CSC 520 Course Syllabus

CSC 520 Introduction to Artificial Intelligence
Section 001 - Spring 2017 - 3 Credit Hours
Tuesdays & Thursdays 11:45am - 1pm EBII Room 1230.

Overview

This course is designed to provide a graduate-level introduction to Artificial Intelligence including basic concepts. Course learning outcomes include:

- Identifying representations and methodologies useful in the development of computer-based systems which exhibit aspects of intelligent behavior;
- Programming simple intelligent agents to operate in simple environments;
- Identifying the utility and limitations of knowledge representation methodologies such as propositional and predicate logic, rule-based systems, and probabilistic systems;
- Identifying the utility and limitations of companion reasoning methods, including resolution, rule processing, probabilistic reasoning, machine learning, and natural language processing;
- Distinguishing various uninformed and informed search algorithms and identify when each is appropriate;
- Designing and implementing a series of simple intelligent agents of increasing complexity.

Prerequisites

CSC 316 (Data Structures) and CSC 226 (Discrete Math) or the equivalent undergraduate background. Undergraduate exposure to some symbolic logic and some probability are also a good idea.

Required Textbook

Stuart J. Russell and Peter Norvig, **Artificial Intelligence: A Modern Approach, 3rd Ed.** Prentice Hall Press, 2010, ISBN 0-13-604259-7, ($\approx$ \$99.97 and up new cheaper used).
(*Only the 3rd Edition will do, Blue, not Green, not Red*).

Course Webpages

Relevant course notes will be posted on the web and linked to from the course website. Any modern browser should be able to decode the symbols used.

Tentative List of Topics

A tentative list of topics that will be covered is as follows:

- Agents and Environments; Case Study: Watson
- State Space Representation and Search Algorithms
- Informed and Uninformed Search

- Game Tree Search
- Representation and Reasoning Systems
- Propositional Logic
- First-Order Predicate Logic
- Logic Programming and Prolog
- Planning: Situation Calculus, STRIPS, PADDL, & Planning Graphs
- Graph Matching & Knowledge Representation
- Semantic Networks and Inheritance-Based Hierarchies
- Uncertainty and Approximate Reasoning
- Probabilistic Reasoning & Decision Support
- Machine Learning
- Natural Language Processing

Grading

Grades will be based on homework assignments including but not limited to programs, two midterm tests, and final exam. *All homework is due at the same time on the same day, whether you are a local or remote student.* Your weighted average numerical score to three decimal places will be determined by the following weights:

Work	Total
Homework Assignments	20%
Class Participation (In-Class), Piazza Participation, & Online Miniquizzes (all)	5%
Midterm Exam 1	20%
Midterm Exam 2	20%
Final Exam	35%

Final letter grades will be assigned using the following scale where X is your overall weighted average, rounded to three decimal places.

Range	Letter Grade
$.980 \leq X \leq 1.000$	A+
$.920 \leq X < .980$	A
$.900 \leq X < .920$	A-
$.880 \leq X < .900$	B+
$.820 \leq X < .880$	B
$.800 \leq X < .820$	B-
$.780 \leq X < .800$	C+
$.720 \leq X < .780$	C
$.700 \leq X < .720$	C-
$.680 \leq X < .700$	D+
$.620 \leq X < .680$	D
$.600 \leq X < .620$	D-
$X < .600$	F

Instructors do not give grades; you *earn* your grade. Check your entry in the gradebook regularly. Any challenge to a grade you receive on any item must be made via email to the TAs ccing the instructor *within one week* of the grade being entered into the gradebook. Save all your work in this course until the end of the semester. Do not ask Dr. Lynch or the TAs to change your grade at the end of the semester. Do not ask to be allowed to do make-up or extra work at the end of the semester.

The Computer Science Department does not permit audits of graduate courses.

Absences and Late Assignments

Students who expect to do well in this course should keep up with the lectures. Windows for submission of the written assignments are shown on the course homepage.

