

Course code	Course Name	L-T-P - Credits	Year of Introduction
CS464	ARTIFICIAL INTELLIGENCE	3-0-0-3	2016
Course Objectives: <ul style="list-style-type: none"> To introduce basic principles that drive complex real world intelligence applications. To introduce and discuss the basic concepts of AI Techniques and Learning 			
Syllabus: Introduction to AI, Solving Problems by Searching-uninformed, informed, heuristic, constraint Satisfaction problems -AI Representational Schemes-Learning-Advanced searches-Alpha beta pruning, Expert Systems-Natural Language Processing Concepts.			
Expected Outcome: The Student will be able to : <ol style="list-style-type: none"> appreciate the scope and limits of the artificial intelligence (AI) field assess the applicability, strengths, and weaknesses of the basic knowledge representation interpret the role of knowledge representation, problem solving, and learning explain various search algorithms (uninformed, informed, and heuristic) for problem solving comprehend the fundamentals of Natural Language Processing 			
Text Books: <ol style="list-style-type: none"> E Rich, K Knight, Artificial Intelligence, 3/e, Tata McGraw Hil, 2009. George.F.Luger, Artificial Intelligence- Structures and Strategies for Complex Problem Solving, 4/e, Pearson Education. 2002. 			
References: <ol style="list-style-type: none"> D. Poole and A. Mackworth. Artificial Intelligence: Foundations of Computational Agents, Cambridge University Press, 2010 Available online: http://artint.info/ Dan W Patterson, Introduction to Artificial Intelligence,Pearson,2009 Deepak Khemeni,A First course in Artificial Intelligence,Tata McGraw Hill,2013 Maja J. Mataric ,Robotics Primer,MIT press,2007 Patrick Henry Winston,Artificial intelligence,Addisson wessley,1992 Stefan Edelkamp, Stefan Schroedl, Heuristic Search: Theory and Applications, Morgan Kaufman, 2011. Stuart Jonathan Russell, Peter Norvig, Artificial intelligence, A modern approach,3rd edition, pearson,2010 			

Course Plan			
Module	Contents	Hours	End Sem. Exam Marks
I	Introduction: What is AI, The foundations of AI, History and applications, Production systems. Structures and strategies for state space search. Informed and Uninformed searches.	5	15%
II	Search Methods: data driven and goal driven search. Depth first and breadth first search, DFS with iterative deepening. Heuristic search-best first search, A * algorithm.AO* algorithm, Constraint Satisfaction. Crypt Arithmetic Problems	8	15%
FIRST INTERNAL EXAMINATION			
III	AI representational schemes- Semantic nets, conceptual dependency, scripts, frames, introduction to agent based problem solving, Machine learning-symbol based-a frame work for symbol based learning.	6	15%
IV	Advanced Search: Heuristics in Games, Design of good heuristic-an example. Min-Max Search Procedure, Alpha Beta pruning,	6	15%
SECOND INTERNAL EXAMINATION			
V	Learning Concepts: Version space search. Back propagation learning. Social and emergent models of learning-genetic algorithm, classifier systems and genetic programming.	9	20%
VI	Expert Systems: rule based expert systems. Natural language processing-natural language understanding problem, deconstructing language. Syntax stochastic tools for language analysis, natural language applications	9	20%
END SEMESTER EXAM			

Question Paper Pattern (End semester exam)

- There will be **FOUR** parts in the question paper – A, B, C, D
- Part A**
 - Total marks : 40**
 - TEN** questions, each have **4 marks**, covering **all the SIX modules (THREE** questions from **modules I & II; THREE** questions from **modules III & IV; FOUR** questions from **modules V & VI).**
All the TEN questions have to be answered.

3. Part B

- a. **Total marks : 18**
- b. **THREE** questions, each having **9 marks**. One question is from **module I**; one question is from **module II**; one question *uniformly* covers **modules I & II**.
- c. **Any TWO** questions have to be answered.
- d. Each question can have **maximum THREE** subparts.

4. Part C

- a. **Total marks : 18**
- b. **THREE** questions, each having **9 marks**. One question is from **module III**; one question is from **module IV**; one question *uniformly* covers **modules III & IV**.
- c. **Any TWO** questions have to be answered.
- d. Each question can have **maximum THREE** subparts.

5. Part D

- a. **Total marks : 24**
 - b. **THREE** questions, each having **12 marks**. One question is from **module V**; one question is from **module VI**; one question *uniformly* covers **modules V & VI**.
 - c. **Any TWO** questions have to be answered.
 - d. Each question can have **maximum THREE** subparts.
6. There will be **AT LEAST 60%** analytical/numerical questions in all possible combinations of question choices.

