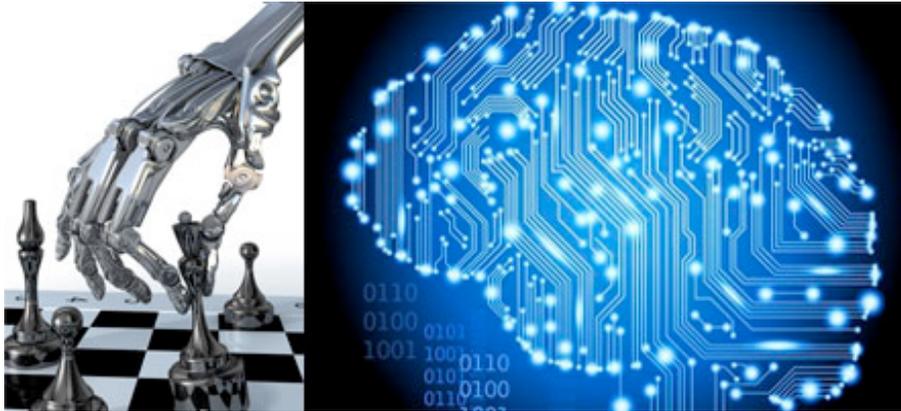


Artificial Intelligence

Fall Semester, 2016

Professor: Jeff Clune, University of Wyoming



COSC4550/COSC5550
Tu/Th 11:00 am - 12:15 pm
Room: EN (Engineering) 2108

Course Website: <http://jeffclune.com/courses/AI.html> (and on Piazza)

Office Hours:

Tu: 12:15-1:00, 1:30-3:00
Th: 12:15-1:00, 1:30-4:00

Summary: The course surveys the broad field of Artificial Intelligence (AI). Given the breadth of AI, the course will provide introductions to many of the main areas of AI. The class will strike a balance in between the extremes of covering all major areas superficially and drilling deeply into only a few areas. The goal is for students to understand the general principles of how to think about AI as well as the main approaches and techniques of many sub-disciplines. With that knowledge, students should gain the ability to recognize and or guess what type of AI fuels the technologies we encounter in daily life and the news. Such knowledge will also help students discover which areas of AI they would like to dive into more deeply in the future, perhaps in their research careers. Finally, it is my goal that you will learn about the intelligence of living creatures, including yourself. Unfortunately, given the large number of different AI sub-disciplines, many necessarily will not be covered at all. At the end of the class, students are encouraged to check which chapters of the textbook were not covered and to review those chapters to learn about other areas of AI.

Important Note: It is your responsibility to read every word of this document and plan accordingly. Aspects of this document may change during the semester. Such changes will be announced in class and/or on Piazza (explained below).

Textbook: [Artificial Intelligence: A Modern Approach](#), Russell and Norvig, *3rd edition*. Make sure to get the 3rd edition!

Additional Readings: Additional readings will be provided from the scientific literature.

Prerequisite skills: You should know how to program as well as a working knowledge of computational thinking (e.g. algorithmic complexity in the form of big-O notation, basic data structures, etc.). The programming for the AI challenges will be done in the language Python. You can program in the language of your choice for your final, course project. If you do not know Python you can learn it in a day or two by going through one of the many excellent tutorials online. Many people have successfully completed the course before without prior Python experience. You should also have a basic knowledge of statistics, probability, and linear algebra, although a motivated student can work on his or her own to fill in these skills as needed.

Readings: There will be readings associated with each class that you should read before class. See the course website for those assignments.

Difficulty: This class is hard and time-consuming. I am interested in your learning a lot about the fascinating field of artificial intelligence. Doing that requires hard work and long hours. You have been warned!

Graded Material:

AI Challenges: 30% of grade

AI Challenges allow you to implement AI algorithms to solve fun problems and *learn by doing*. The assignments, deliverables, and due dates will be announced during the course. Do not post the code you write for these challenges online or share them with anyone else.

Early Final: 30%.

The early final consists of a test on all of the knowledge covered in lecture and assigned readings up to the date of the test. The test will be held towards the end of the semester and will thus be more of a 3/4ths-term test rather than a true final.

Course Project: 30%.

You get to select some cool AI challenge, implement the AI, and share with your class what you did, why it is interesting, and how well it worked. You do not need to conduct new research in AI (i.e. come up with a new algorithm or solve a new type of problem), but you are encouraged to do something fun and novel (e.g. a new game or application, or

some wrinkle on previous AI work). You may use previous code and ideas, but (a) you must get written permission from me, including clearly stating in writing what ideas/code/etc. you are building off of, and (b) you must do something sufficiently new that involves and applies AI principles you have learned in this course.

