

COURSE OUTLINE OF RECORD

Dept., Number	CSC 3390	Course Title	Artificial Intelligence
Semester Hours	3		
Year	2006	URL (if any):	

Current Catalog Description:

This course covers definition of heuristic versus algorithmic methods, rationale of the heuristic approach, description of cognitive processes, objectives of work in artificial intelligence, simulation of cognitive behavior and heuristic programming techniques. It also includes a survey of examples from representative application areas including expert systems, the mind-brain problem and the nature of intelligence. Individual projects to illustrate basic concepts are required. Prerequisites: CSC 2331 and MAT 2337.

Textbook:

Stuart Russell and Peter Norvig. *Artificial Intelligence: A Modern Approach*. Prentice-Hall, 1995.

References:

1. William Clocksin and Christopher Mellish. *Programming in Prolog*. Springer-Verlag, 1994.
2. Ivan Bratko. *Prolog Programming for Artificial Intelligence*. Addison-Wesley, 1990.
3. Patrick Henry Winston, *Artificial Intelligence*. Addison-Wesley Publishing Company, 1992.
4. *SWI-Prolog 3.2.5 ReferenceManual*.
<http://www.swi.psy.uva.nl/projects/SWI-Prolog/Manual/Title.html>.

Course Goals:

To introduce the fundamental topics of AI, such as knowledge representation, state space search and planning. Emphasis will be on using AI techniques to solve problems. An AI language - Prolog will be used as a vehicle for implementing concepts of artificial intelligence.

Prerequisites by Topic:

Experience with some programming language and knowledge of basic data structures.

Major Topics Covered in the Course:

1. Introduction to AI.
2. Introduction to Prolog.
3. Intelligent Agents.
4. Problem Solving by Searching.
5. Knowledge-based Agents.
7. First-Order Logic.
8. Building a Knowledge Base.
9. Inference in First-Order Logic.
10. Frame Systems and Semantic Networks.
11. Planning.
12. Learning.
13. Philosophical Foundations.

Laboratory Projects:

1. Project using Prolog (1).
2. A significant term project is required (10).

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Estimate Curriculum Category Content (Semester hours)

Area	Core	Advanced	Area	Core	Advanced
Algorithms	2		Data Structures		
Software Design			Prog. Languages	1	
Comp. Arch.					

Oral and Written Communication:

Every student is required to submit one written report of typically 6-8 pages and to make one oral presentation of typically 20 minutes duration.

Social and Ethical Issues:

Philosophical and ethical issues related to building AI systems (1.5 hour discussion).
The students are graded on their understanding of these topics according to their participation in the discussion.

Theoretical Content:

1. Reasoning Methods - 3 hours.
2. Inference in First-Order Logic - 3 hours.
3. Logic of Action and Planning - 3 hours.
4. Inductive Learning - 3 hours.

Problem Analysis:

The analysis experiences in this course are related to evaluating the efficiency of the considered algorithms.