

University of Michigan-Dearborn Syllabus



CIS 479 Artificial Intelligence - 3 credit hours

Semester and Year: Summer I 2017

Prof. Bruce R. Maxim

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Office Hours: 4:00-6:00 MW, 2:00-4:00 TTh, by appt. F

Dearborn Discovery Core Category or Categories:

Intersections

Course Meeting Times and Format(s): 6:00-8:40 MW, Lecture, Web, 1410 PEC

URL: <http://www-personal.umd.umich.edu/~bmaxim/>
<http://groups.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

a. outcomes of instruction

- 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.

b. Intersections

- Students are able to describe how ways of knowing and creating knowledge differ across disciplines and cultures.
- Students are able to demonstrate knowledge, skills, and attributes needed to understand diverse local or global contexts.
- Students are able to critically evaluate the narratives, values, artifacts, processes, technologies, or structures that may create a just and sustainable society.
- Students are able to creatively integrate theory and practice from across disciplines or from experiences outside of the classroom to address complex questions.

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:

2 Exams	(50 points each)	45%
4 Project Assignments	(25 points each)	50%
1 Oral Presentation	(20 points)	5%

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	Reading
May 8	Lisp: Primitives, Predicates, and Conditionals	L1, W1-W4,LS11
May 10	Lisp: Iteration, I/O, Recursion, Data Structures, Macros	W5-W12, W17
May 15	Intelligent Search	L3-L4, W19, LS12-LS14
May 17	Turn-based Computer Game Opponents Project 1 Pattern Matching	L4,L6
May 22	Production Systems Expert Systems and Liability	L6, L8, W24-W27
May 24	Uncertainty and Probabilistic Reasoning Quantifying Belief Systems	L5, L9
May 24	Exam 1	
May 29	Memorial Day Holiday - no class	
May 31	Knowledge Acquisition and Truth Maintenance	LS17
June 5	Predicate Logic and Knowledge Representation Project 2 Heuristic Problem Solving	L2, L7, L14, LS15-LS16, LS18
June 7	Planning and Intelligent Agents	L7, L13-L14
June 12	Learning Machine and Human	L10, L13, LS19
June 14	Neural Networks and Genetic Algorithms	L11, L12
June 19	Reactive Game AI Project 3 Knowledge Engineering	Notes
June 21	Oral Presentation on AI and Social Responsibility Natural Language Processing	L15
June 26	Project 4 Soar Agent Experiment	
June 26	Exam 2	

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 Policy:

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://umdearborn.edu/697817/>), as well as policies established by each college. Cheating, collusion, misconduct, fabrication, and plagiarism are considered serious offenses and violations can result in penalties up to and including expulsion from the University

Disability Statement:

The University will make reasonable accommodations for persons with documented disabilities. Students need to register with Counseling & Disability Services (DS) every semester they are enrolled. DS is located in 2157 UC (http://www.umd.umich.edu/cs_disability/). 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. If you have a disability that necessitates an accommodation or adjustment to the academic requirements stated in this syllabus, you must register with DS as described above and notify your professor.

Safety:

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

The Emergency Alert Notification (EAN) system is the official process for notifying the campus community for emergency events. All students are strongly encouraged to register in the campus EAN, for communications during an emergency. The following link includes information on registering as well as safety and emergency procedures information: <http://umdearborn.edu/emergencyalert/>.

If you hear a fire alarm, class will be immediately suspended, and you must evacuate the building by using the nearest exit. Please proceed outdoors to the assembly area and away from the building. Do not use elevators. It is highly recommended that you do not head to your vehicle or leave campus since it is necessary to account for all persons and to ensure that first responders can access the campus.

If the class is notified of a shelter-in-place requirement for a tornado warning or severe weather warning, your instructor will suspend class and shelter the class in the lowest level of this building away from windows and doors.

If notified of an active threat (shooter) you will Run (get out), Hide (find a safe place to stay) or Fight (with anything available). Your response will be dictated by the specific circumstances of the encounter.