The university has a policy[1] on what constitutes an excused absence. In the absence of a documented university-approved and verified excuse, late work will be accepted with the following penalty:

For each hour `t`, or any fraction thereof, that work is turned in late, the maximum points allowed for that assignment will be multiplied by $e^{(-0.5\lceil \frac{t}{12} \rceil)}$. Work more than 48 hours late will not be accepted.

Hours/Minutes/Seconds Late	Max Score Multiplied by
Not late	1.000
1 sec to 12 hours	0.607
12 hours 1 sec to 24 hours	0.368
24 hours 1 sec to 36 hours	0.223
36 hours 1 sec to 48 hours	0.135
48 hours 1 sec or more	0.000

Unless you have an officially documented excused absence, there will be no makeup midterm or final.

Homework Assignments

There will be five homework assignments this semester. Some of which will involve programming. These programs will be electronically submitted via the course Moodle page.

You may complete your assignments on any machine. However they will be evaluated on the EOS/Unity system here on campus. All submitted code must run in this environment in order to be graded. You are advised to test any code on the Unity system before submission.

All project deliverables must be submitted electronically follow the specified formats, submission instructions, and naming conventions. Unless otherwise explicitly stated, all assignments must be your own individual work. See the "Academic Integrity" section of the syllabus for further details.

Course Personnel

Instructor Dr. Collin F. Lynch (cflynch@ncsu.edu)

Teaching Assistants (TBD)

Office Hours

TA Office hours will be held (days TBD). TA office hours will be listed on the course website and any changes will be announced. Instructor office hours will be held in EBIII Room 2403 by appointment only.

[1] http://policies.ncsu.edu/regulation/reg-02-20-03

Questions

Technical or administrative questions that may be of interest to the class may be posted to the Moodle forums. These forums will be monitored by the instructional staff. Personal questions should be brought to the instructor or TAs during office hours.

Under no circumstances may you post code of any kind from any source to the message-board. Such posting will be treated as cheating on the assignment and referred to the Office of Student Conduct.

Academic Integrity

Students are required to comply with the university policy on academic integrity found in the Code of Student Conduct found at `http://policies.ncsu.edu/policy/pol-11-35-01`

All work that you turn in for grading must be your own. This means that all work must be an independent and individual creation by you. Any attempt to gain an unfair advantage in grading, whether for yourself or another, is a violation of academic integrity. You may only work on an assignment with another student(s) in the class if explicitly stated in the assignment.

Students who cheat on a homework, exercise, or exam or who aid others in doing so will receive a the negative of the total points available for the assignment and will be reported to the Office of Student Conduct in accordance with NCSU Policy. A first offense will place the student on Academic Probation for the remainder of their academic career. Placement on Academic Probation will prevent a student from serving as a TA as well as receiving other forms of financial assistance. Cheating is simply not worth it. Cheating is much worse than not turning in an assignment at all. **Cheating penalties are severe. They are permanent.**

The Computer Science department uses software that detects cheating on programming projects. Do not use other student's code, do not share your code, do not copy or use code from someone who took the class previously or from online sources.

Examples of Cheating (this list is NOT exhaustive):

- It is cheating to give any student access to any of your work which you have completed for individual class assignments.
- It is cheating AND plagiarism to use another person's work and claim it as your own. You are expected to complete all assignments on your own, unless otherwise specified in the assignment.
- It is cheating to interfere with another student's use of computing resources or to circumvent system security.
- It is cheating to email, ftp, post on the Internet, bulletin boards, message boards (including course forums), etc. your work for others to obtain. Do NOT use sites that allow you to "anonymously" post code. Those sites are searchable, and others may find your code (like the teaching staff).
- It is cheating to ask or pay another person or persons to complete an assignment for you.
- It is cheating AND plagiarism to decompile any compiled code and use the decompiled source code as your own. You may also break the law by decompiling code.
- It is cheating AND plagiarism to use code that you find online.
- It is cheating to give another student access to your account (NC State account or others that you use for university work) or to give them your account password.
- It is cheating for you and another student to work collaboratively on an assignment, unless otherwise specified by the assignment.

