CIS 579 Artificial Intelligence - 3 credit hours

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Office Hours: 4:30-6 MW
Dearborn Discovery Core Category or Categories: Intersections
Course Meeting Times and Format(s): 6-9 MW, Lecture, Web, 1420 PEC
URL: http://www.engin.umd.umich.edu/CIS/course.des/cis479.html

Course Description:

This course is intended to provide an overview of the problems and methods studied in the field of artificial intelligence. The focus of the course will be on the study of methods of knowledge representation, data structures, and algorithms useful to the development of intelligent programs. The course will also include discussion of important applications of AI methodology.

Program Goals

- Our graduates will be successfully employed in a computer and information science-related field or another career path, in an industrial, commercial, academic, governmental, or non-governmental organization, or will be a successful graduate student in a program preparing them for such employment
- Our graduates will lead and participate in culturally diverse teams, becoming global collaborators and adapting to an ever changing field
- Our graduates will continue their professional development by obtaining continuing education credits, professional registration or certifications, or post-graduate study credits or degrees

Course Objectives

- Ability to describe architectures of machine learning systems or expert systems.
- Ability to describe common knowledge representation schemes.
- Ability to design state representations and heuristic functions to guide the automated solution of simple problems.
- Demonstrate an understanding of professional, ethical, legal, security and social issues and responsibilities associated with computer controlled systems.
- An ability to develop computer-based solutions to problems using artificial intelligence tools and techniques.

University Attendance Policy

A student is expected to attend every class and laboratory for which he or she has registered. Each instructor may make known to the student his or her policy with respect to absences in the course. It is the student's responsibility to be aware of this policy. The instructor makes the final decision to excuse or not to excuse an absence. An instructor is entitled to give a failing grade (E) for excessive absences or an Unofficial Drop (UE) for a student who stops attending class at some point during the semester.

Academic Integrity

The University of Michigan-Dearborn values academic honesty and integrity. Each student has a responsibility to understand, accept, and comply with the University's standards of academic conduct as set forth by the Code of Academic Conduct (http://www.umd.umich.edu/policies_st-rights/), as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses, and may be monitored using tools including but not limited to TurnItIn. Violations can result in penalties up to and including expulsion from the University. At the instructor's discretion, the penalty may be a grade of zero on the assignment up to and including recommending that the student be expelled from the University. It is the sole responsibility of the student to understand and follow academic guidelines regarding plagiarism. The University of Michigan–Dearborn has an online academic integrity tutorial that can be accessed at http://webapps.umd.umich.edu/aim.

Disability Statement

The University will make reasonable accommodations for persons with documented disabilities. Students need to register with Disability Resource Services (DRS) every semester they are enrolled for classes. DRS is located in Counseling & Support Services, 2157 UC. To be assured of having services when they are needed, students should register no later than the end of the add/drop deadline of each term. Visit the DRS website at: http://www.umd.umich.edu/cs_disability/. If you have a disability that necessitates an accommodation or adjustment to the academic requirements stated in this syllabus, you must register with DRS as described above and notify your professor. Upon receipt of your written notification, we will make accommodations as directed by DRS.

Safety [Faculty who teach online courses do not have to include this section.]

All students are strongly encouraged to register in the campus Emergency Alert System, used to communicate with the campus community during an emergency. More information on the system and how it works, along with enrollment information can be

found at: http://umemergencyalert.umd.umich.edu/ Please note that the system will only communicate through UM-Dearborn email accounts, so if you primarily use a non-university account you should forward your UM-Dearborn email to your primary account.

All students are also encouraged to program 911 and UM-Dearborn's Public Safety phone number (313) 593-5333 into personal cell phones. In case of emergency, first dial 911 and then if the situation allows call UM-Dearborn Public Safety.

Students are encouraged to identify two ways out of the building as well as to locate the building's designated assembly area where students are expected to go in the event of an evacuation: http://www.umd.umich.edu/fileadmin/env-health-safety/public/files/Site_Assm_Areas_2011.pdf. For those students requiring assistance in an evacuation, please visit the following site to identify the nearest "Area of Rescue Assistance": http://www.umd.umich.edu/fileadmin/env-health-safety/public/files/Handicap_Accessible_Locations.pdf Please also familiarize yourself with the locations in this building identified as shelter areas in the event of severe weather. Specific shelter locations for severe weather incidents can be located at: http://www.umd.umich.edu/691921/

In the case of an active shooter we will shelter in place. If this becomes a necessity please:

- Contact 911 immediately to report an emergency.
- Find a safe area such as small rooms, under furniture, or other safe areas.
- Lock or block doors in rooms where you and others are located.
- For interior rooms, close blinds, shut off lights. Rooms facing outside - have blinds open!
- Get down—preferably under tables, furniture or equipment. Stay away from the door.
- Remain silent (silence all personal communication devices) and stay in place.
- If you are grouped in an area with other people, quietly select a leader.
- The leader should call 911 to report information such as number of people and location.
- Attempt to maintain a calm quiet atmosphere.
- Stay sheltered until you receive an "all clear" message from law enforcement.
- Follow law enforcement direction.

Required Materials and/or Technology:

REQUIRED: Artificial Intelligence (6th Edition) by G. Luger,Addison-Wesley, 2009.

REQUIRED: Lisp (3rd Edition) by P. Winston and B. Horn, Addison-Wesley, 1989.

RECOMMENDED: AI Algorithms, Data Structures and Idioms by Luger and Stubblefield, Addison-Wesley, 2009 (Recommended).

TECHNOLOGY: SOAR, Lisp, C++, various public domain AI tools,

Assignment and Grading Distribution:

1 Term Project	(50 points)	30%
3 Project Assignments	(25 points each)	60%
1 Oral Presentation	(20 points)	10%

Grading Scale:

96%- 100%	A+	77%-79%	C+
92%- 95%	A	74%-76%	C
90%- 91%	A-	70%-73%	C-
87%- 89%	B+	67%-69%	D+
84%- 86%	B	64%-66%	D
80%- 83%	B-	60%-63%	D-

Course Outline:

Date	Activity and Content
May 4	Lisp: Primitives, Predicates, and Conditionals L1, W1-W4,LS11
May 6	Lisp: Iteration, I/O, Recursion, Data Structures, and Macros W5-W12, W17
May 11	Intelligent Search L3-L4, W19, LS12-LS14
May 13	Turn-based Computer Game Opponents L4,L6 Project 1 Pattern Matching
May 18	Production Systems L6, L8, W24-W27 Expert Systems and Liability
May 20	Uncertainty and Probabilistic Reasoning L5, L9 Quantifying Belief Systems
May 25	Memorial Day Holiday
May 27	**No class – 6:00 to 7:30 CIS 479 Exam**

May 27	Knowledge Acquisition and Truth Maintenance LS17
June 1	Predicate Logic (unification and resolution) L2, L14, LS15-LS16 Project 2 Heuristic Problem Solving
June 3	Knowledge Representation L7, LS18
June 8	Planning and Intelligent Agents L7, L13-L14
June 10	Learning Machine and Human L10, L13, LS19
June 15	Neural Networks and Genetic Algorithms L11, L12 Project 3 Knowledge Engineering
June 17	Reactive Game AI Notes Natural Language Processing L15
June 22	**No class – 6:00 to 7:30 CIS 479 Exam**
June 22	Oral Presentation Term Project
June 24	Oral Presentation Term Project