CS 3610, Fall 2020  
Artificial Intelligence

General Information
Time and Place: MWF 10:00-10:50, ITTC 328 [You will be assigned an every-other-day schedule]
Class Website: http://www.cs.uni.edu/~schafer/3610/purple or http://www.cs.uni.edu/~schafer/3610/black
Credit Hours: Three (3). This course meets the Course Credit Hour Expectation outlined in the Course Catalog. Students should expect to work approximately 9-12 hours per week on this course between F2F and online lectures, readings, and programming activities.
Instructor: Dr. Ben Schafer
Email: schafer@cs.uni.edu
Office: 316 ITTC, phone 273-2187

Student/Office Hours:
- Due to Covid-19 restrictions, I will not be holding formal, face-to-face office hours. However, I am very willing and WANT to meet with you. I see three options:
  - If you have a quick question feel free to stop by my office and knock on my door if it says I am in and available. We can just talk for a few minutes in the hallway (wearing our masks of course).
  - If you want a bit more time, some privacy, or to show me something on your computer, than it might be better for us to use online software like Zoom.
    - The easiest way is to use my Google Calendar to schedule an appointment during regular student hours which is MWF, 9:00-9:50 AM, 11:00-11:50 AM, 1:00-1:50 PM
    - To set up an appointment use https://bit.ly/SchaferScheduler
  - If those times don’t work for you, PLEASE, send me an email and propose a specific alternative.
  - If you feel like we really need to be F2F but you need more than a hallway chat, we can use a larger space somewhere in the building. Reach out to me via email to set this up.

Course Information

Course Description
Models of intelligent behavior and problem solving; knowledge representation and search methods; learning; may include topics such as knowledge-based systems, language understanding, and vision.

Course Learning Outcomes
By the end of this semester students taking this course should be able to meet the following objectives:
- Explain what constitutes "Artificial" Intelligence and how to identify systems with Artificial Intelligence.
- Differentiate between the concepts of machine reasoning/behavior and human reasoning/behavior.
- Identify and properly use common vocabulary concerning artificial intelligence.
- Explain and implement various AI search algorithms (e.g. uninformed, informed, heuristic, genetic algorithms)
- Discuss strategies for agents in games of perfect and imperfect information
- Represent knowledge of the world using logic and infer new facts from that knowledge.
- Identify models of machine learning and discuss appropriate applications in various domains.
Course Requirements
Students in this course will rely heavily on the use of the computer. All of the learning materials and programming environments for this course are available from any computer with a web browser and internet access. You will need access to a computer with Internet access while off campus and when in the classroom. There should be a limited number of laptops available for use in the classroom. [Recognize that these are shared among students and you should use caution when using them both for your physical and cyber safety.]

We will be using an online version of the textbook "Artificial Intelligence: Foundations of Computational Agents (2nd Edition) by Drs. David Poole and Alan Mackworth.

https://artint.info/2e/html/ArtInt2e.html

This book is also available in print format should you prefer to purchase the physical textbook. I found it available new, for under $65 on Amazon.

Course Grading
NOTE: This description of course grading is based on the assumption that we complete the semester on-campus. If we move to a completely offline scenario, or if we have a significant disruption mid-semester, I may want/need to revise the grading scenario. In that case, I will clearly republish my expectations on the class website.

I use a grading system drawn from the philosophies of "standards-based" and "equitable" grading (https://gradingforequity.org/). The main idea is that I WANT you to succeed in the course by you showing me that you have learned the necessary material. In most cases, if you can't do this the first time you should be able to re-study and try again. You will earn multiple (8?) "grades" in this course. Each of these is a category of understanding that, for simplicity, is recorded as a score from 1-4 with the following meaning:

<table>
<thead>
<tr>
<th>Score</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>You submitted the deliverables or attempted the activity but you show little understanding of the standards of the activity. [NOTE, you can not pass this course (grade of C or higher) with any 1s in your grades]</td>
</tr>
<tr>
<td>2</td>
<td>You have made significant progress towards demonstrating competency but there are limited items that remain unsatisfied.</td>
</tr>
<tr>
<td>3</td>
<td>You have &quot;met&quot; the standards of the activity. [You have displayed minimum acceptable competency on this activity.]</td>
</tr>
<tr>
<td>4</td>
<td>You have &quot;exceeded&quot; the standards of the activity. [You have met the standards of competency and shown considerable depth of knowledge, personal insight, or have demonstrated competency multiple times]</td>
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</tbody>
</table>

These grades will (likely) consist of:
- 5 or 6 Competency Demos (CD)
  - You can think of these like exams.
  - Each will be administered using Blackboard.
  - You will be expected to be present during your section's scheduled offering unless you have made previous arrangements.
    - If you need to miss your section's scheduled CD you should expect to make it up in a proctored format using Zoom.
- If you do not like the grade you earned on the original CD, you will be provided an opportunity to ask questions, re-study the material, and attempt a second CD to improve your grade. Details on this will be provided when it becomes an option.
- The Final CD will be administered during the university scheduled exam period on Saturday, November 21st
  - This is the only activity all semester for which you will not be given an opportunity to improve your grade.

- 3 Programming Activities
  - Each programming activity will have an initial deadline and a secondary deadline.
    - Students who submit a working solution by the initial deadline will be able to earn a 4 level grade.
    - Students who submit a meaningful (but "non-working") solution by the initial deadline will be able to revise and resubmit by the secondary deadline for a 3 level grade.