- It is cheating to circumvent the intention of the assignment and/or the automated grading system (e.g., by hard-coding test case solutions).

Examples of NOT Cheating (this list is NOT exhaustive):

- Using code distributed from the class locker is NOT considered to be CHEATING.
- Using code given to you by the course instructor and/or your TA is NOT CHEATING. However, you **must** give credit for this code in your program documentation.
- Using code from the course textbook is NOT CHEATING. However, you **must** give credit for this code in your program documentation.
- Modifying code that you wrote for one assignment for use on a different assignment is NOT CHEATING. However, you **must** indicate the course and assignment for which the code was originally written in your program documentation.
- Asking your Teaching Assistant or the instructor for assistance is NOT considered CHEATING.

Example Citations:

```
# (program/file or function definition level comments)
# I received help from Dr. Lynch on date XX during his office hours.
# We discussed constructor loops.
#
```

```
#
# The code for this function is based on Exercise Y that I completed on date.
#
```

Protecting Yourself

- Do not leave papers lying around your workstation.
- Do not dispose of important papers in the lab recycling bins and trash cans until after the assignment is graded.
- Do not give out your password.
- Do not leave your workstation unattended or forget to log yourself out.
- Do not leave your laptop unattended.
- Do not give other students access to any of your workspace or email them any code.
- Do not give other students access to your course materials or your personal computer.
- Do not email, ftp, or post your code on the Internet, message boards, etc.
- Keep all copies of final an intermediate work until after the assignment is graded.
- Keep all graded assignments until after you receive the final grade for the course.
- Do not discuss implementation details of the assignment with your peers.

Academic Honesty

See http://policies.ncsu.edu/policy/pol-11-35-01 for a detailed explanation of academic honesty.

Honor Pledge

Your name on any test or assignment or the electronic submission of an assignment through Moodle or other class courseware system indicates "I have neither given nor received unauthorized aid on this test or assignment."

Policy on Professional Conduct

The classroom is a professional environment. Students are expected to conduct themselves in a professional and courteous manner both within the classroom and in their out-of-class interactions. This includes their interaction with TAs, peers, and online. Documented complaints of uncivil, aggressive, harassing, or threatening behavior will be reported to the appropriate campus authorities and will be subject to additional sanctions as determined by the instructor.

Accommodations for Disabilities

Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, student must register with the Disability Services Office (http://www.ncsu.edu/dso), 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation at http://policies.ncsu.edu/regulation/reg-02-20-01.

Non-Discrimination Policy

NC State University provides equality of opportunity in education and employment for all students and employees. Accordingly, NC State affirms its commitment to maintain a work environment for all employees and an academic environment for all students that is free from all forms of discrimination. Discrimination based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation is a violation of state and federal law and/or NC State University policy and will not be tolerated. Harassment of any person (either in the form of quid pro quo or creation of a hostile environment) based on race, color, religion, creed, sex, national origin, age, disability, veteran status, or sexual orientation also is a violation of state and federal law and/or NC State University policy and will not be tolerated. Retaliation against any person who complains about discrimination is also prohibited. NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at http://policies.ncsu.edu/policy/pol-04-25-05 or http://www.ncsu.edu/equal_op/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

Supporting Fellow Students in Distress

As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom and the campus as a whole remains a healthy and safe environment for learning. Occasionally, you may come across a fellow classmate whose personal behavior concerns or worries you, either for the classmates well-being or yours. When this is the case, I would encourage you to report this behavior to the NC States Students of Concern website: http://go.ncsu.edu/NCSUcares. Although you can report anonymously, it is preferred that you share your contact information so they can follow-up with you personally.