

PESIT Bangalore South Campus
Department of Computer Science and Engineering

Subject: ARTIFICIAL INTELLIGENCE

Subject Code: 15CS562

Academic year: 2017 -2018

Semester: V

Faculty: Prof Arti Arya, Prof K S V Krishna Srikanth

Course Description:

In this course, we will study the most fundamental knowledge for understanding AI. AI is the sub-area of computer science devoted to creating software and hardware to get computers to do things that would be considered ‘intelligent’ as if people did them. Artificial intelligence has had an active and exciting history and is now a reasonably mature area of computer science. We will introduce some basic search algorithms for problem solving; knowledge representation and reasoning, Game playing and NLP.

Prerequisite: Strong experience of programming languages, Good knowledge of Discrete mathematics

Course objectives: This course will enable students to

- Identify the problems where AI is required and the different methods available
- Compare and contrast different AI techniques available.
- Define and explain learning algorithms

Course Plan (No. of Lecture Hours: 40)

Class	Chapter Title	Topics to be Covered	Book	% of portion covered	
				Reference Chapter	Cumulative
1	MODULE I	Introduction	TB1 Chap. 1,2,4,5 ,6,7,8, 9,10	20%	20%
2		Definition & Importance of AI.			
3		Problems, Problem Spaces and search,			
4		Predicate Logic			
5		Representing knowledge using Rules			
6		Symbolic Reasoning under Uncertainty			
7		Statistical Reasoning			
8		Weak Slot and Filter Structures			
9	MODULE II	Defining the problem as state space search	TB1 Chap. 3	20%	40%
10		production system, problem Characteristics			
11		Heuristic search techniques- Generate and test, Hill Climbing,			
12		Best-First Search,			
13		Problem Reduction			
14		Constraint Satisfaction			
15		Means-ends Analysis			
16		State of Art Game programs			

Class	Chapter Title	Topics to be Covered	Book	% of portion covered	
				Reference Chapter	Cumulative
17	MODULE III	Game Playing: Minimax search procedure,	TB1 Chap. 12,15	20%	60%
18		Adding alpha-beta cutoffs, additional refinement.			
19		Iterative Deepening and references on specific games			
20		Natural Language Processing: Syntactic Processing,			
21		Semantic Analysis,			
22		Discourse and Pragmatic processing,			
23		Statistical Natural language processing			
24		Spell checking			
25	MODULE IV	Learning: What is learning?, Forms of learning	TB1 Chap. 17	20%	80%
26		Rote learning, learning by taking advice			
27		Learning in problem solving			
28		Induction learning			
29		Explanation based learning, Discovery, Analogy			
30		Formal learning Theory			
31		Neural Network Learning			
32		Genetic Learning			
33	MODULE V	Expert Systems: Basic Concepts of Expert Systems,	TB2 Chap. 12	20%	100%
34		Application of Expert Systems			
35		Structure of Expert Systems			
36		Knowledge Engineering			
37		Problem Area suitable for Expert Systems			
38		Developments			
39		Benefits of Expert Systems			
40		Expert Systems on Web			

Course outcomes: The students should be able to:

- Identify the AI based problems
- Apply techniques to solve the AI problems
- Define learning and explain various learning techniques
- Discuss on expert systems

Text Books:

1. E. Rich , K. Knight & S. B. Nair - Artificial Intelligence, 3/e, McGraw Hill. Chapters 1,2,3,4,5.5.7,8,9,10,12,15,17
2. Decision Support and Business Intelligence Systems E Turban, R Sharda and D. Delen Pearson 9-Edition Chapter 12

Reference Books:

1. Artificial Intelligence: A Modern Approach, Stuart Rusell, Peter Norving, Pearson Education 2nd Edition.
2. Dan W. Patterson, Introduction to Artificial Intelligence and Expert Systems – Prentice Hal of India.
3. G. Luger, “Artificial Intelligence: Structures and Strategies for complex problem Solving”, Fourth Edition, Pearson Education, 2002.
4. Artificial Intelligence and Expert Systems Development by D W Rolston-Mc Grawhill.
5. N.P. Padhy “Artificial Intelligence and Intelligent Systems” , Oxford University Press-2015.