Online quiz**	Lecture	CO4	UT2, Q3	1,3		
	09/10	Unit Test-2		CO3,4				
	10/10	Unit Test-2		CO3,4				
37	12/10	The planning problem, partial order planning, total order planning	Lecture	CO5	A2	1,3		
38	13/10	Assignment 2: pre-requisite (concept of supervised, unsupervised, semi supervised, reinforcement learning, ensemble learning)	Lecture	CO5	A2	1,3		
39	16/10	Expert system- concepts and components	Lecture	CO5	A2	1,3		
40	19/10	**Assignment 2- Coding assignment on machine learning**		CO5	A2	1		
41	23/10	Course end and remedial session	Lecture	CO3,4,5		1		Synergy
	30/10	Dashahera						
		University ESE Examination						

Text Books:

1. Stuart J. Russell and Peter Norvig, "Artificial Intelligence A Modern Approach", Pearson Education, 2nd edition.
2. Elaine Rich and Kevin Knight, “Artificial Intelligence”, Tata McGraw-Hill Education Pvt. Ltd., 3rd edition.
3. George F Luger, “Artificial Intelligence”, Pearson Education., 4th edition.

Reference Books:

1. Ivan Bratko,"PROLOG Programming for Artificial Intelligence”, O`Reilley publication, Pearson Education, 3rd edition
2. D. W. Patterson, “Artificial Intelligence and Expert Systems”, Prentice Hall.
3. Saroj kaushik, “Artificial Intelligence”, Cengage Learning.
4. Davis E. Goldberg, “Genetic algorithms: Search, Optimization and Machine Learning”, Addison Wesley, N.Y., 1989.
5. Patrick Henry Winston, “Artificial Intelligence”, Addison-Wesley, Third Edition
6. N. P. Padhy, “Artificial Intelligence and Intelligent Systems”, Oxford University Press

Course Instructor: Prof. Saurabh Kulkarni