Instructor: Dr. Megan Olsen
Office: DS 124
Phone: 410-617-2852
Email: mmolsen@loyola.edu (note the 2 m’s)

Class: MWF 11:00-11:50PM, KH006

Office Hours: 3-5PM Monday, 4-6PM Wednesday, 1-4PM Thursday, and other times by appointment

** There are significant changes between this book and the previous edition, as they don’t frequently release new editions; be sure to get the 3rd edition. This is a classic textbook that would be worth keeping to reference later.

Course Website: http://moodle.loyola.edu

Course Description: An introduction to basic concepts and techniques of artificial intelligence. Topics include search, logic for knowledge representation and deduction, and machine learning. Some current application areas such as natural language, vision, and robotics are surveyed.

Prerequisites: CS301

Course Objectives:
After completing this course, students should be able to understand and use the following:
• the role of artificial intelligence in current computing
• AI search algorithms, including the problems they solve and their pros/cons
• solutions to planning problems
• reasoning under uncertainty
• unsupervised machine learning techniques
• supervised machine learning techniques

Extra Resources:
• AITopics: http://aitopics.org/
• Python tutorials: http://docs.python.org/2/tutorial/ (more than you want to know), http://www.learnpython.org/ (free interactive, we’ll use in class)
• Python online book: http://learnpythonthehardway.org/book/

Learning Disabilities:
To request academic accommodations due to a disability, please contact the Disability Support Services Office at (410) 617-2062. The office now sends letters for accommodation to professors via email; if you have had such a letter sent to me, please schedule a time for us to discuss the accommodations that you might need in this class.
**Topic Schedule**
This schedule is subject to change. The final schedule will be on Moodle each week. Use this as a reference for the general ordering of topics & what will be covered in the course.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
</tr>
</thead>
<tbody>
<tr>
<td>1*</td>
<td>What is AI?</td>
<td>Ch. 1</td>
</tr>
<tr>
<td>2</td>
<td>Introduction to Python, Intelligent Agents</td>
<td>Ch. 2</td>
</tr>
<tr>
<td>3</td>
<td>General Search &amp; Uninformed Search</td>
<td>3.1-3.4</td>
</tr>
<tr>
<td>4</td>
<td>Informed (heuristic) search, Local search</td>
<td>3.5-3.6, 4.1</td>
</tr>
<tr>
<td>5</td>
<td>Adversarial search</td>
<td>5.1-5.6</td>
</tr>
<tr>
<td>6</td>
<td>Constraint satisfaction</td>
<td>6.1-6.2, 6.4 (6.5?)</td>
</tr>
<tr>
<td>7*</td>
<td>Logic, Midterm Exam, Happy Holiday!</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Planning</td>
<td>Ch. 10</td>
</tr>
<tr>
<td>9</td>
<td>Uncertainty</td>
<td>Ch. 13, 14</td>
</tr>
<tr>
<td>10</td>
<td>Learning Probabilistic Models</td>
<td>Ch. 20</td>
</tr>
<tr>
<td>11</td>
<td>Learning through Examples</td>
<td>Ch. 18</td>
</tr>
<tr>
<td>12</td>
<td>Learning through Examples</td>
<td>Ch. 18</td>
</tr>
<tr>
<td>13*</td>
<td>Learning through Examples, Happy Thanksgiving!</td>
<td>Ch. 18</td>
</tr>
<tr>
<td>14</td>
<td>Ethics in AI &amp; the Future of AI</td>
<td>Ch. 26 &amp; 27</td>
</tr>
<tr>
<td>15*</td>
<td>Exam Review</td>
<td></td>
</tr>
</tbody>
</table>

* denotes a shortened week

The first half of the semester is focused on AI search, which is used to solve many different types of problems in AI. The second half of the semester will focus on machine learning, which is one of the hot topics in AI and computer science in general.

**Grading:**
- Preparation: 10%
- AI in the News: 2%
- Homework & Projects: 58%
- Final Project & Presentation: 5%
- Midterm exam: 10%
- Final Exam (cumulative): 15%

**Final Grade Distribution:**
Final letter grades will be no harder to achieve than the following:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93%</td>
</tr>
<tr>
<td>A-</td>
<td>90%</td>
</tr>
<tr>
<td>B+</td>
<td>87%</td>
</tr>
<tr>
<td>B</td>
<td>83%</td>
</tr>
<tr>
<td>B-</td>
<td>80%</td>
</tr>
<tr>
<td>C+</td>
<td>77%</td>
</tr>
<tr>
<td>C</td>
<td>73%</td>
</tr>
<tr>
<td>C-</td>
<td>70%</td>
</tr>
<tr>
<td>D+</td>
<td>67%</td>
</tr>
<tr>
<td>D</td>
<td>60%</td>
</tr>
</tbody>
</table>
Course Procedures

1. Keeping up with the course
Your success in this course is my number one priority. Should you need extra help, please come visit me in my office, post a question on Piazza, or send me email (only if it’s something you can’t put on Piazza).

