CS472 Foundations of Artificial Intelligence
Fall 2002

Where: OH 255

When: Mon, Wed, Fri 11:15–12:05

Professor: Bart Selman

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Office Hour: 4148 Upson; Fri 1:30pm – 2:30pm

Course Description:
This course introduces the theoretical and computational techniques that serve as a foundation for the study of artificial intelligence (AI). Topics to be covered include the following:

1. Introduction of AI and background: what is AI? History and foundations of AI. Related fields. AI from a rational agent perspective. Autonomous agents.
2. Problem solving by search: principles of search, uninformed ("blind") search, informed ("heuristic") search, game playing.
3. Logical knowledge representation and reasoning: knowledge bases, and inference.
4. Probabilistic knowledge representation and reasoning: review of probability theory, representing and handling uncertainty, probabilistic reasoning.
5. Learning: representation, estimation, inductive learning, statistical approaches, genetic algorithms, and neural networks.
6. Agents in the Real-World (as time permits):
   - Planning;
   - Natural language;
   - Vision and Speech;

Prerequisites: This course has no prerequisites other than a facility with programming (e.g., CS211 or CS212). An understanding of inference in first-order logic and basic blind search techniques (i.e., breadth-first and depth-first search) is also assumed, but background readings in these topics can be provided for those with a deficiency in this area.

Texts:

Required:
Artificial Intelligence: A Modern Approach; Russell and Norvig, Prentice-Hall, Inc.

Machines: The PC's in the Undergraduate PC Lab (317 Upson) are the primary computing resource for the class.

Course Requirements:

Homework: There will be approximately 6 homework assignments; at least 2 of these will be programming assignments (Java); the others will be problem sets (of a sort). **Assignments must be typewritten.** (Drawings, formulas, or calculations can be done by hand, if done so neatly.)

Students are encouraged to work on assignments in groups of up to size 3. Each student, however, is responsible for typing up his/her own solutions. The names of all collaborators should be identified on the first page of the homework. Choose groups at the beginning of the semester and stick with these groups through the midterm. At that point, there will be an opportunity to regroup.

All assignments are due at the beginning of class on the due date. Assignments handed in late will drop 20% for each period of 24 hours for which the project is late: after 5 days you will receive no credit.

Examinations: The course has one prelim/midterm and one final exam. The midterm is an in-class examination and the final will be given on the day and time slot scheduled by the university.

Project (for CS473 students only): The main assignment for CS473 is a course project. Students will work in groups (probably pairs) to design, build, and evaluate an intelligent system of their choice. Throughout the semester, project status reports and partial programs will be required. A separate "project" handout with details and due dates regarding the project proposal, status reports, and final project write-up will be made available from the course home page.

Tentative Grading Policy (CS472):		
	Assignments	50%
	Midterm Exam	15%
	Final Exam	30%
	Class participation	5%

On both exams, extra points will be allotted to study groups all of whose members achieve an "A-" or better. Similarly, "acceleration points" will be awarded to students making steady, upward progress throughout the semester.

Tentative Grading Policy (CS473):		
	Project Proposal and Presentation	20%
	Status Reports	10%
	Final Code, Write-up and Presentation	70%

Academic Integrity: The work you submit is expected to be **your own**. Collaboration is allowed as prescribed above, but you cannot copy all or part of another student's homework or program — regardless of whether that copy is on paper or on-line. Violation of the Academic Integrity Code very often results in *failure in the course*. **If there is any doubt as to what kind of collaboration is allowed, please ask the instructor.**