The output of this project will be a video that presents the project. You will show this video in class and then answer questions about it. The video should be 2-5 minutes long (shorter is better **if** you can tell your story that quickly). The final videos will be posted on YouTube to share your work with the world. More information about the course project will be announced in class and/or on Piazza.

To make sure that the scope of your project is appropriate, you are required to have it approved by me ahead of time. The “must be approved by” date will be announced in class.

Participation: 10%.

You are encouraged to attend class, ask questions, participate in discussions, give high-quality grade evaluations to your peers, and be an active member in the Piazza online forum for the class (see below). Students will be rewarded for asking good questions on Piazza. Good questions share all of the necessary detail and reveal that you have tried to resolve the issue on your own before asking the question. Students will be especially rewarded for providing courteous, informative answers to the questions of others, or proactively making interesting posts (e.g. tricky technical solutions, interesting questions or articles for discussion, etc.).

Graduate vs. Undergraduate Students: The scope of the course project will be larger for graduate students. Additionally, they will do longer, harder AI Challenges, and occasionally will be assigned more reading material. Generally, the expectations for graduate students are higher, which will be reflected in the grades awarded.

Grades: A: $\geq 93\%$, A-: $\geq 90\%$, B+: $\geq 87\%$, B: $\geq 83\%$, B-: $\geq 80\%$, C+: $\geq 77\%$, C: $\geq 73\%$, C-: $\geq 70\%$, D+: $\geq 67\%$, D: $\geq 63\%$, D-: $\geq 60\%$, F: $< 60\%$

Late policy: Material within one day late, 10% deduction; within two days late, 25% deduction; within four days, 50% deduction. After four days, 100% deduction.

Piazza Online Community: You are required to sign up for the Piazza forum for this class at Piazza.com. More information about the early final and Course Project will be added to the course website and/or announced via Piazza during the semester. Make sure you are receiving emails from Piazza, or you will miss important course announcements!

Asking Questions Outside of Class: While questions in class are highly encouraged, please direct questions outside of class to the Piazza forum. That way your fellow classmates can also benefit from the answer you receive. Students also have been shown to learn much more when they are helping fellow classmates with material and when they are engaged in online communities. Please also help answer questions on Piazza! Note:

You should not expect that your question on Piazza will be answered. It is merely an additional tool that can help in the event that someone provides an answer. If you need an answer to a question, especially by a certain time, make sure to ask it in class or office hours.

Academic Integrity: You are not allowed to share code amongst yourselves or on Piazza. Also, do not post the code you write for the AI challenges online or share them with anyone else: doing so constitutes cheating. You are encouraged to discuss the class with other students, but you cannot give another student specific algorithms (detailed instructions, verbal pseudocode, code, etc.) for solving the homework problems. You are not allowed to copy or look at anyone else's code, including code found online, without prior permission from me. In other words, do not even look at anyone else's code or online code without getting permission first. If you use anyone else's code (yours or code you find online) after getting permission, you must explicitly report it (not in the comments of the code, but the project write-up: if there is no project write-up, you must mention it in the email in which you submit your assignment, or in some other direct way to me). In addition to these specific issues, you are obliged to follow the University's policy on academic integrity (see http://www.uwyo.edu/generalcounsel/_files/docs/unireg802.pdf). When in doubt, ask first! The University of Wyoming is built upon a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. I am a very laid-back person, except when it comes to academic dishonesty, for which I have no tolerance. Please don't force me to initiate disciplinary action against you!

Laptops & Smartphones: Please do not use smartphones or open laptops in class. Studies show that they distract from your ability to learn [1,2]. Also important: your use of them is very distracting to me while teaching, and that is not fair to everyone else.

Differently Abled Students: If you have a physical, learning, or psychological disability and require accommodations, the University policy is that you must first talk to University Disability Support Services (room 330 Knight Hall). They will then contact me regarding how to accommodate your needs, which I am very happy to do.

Attendance: Your attendance affects your participation grade and your ability to do well in the class. It is expected that you will attend every class unless something important and unavoidable prevents you from doing so. You are required to attend class the day the early final is being held and when final presentations are being made by you and your peers, which will happen in the last few regular classes and during the final examination time slot. For these dates, the only excuses allowed must be approved by the dean of students (i.e. a "University Excused Absence"). Mark these dates on your calendar and plan accordingly. The Final Exam time is posted online (though it is subject to change, so check back frequently), and can be found by Googling "Wyoming final exam schedule."

References:

[1] Oliveira, M. Students' use of laptops in class lowers grades: Canadian study. The Globe and Mail. 2013. <http://www.theglobeandmail.com/life/parenting/back-to-school/laptops-in-class-lowers-students-grades-canadian-study/article13759430/>

[2] Dealing with Digital Distractions in the Classroom.
<http://ajmccarthy.wordpress.com/2013/02/05/dealing-with-digital-distractions-in-the-classroom/>