End of semester grades will be assigned based on the following evaluation criteria

<table>
<thead>
<tr>
<th>Grade</th>
<th>Criteria</th>
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<tbody>
<tr>
<td>A</td>
<td>All scores are 3 or 4 AND equal or more 4s than 3s</td>
</tr>
<tr>
<td>B</td>
<td>All scores are 3 or 4</td>
</tr>
<tr>
<td>C</td>
<td>No scores of 1. No more than one score of 2. [all remaining scores are 3 or 4]</td>
</tr>
<tr>
<td>D</td>
<td>More (3s and 4s) than (1s and 2s). No zeros.</td>
</tr>
<tr>
<td>F</td>
<td>Any situation not handled above.</td>
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</tbody>
</table>

In most situations, grades earned are straight letter grades – no plusses or minuses. Because you have multiple opportunities to retake and earn better grades this isn't as rough as it might sound. However, I DO reserve the right to raise grades slightly (take a B grade to a B+) if I feel there are specific and individual circumstances that warrant this change from the above criteria.

**Course Structure and Policies**

Please note that Covid-19 will have an impact on this class. It has changed how I am structuring class time (since I only get to "see" you half the time) and it is VERY likely that we will have interruptions that may change the entire delivery and nature of this class. However, two of the most important rules I have put upon myself are "be flexible" and "always ask yourself what is best for your students." If you understand this and have a similar attitude, we should be fine.

I DO think that it is completely possible to pass this course (with an A even) without ever setting foot in the classroom. [In fact, I have taught this course three times in a nearly entirely online format.] If you have concerns about your health or safety, or if you need to miss class for some other legitimate reason, then you can (and should) stay home and make up the class from the materials posted on my website. Having said that, I think a lot of learning happens in the interaction that will take place in my classroom. Therefore, while attendance is not required it is encouraged if your health allows you to be here.

One of my approaches to designing this course is to use the face-to-face time wisely.
1) Certain activities – like the initial lectures over new material – can often be done just as effectively using pre-recorded, online videos.
2) We will often spend classroom time either practicing material as a group or giving you some time to work on programs individually.
3) The advantage of doing "homework" in class and "lectures" out of class is that, in most cases, this is much more efficient. You are far more likely to have questions or need help when you are actually
doing the programming. In this structure you are in my classroom (and I am available) when you most need the help.

4) This means that when you come to class I am going to assume that you have watched the content videos. If you have not you will be lost and the time spent in the room will be very ineffective.

5) To repeat, I expect that the pre-recorded lectures will give you a good foundation, but most of the learning will take place during the in-class activities. I point this out because your attendance (when you are safely able to be here) will be beneficial to learning enough to gain the expected "competency."

Scholastic Conduct
You are responsible for being familiar with the University’s Academic Ethics Policies - https://www.uni.edu/policies/301

Copying from other students is expressly forbidden. Doing so on competency demos or programming assignments will be penalized every time it is discovered. The penalty can vary from zero credit for the copied items (first offense) up to a failing grade for the course.

If an assignment makes you realize you don't understand the material it is ok to ask a classmate for help. But it should be a question designed to improve your understanding, not one designed to simply get the assignment done. Your final submission for assignments should be individual, original work unless otherwise specified. Any substantive contribution to your solution by another person or taken from a publication should be properly acknowledged in writing. Failure to do so is plagiarism and will necessitate disciplinary action. In addition to the activities we can all agree are cheating (plagiarism, bringing notes to a closed book exam, etc), assisting or collaborating on cheating is cheating. Cheating can result in failing the course and/or more severe disciplinary actions. Remember: Discussing assignments is good. Copying code or answers is not.

Also, remember that I WANT you to succeed in this course and you have a chance to submit work to me and get feedback on how to improve your grade. There simply isn't a reason to cheat in this class.

Accessibility
The University of Northern Iowa (UNI) complies with the Americans with Disabilities Act Amendments Act of 2008 (ADAAA), Section 504 of the Rehabilitation Act of 1973, the Fair Housing Act, and other applicable federal and state laws and regulations that prohibit discrimination on the basis of disability. To request accommodations please contact Student Accessibility Services (SAS), located at ITTC 007, for more information either at (319) 273-2677 or Email accessibility services@uni.edu. Visit Student Accessibility Services (https://sas.uni.edu/) for additional information.

Covid-19 Statement
Protecting our campus from COVID-19 depends on all of us acting with care and responsibility. To protect each other and our campus community, we are required to wear masks or face shields that cover our mouths and noses inside all campus buildings, including throughout the duration of class. We are asked to self-screen for COVID-19 symptoms, stay away from others and seek medical attention if we’re not feeling well and/or experience any symptoms such as a fever over 100.4, and to communicate and plan proactively to make up for missed learning. We will maintain physical distancing by sitting in designated areas in the classroom. In order to facilitate contact tracing, Black Hawk County requires us to sit in assigned seats, and you are asked to adhere to your assigned seat. If your assigned seat does not work well for you, please notify me immediately so that we can work together to reassign you. Failure to follow these requirements can result in students being referred to the student conduct process and faculty being referred to the Associate Provost for Faculty. We take these steps together recognizing that my mask protects you, your mask protects me, and together wearing masks protects the entire UNI community. Our collective actions will determine our ability to remain together in an in-person learning environment.