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### CSCI 555.01: Topics - Artificial Intelligence

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# CSCI 555: Applications of Artificial Intelligence

## Course information

Fall 2015

CSCI 555 section 1 (CRN: 74972)

TT 11:10 – 12:30 pm GBB 225

## Instructor information

Instructor: Alden Wright

Office: 407 Social Science

Email: [alden.wright@umontana.edu](mailto:alden.wright@umontana.edu)

Phone: 406 243-4790

Office hours: To be determined later.

## Prerequisites

M225 (Discrete Math) and CSCI 232 (Data Structures). A basic knowledge of probability would be very helpful, and STAT 341 is recommended.

## Class Format

There will be a mixture of lectures and class participation. Class participation counts towards your grade, and you can't participate if you don't come to class.

## Required Work

Most of the programming assignments for the class will be based on the Python Pacman framework developed by John DeNero and Dan Klein at Berkeley for the Berkeley CS 188 course. There are also challenging online assignments delivered via EdX. The website for the UC Berkeley course is <http://ai.berkeley.edu/home.html>. The Pacman assignments for the Berkeley course are available on this website. The assignments and resources on this website will be modified as the semester progresses and as assignments are posted. If you start early, you may need to re-download files.

There will be some additional assignments as well.

Students will be expected to participate in class, and a part of your grade will reflect this. You will be expected to do at least two mini-presentations.

Graduate students are required to do an additional project, which is described at [http://csweb1.cs.umt.edu/~wright/446/Graduate\\_Student\\_Project\\_Artificial\\_Intelligence.docx](http://csweb1.cs.umt.edu/~wright/446/Graduate_Student_Project_Artificial_Intelligence.docx).

## **Moodle**

There will be a Moodle class supplement for this course. (There is one supplement under CSCI 446 for both courses.) Assignments and other supplementary material will be posted in Moodle, and homework will be turned in via Moodle.

## **Recommended textbook**

"Artificial Intelligence, a Modern Approach" (3rd edition) by Stuart Russell and Peter Norvig. Readings from this book are helpful but not required, and the course will not closely follow this textbook.

## **Tentative topics covered:** (we will probably not have time to cover all of these)

- Introduction and overview
- Blind search such as depth-first, breadth-first, and uniform-cost search
- Current and projected developments in AI
- Heuristic search such as the A\* algorithm
- Adversary search such as minimax and alpha-beta search
- Markov decision processes
- Reinforcement learning
- Probability including the Bayes approach to probability
- Markov models
- Hidden Markov models
- Particle filters
- Bayes nets
- Local search and genetic algorithms
- Constraint satisfaction

## **Grading**

For undergraduates:

Exams: 45%

Class participation 10%

Homework and assignments: 45%

For graduates:

Exams: 40%

Class participation 8%

Homework and assignments: 40%

Graduate project: 12%

Late policy:

Late homework and assignments will be penalized 10% for each 24 hours that the assignment/homework is late.

## **Collaboration**

Discussion of problems and programs is OK if you acknowledge and describe the discussion when you turn in the assignment. You must write your own programs and assignments, and you must understand what you turn in. Copying from other students or from other sources is not allowed. I reserve the right to ask you to explain what you have done, and to adjust the grade assigned on the basis of this explanation. If it is evident that your understanding of what you turn in is weak, your grade will be lowered.

## **Additional Course guidelines and policies:**

### **Incompletes and late drops**

I will strictly follow University policy. In for me to consider an incomplete or late drop or change to audit status, you will have to submit documentation (such as a note from a doctor) to verify your reason for the incomplete or late drop. The acceptable reasons for a late drop are limited to: registration errors, accident or illness, family emergency, and change in employment schedule. See pages 20 and 21 of the catalog for the University policies.

[Student Conduct Code](#) (Self describing link)

### **Disability modifications (H3)**

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.