CmSc 310 A  Artificial Intelligence
Spring Semester, 2012

Instructor: Lydia Sinapova  (lydia.sinapova@simpson.edu)

Course Description

CmSc 310 is an introduction to the relatively young and very exciting scientific discipline Artificial Intelligence. It discusses the specifics of the AI problems and the basic methods to solve them. The course focuses on knowledge representation and search strategies, and their application in game programming and expert systems. Some approaches to machine reasoning, planning and learning will be discussed too.

Recommended Text


Course Objectives

Upon successful completion of this course you will:

- Become familiar with the two fundamental AI problem-solving methods: knowledge representation and state space search strategies.
- Become familiar with the basic approaches to expert systems' design and implementation
- Become familiar with the basic approaches to reasoning, planning, and machine learning.

Topics

1. Intelligent agents
2. Knowledge representation
3. Search
4. Game Playing
5. Expert systems
6. Planning
7. Machine learning
8. Neural networks
9. Probabilistic reasoning
10. Artificial life

Course Work and Learning Resources

- **Readings**

The core learning resources are the lecture notes posted on the class web page. Most of them are based on *Artificial Intelligence: A Modern Approach (Third Edition)* by Russell & Norvig. This text is very difficult but thorough and state-of-the-art. Additional resources include papers and seminal articles.
- **Homework assignments**

Homework assignments include problem-solving and programming tasks. AI tasks, by their nature, have ill-defined goals. Do not be surprised when the problems that we are going to discuss, including homework assignments, are not as well specified as you are used to.

**Naming conventions:** You have to name your files (Word documents, programs, projects) with your first name, followed by the course number and the assignment number, e.g. *John_cmsc310_HW01.doc*

You are encouraged to turn in draft assignments for feedback, provided that the drafts are sent at least 48 hours earlier than the due time.

**Policy on late assignments:** Late assignments will be accepted if sent within 48 hours after the deadline with 10% reduction in grade. You have the option of turning two late assignments without penalty.

- **Research paper**

The research paper will focus on problems and issues and in Artificial Intelligence, not covered in class. **You will be required to report bi-weekly your progress on the paper.** At the end of the course you will present your paper in class. Details about the research paper will be posted on the class web page.

- **Exams**

There will be two unit exams.

**Grading Policies**

Your grade will be determined by the following:

<table>
<thead>
<tr>
<th></th>
<th>Research paper</th>
<th>Homework assignments</th>
<th>Exams</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>25%</td>
<td>40%</td>
<td>35%</td>
</tr>
</tbody>
</table>

Grades follow a normal distribution as shown in the following table where the percentage is the lowest percentage allowed to obtain that grade.

<table>
<thead>
<tr>
<th>Grade</th>
<th>B +</th>
<th>B</th>
<th>C +</th>
<th>C</th>
<th>D +</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93.0%</td>
<td>83.0%</td>
<td>73.0%</td>
<td>63.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A -</td>
<td>90.0%</td>
<td>80.0%</td>
<td>70.0%</td>
<td>60.0%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Study Time**

This is a four credit course that meets 3 days per week for 50 minutes. It is designed to have learning opportunities and activities totaling approximately 160 hours over the 15 weeks of the course (including finals week). The designed activities may take each student a different amount of time to finish, however the average will be 160 hours. You have to plan for an average of 10 hours per week out-of-class study time. Further estimates include:
<table>
<thead>
<tr>
<th>Activity</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>In-class activities</td>
<td>39</td>
</tr>
<tr>
<td>Required reading and studying (12 weeks x 3 hours each)</td>
<td>36</td>
</tr>
<tr>
<td>Homework assignments (10 x 6 hours each)</td>
<td>60</td>
</tr>
<tr>
<td>Research paper</td>
<td>30</td>
</tr>
<tr>
<td>Preparation for exams</td>
<td>20</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>185</strong></td>
</tr>
</tbody>
</table>

**Instructional Help**

I will be available for any type of questions and consultations during and outside my office hours. In order to avoid conflicts with other scheduled appointments, please let me know in advance (by e-mail or by phone) that you want to see me. You are encouraged also to send questions by e-mail.

**Attendance**

Many aspects of the topics to be discussed in class will seem unfamiliar to you and attendance is important for sound understanding and learning. Let me know if you are going to be absent and I will send you all handouts and other materials given in class. I will also provide any necessary help so that your absence does not affect negatively the learning process.

**Academic Integrity**

In all endeavors, Simpson College expects its students to adhere to the strictest standards of honesty and integrity. In keeping with the College’s mission to develop the student’s critical intellectual skills, while fostering personal integrity and moral responsibility, each student is expected to abide by the Simpson College rules for academic integrity. Academic dishonesty includes (but is not limited to) any form of cheating, plagiarism, unauthorized collaboration, misreporting any absence as college-sponsored or college-sanctioned, submitting a paper written in whole or in part by someone else, or submitting a paper that was previously submitted in whole or in substantial part for another class without prior permission. If the student has any questions about whether any action would constitute academic dishonesty, it is imperative that he or she consult the instructor before taking the action. **All cases of substantiated academic dishonesty will be reported to the student’s academic advisor and the Dean for Academic Affairs.** For further guidance on these rules and their sanctions, please see the college catalog.

**Inclement Weather**

If classes are canceled due to inclement weather, I will send you an e-mail with instructions how to proceed with the material scheduled for the canceled class meeting.

**Continuity Plan**

Should the normal instructional activity on the campus be interrupted or shortened by a campus-wide closing, students will receive information from the instructor or other representative of the college about when and if the course might be continued or completed via Internet, telephone, or United States mail.

**Miscellaneous**: Any issues not discussed above will be solved on a case by case basis.