Piazza will be used to make announcements. Moodle will be used to post course materials and schedule updates. All electronic assignment submissions should be done on Moodle. Be sure to check both regularly.

2. Attendance
Class meetings will involve a mix of discussions, collaborative activities, and lecture. You are expected to be present and on time to each class meeting. If you know in advance that you will be absent for any reason, please notify me in writing in advance.

Our discussions benefit from your contributions. If you do miss a class, you must first talk to a classmate about any material that you may have missed and check Moodle for assignments. After that, you may follow up with the instructor about any further questions or concerns.

3. Class Preparation
I expect you to come prepared to each class meeting. Each class will have an assigned preparation – working through a few problems, reading from the book, looking at a website, etc. This preparation ensures everyone is on the same page for class, as necessary background material has been reviewed.

Sometimes you will have a graded assignment to ensure that you’ve done the required preparation. These will vary, but may include short writing assignments in or out of class, mini quizzes, or questions. If it is to be completed before class it will be explicit in the preparation description.

You should check Moodle for updates and read/watch any material that has been assigned before coming to class. Reading a textbook should entail the following:

1. **Overview**: Try to understand the overall organization of the material to be covered by skimming through the reading and looking at subject headings & topics.
2. **In-Depth**: Next, read the material closely. Try to understand the techniques, approaches, and definitions provided. It is OK if there are a few things you don’t completely understand, but you should feel comfortable with most of the material. Taking notes or highlighting the book is a good idea.
3. **Final Notes**: After carefully reading the material, mentally review what you just learned; what do you think are the most important concepts being covered, and what questions do you have?

4. Assignments
There will be a midterm exam and a final exam in this course. The exams give you a chance to show what you have learned on the theory of AI; the focus will be on algorithms, not coding. The final exam is cumulative.

We will have approximately 1 homework per week, as well as numerous projects. The homeworks will generally ask you to work through problems on paper, to understand the concepts. The projects will require you to program the algorithms we’ve learned, or apply a machine learning technique, to solve a larger problem than those in the homework.

Many assignments will be submitted electronically. Assignments submitted on paper must be legible.
5. Late Work
For every 8 hours late I will deduct 5% from your final earned grade on that assignment (so, 11 hours late will be -10%); this includes hours over the weekend. This is the equivalent of 15% a day, but allows you to save some off that if you really only need a few more hours.

If you wish to turn it in after hours or when I am not on campus, you must submit it to me electronically. Typing assignments will make this easy to accomplish. You may ONLY submit an assignment via e-mail if it was meant to be turned in on paper during class; otherwise, submit it via the stated electronic method (edX or Moodle).

Of course, sometimes things happen. If you have an excused reason for needing more time (sickness, death of a relative, etc) come talk to me BEFORE the day the assignment is due and we can discuss your options.

Everyone will also have ONE late pass. This will allow you to choose to turn in any homework or project one class meeting day later without penalty (so if it was due on Monday, you can turn it in Wednesday, for instance).

6. Academic Integrity
Loyola University Honor Code Statement:
"The Honor Code states that all students of the Loyola Community have been equally entrusted by their peers to conduct themselves honestly on all academic assignments. The Students of this University understand that having collective and individual responsibility for the ethical welfare of their peers exemplifies a commitment to the community. Students who submit materials that are the products of their own minds demonstrate respect for themselves and the community in which they study. All outside resources or information should be clearly acknowledged. If there is any doubt or question regarding the use and documentation of outside sources for academic assignments, your instructor should be consulted. Any violations of the Honor Code will be handled by the Honor Council."

The Honor Code as it pertains to this class:
In general, any copying of an assignment, whether electronically or by hand is considered plagiarism. Such students may be referred to the Honor Council for disciplinary action. At the very least, two or more students presenting assignments identical in all important aspects will share the points from a single grade.

- Preparation: You are welcome to discuss the reading or assignment with other students. However, you must formulate any answer to questions/quizzes/writing on your own.
- Homework: Should be done individually. Feel free to talk to other students and use Piazza for clarifications or help understanding course material, but your solution to the problems must be worked out on your own.
- Projects: Depending on the project they may be worked on in groups or individually. All work submitted for the project should be the work of only those students whose name(s) appears on it.
- Exams: Work on exams should be solely the work of the student whose name appears at the beginning of the exam.

All tests will include the following statement with the signature(s) of the student(s) who worked on the assignment, and by submitting any assignment the student is agreeing with this statement: "I understand and will uphold the ideals of academic honesty as stated in the Honor Code."