

**Syllabus for CSC-446/546**  
**Fall 2005**  
**Artificial Intelligence**

**Instructor Information:**

- Dr. Michael Farmer
- Office Hours: Tuesday 1-4
- Office: 214 MSB
- Phone: (810) 762-3423
- Email: farmerme@umflint.edu

**Course Information:**

- Artificial Intelligence (AI) is arguably one of the most exciting research areas in computer science. Its oft-heralded goal of developing machines that think like humans has stimulated the imagination for decades and has been a popular topic of much popular fiction and movies. This class is a combined undergraduate and graduate course which will introduce you to the broad spectrum of technologies that comprise AI.

**Course Objectives:**

- The objective of this class is to introduce you to a sampling of the technologies that have been loosely grouped together and called Artificial Intelligence. The field of AI is one of the most active research fields in computer science, covering a broad range of topics and methodologies. This class will present a number of the more dominant technologies and their related applications. One desired outcome of this class is for you to understand these technologies and to know when and how to apply them to your own unique applications. You will be able to understand the underlying technologies and apply them through programming to address real-world problems.

**Class Format:**

- This class is going to be following a new format to better support the students in the graduate program. The class meets face-to-face every other week. During that meeting there will be traditional lectures with slide material made available. During the alternate weeks where we do not meet, I will have the slide materials posted on Blackboard and will have supplemental text supporting each slide provided as well.
- There will be a combination of analytical and programming assignments due on a regular basis. The analytical assignments (i.e. textbook problems) will be due every week. The programming assignments will be due every other week.
- The midterm exam will be a take-home exam to allow us the best use of our limited number of class meetings.
- To support the combined undergraduate/graduate audience, the class is organized around a core set of materials and assignments. For the graduate students, there

will be additional reading assignments (text and paper), as well as additional homework problems each week, and lengthier programming assignments.

**Prerequisites:**

- CSC-375

**Book:**

- *Artificial Intelligence: Structures and Strategies for Complex Problem Solving, 5/e*, by George Luger.

**Other Good Reference Books:**

- *Artificial Intelligence: An Agents Approach 2/e*, by Russell & Norvig
- *Artificial Intelligence: A Modern Synthesis*, by Nilsson

**Tools:**

- *Any development environment for MATLAB, C, C++, Java, Lisp or Prolog*

**Grading:**

- Homework (20%), Mid-term (25%), Project (25%), Final (30%)
- Class participation is an expected portion of the course work
- Scale:

<b>A's</b>	<b>B's</b>	<b>C's</b>	<b>D's</b>
97-100: A+	87-89: B+	75-79: C+	65-69.9: D+
92-96.9: A	82-86.9: B	72-74.9: C	62-64.9: D
90-91.9: A-	80-81.9: B-	70-71.9: C-	60-61.9: D-
			0-59: E

**Attendance:**

- Regular class attendance is essential. We will be working through examples and an ongoing case study to understand how to use the methods and tools.

**Late Homework Policy:**

- Having worked for 20 years to schedules devised by others, I know things happen that sometimes prevent on-time delivery. Please plan on turning them in by the Friday after they were due at the latest.

**Academic Misconduct:**

- Copying others work, plagiarizing external references without giving due credit, and cheating in exams are strictly forbidden. Please take pride in your own work, and feel free to ask me if you need help or assistance to maximize your learning.

**Proposed Schedule: (Note this schedule is subject to change)**

<b>Week</b>	<b>Tuesday</b>
Week 0 (8/29)	Classes start on Wednesday (no class)
Week 1 (9/5)	<i>Out-of-class:</i> Overview & Introduction (Ch. 1 + pp. 35-44 + Turing Paper + Searle Paper)
Week 2 (9/12)	In-class: Predicate Calculus (Ch 2)
Week 3 (9/19)	<i>Out-of-class:</i> Search Basics (Ch 3: 3.0, 3.1, and 3.2 )
Week 4 (9/26)	In-class: Heuristic Search (Ch 4: 4.0, 4.1, 4.2, 4.3) )
Week 5 (10/3)	<i>Out-of-class:</i> Heuristic Search II (4.3 + 4.4 + paper on minimax) and Basics of Stochastic Methods (Ch 5)
Week 6 (10/10)	In-class: Knowledge Representation I(Ch 7: 7.0, 7.1, and 7.2) <b>Mid-term Take-home Exam Distributed</b>
Week 7 (10/17)	<i>Out-of-class:</i> Knowledge Representation II (7.3, 7.4 & Brookes Papers) <b>Mid-term Exam Due</b>
Week 8 (10/24)	In-class: Strong Methods (Ch 8: 8.0, 8.1, 8.2, and 8.3)
Week 9 (10/31)	<i>Out-of-class:</i> Strong Methods II (Ch 8.4) & Reasoning Under Uncertainty I (Ch 9.0 and 9.1: 9.1.1, 9.1.2, and 9.1.3)
Week 10 (11/7)	In-class: Reasoning Under Uncertainty II (Ch 9.2.2, 9.2.3, and 9.3.1-9.3.3 + papers on Fuzzy Logic, Dempster-Shafer and Bayesian Networks)
Week 11 (11/14)	<i>Out-of-class:</i> Symbol-based learning(Ch 10.0, 10.1, 10.2: 10.2.1 and 10.2.2, and 10.3)
Week 12 (11/21)	In-class: Statistical Learning (paper on Statistical Pattern Recognition and paper on Classifier Comparison)
Week 13 (11/28)	<i>Out-of-class:</i> Connectionist learning (Neural Networks) Ch 11.1 and 11.2
Week 14 (12/5)	In-class: Social Learning (Ch 12.0 and 12.1 and paper on Genetic Algorithms)
Week 15 (12/12)	<i>Out-of-class:</i> Complete Projects