Course Syllabus – CSC 412 – Introduction to Artificial Intelligence

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Office Hours: 11:00-12:00 (MW) + 1:00-3:00 (TTh) + by appointment

Status within the Curriculum
Elective

2018-2019 Catalog Description
Concepts and techniques of intelligent systems; survey of research literature.

Course Prerequisite(s)
1. CSC 307 -- Data Structures and Algorithm Analysis: Required
2. CSC 300 (or equivalent): Preferred

Textbook(s) and/or Other Required Material
Additional course materials may be posted on the class website (URL is case-sensitive): http://www.cs.usm.edu/~banerjee/CSC412
Various notifications and assignments will also be posted on this webpage, so be sure to check this URL often.

Attendance
You should do your best to attend every class. Knowledge presented in class will be critical for passing the midterm and the final. In addition, pop quizzes (at the very beginning of a class) based on recently covered material are always a possibility. If you are late for a class, you may miss a quiz, unless prior arrangements are made with the instructor.

Email Policy
If you send me any email, you must include your full name in the email, and mention “CSC 412/512” on the subject line. I may not respond to your email if you fail to do so.

Behavior in Class
You are NOT allowed to use any electronic devices in class, without permission. You must NOT leave while the class is in session without permission. If you have anything to say, it must be addressed to the instructor; you must NOT talk amongst yourselves. Any violation will automatically earn a fail-grade.

This policy is not meant to discourage questions about the class materials. You should ask as many questions about the material as you need to.

Assignments and Workload
There will be a few assignments, 2 programming projects, and a group presentation, in addition to a midterm, a final, and possibly pop quizzes. The workload will be targeted to roughly 6 to 8 hours per week (on the average) outside of class. Assignments must be submitted on A4-sized paper (no emails)
and must be stapled. Use an electronic word processor if you can, and submit in print. Hand-written assignments must be clear and legible. Start to work on assignments as soon as deadlines are posted; if you report issues/problems just before a deadline, it will not be sufficient to earn an extension.

**Grading**

<table>
<thead>
<tr>
<th>Percentage</th>
<th>Component</th>
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<tbody>
<tr>
<td>30%</td>
<td>Assignments/Quizzes</td>
</tr>
<tr>
<td>20%</td>
<td>Programming Projects</td>
</tr>
<tr>
<td>10%</td>
<td>Presentation</td>
</tr>
<tr>
<td>20%</td>
<td>Midterm</td>
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<tr>
<td>20%</td>
<td>Final</td>
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Late homeworks/projects will be penalized by 20% per calendar day, except for extreme circumstances. If possible, give the instructor advance notice of any problems.

Extra credit may be offered periodically, so take advantage of it when it arises. There will not be extra credit (or makeup assignments) available toward the end of the course, so plan accordingly. In order to get a good distribution of grades, it might be necessary to apply a scale or curve.

**Disability Accommodations**

If a student has a disability that qualifies under the Americans with Disabilities Act (ADA) and requires accommodations, he/she should contact the Office for Disability Accommodations (ODA) for information on appropriate policies and procedures. Disabilities covered by ADA may include learning, psychiatric, physical disabilities, or chronic health disorders. Students can contact ODA if they are not certain whether a medical condition/disability qualifies.

**Address:**

The University of Southern Mississippi  
Office for Disability Accommodations  
118 College Drive # 8586  
Hattiesburg, MS 39406-0001

**Voice Telephone:** 601.266.5024 or 228.214.3232  
**Fax:** 601.266.6035  
Individuals with hearing impairments can contact ODA using the Mississippi Relay Service at 1.800.582.2233 (TTY) or emailing ODA at oda@usm.edu.

**Academic Integrity**

Students are encouraged to collaborate in preparing for tests or quizzes, and even for homeworks or assignments. However, the final work submitted must be the student's own work. Whenever you collaborate for an assignment or a programming project, you must declare the names of all collaborators in the team, and the percentage effort of every team member including yourself. No collaboration will be allowed during quizzes or tests.

All students at the University of Southern Mississippi are expected to demonstrate the highest levels of academic integrity in all that they do. Forms of academic dishonesty include (but are not limited to):

1. Cheating (including copying from others’ work). *Blind use of online solution manual falls in this category, and will be prosecuted severely.*
2. Plagiarism (representing another person’s words or ideas as your own; failure to properly cite the source of your information, argument, or concepts).
3. Falsification of documents
4. Disclosure of test or other assignment content to another student
5. Submission of the same paper or other assignment to more than one class without the explicit approval of all faculty members’ involved
6. Unauthorized / undeclared academic collaboration with others
7. Conspiracy to engage in academic misconduct

Engaging in any of these behaviors or supporting others who do so will result in academic penalties and/or other sanctions. If I determine that a student has violated our Academic Integrity Policy, the first occurrence will be sanctioned with 0 credit for the entirety of that work, and the second occurrence will result in a grade of “XF” for the course, which will be on the student’s transcript with the notation “Failure due to academic misconduct.”

For more details, please see the University’s Academic Integrity Policy (https://www.usm.edu/institutional-policies/policy-acaf-pro-012%20). Also check out the website: https://www.usm.edu/provost/students-guide-academic-integrity. Note that repeated acts of academic misconduct will lead to expulsion from the University.

Course Topics (tentative)

<table>
<thead>
<tr>
<th>1. Foundations of AI</th>
<th>History of AI, perspectives – philosophical, mathematical, psychological, thinking vs. acting, humanly vs. rationally, knowledge of the Turing test and “Chinese Room”.</th>
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<tbody>
<tr>
<td>2. Search and constraint satisfaction</td>
<td>Formulation of problem spaces, knowledge of brute-force search methods (breadth-first, depth-first, iterative deepening), informed search methods (best first, A*), heuristics and admissibility, formulation and solution of constraint satisfaction problems, experience with adversarial search (minimax and alpha-beta pruning)</td>
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<tr>
<td>3. Knowledge representation and reasoning</td>
<td>Logical agents, propositional and first order logic, inference in first order logic (forward and backward chaining, resolution, theorem proving), non-monotonic inference, knowledge representation</td>
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<td>4. Reasoning under uncertainty</td>
<td>Probabilistic reasoning, understanding of Bayesian networks and complexity of inference, temporal reasoning (smoothing, filtering and prediction), knowledge and experience with Hidden Markov Models</td>
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<td>5. Planning</td>
<td>Definition and examples of planning systems, formulation of planning as search, understanding of forward and backward search, knowledge of partial order planning</td>
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<td>6. Research literature</td>
<td>Research and present a topic not covered in class</td>
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