CSCI 362: Artificial Intelligence

Contents

1 Overview

1.1 Catalog Description

"Fundamental introduction to the broad area of artificial intelligence and its applications. Topics include knowledge representation, logic, search spaces, reasoning with uncertainty, and machine learning."

1.2   Prerequisites

Data Structures (CSCI 180).

1.3   Learning Outcomes

At the completion of this course, students will be able to do the following:

- Implement and analyze search algorithms such as best-first search, A*, min-max and alpha-beta pruning
- Develop software that uses logical-inference to solve a well defined problem.
- Model and solve problems involving uncertainty
- Develop software that implements artificial intelligence algorithms for machine learning.

1.4   Topical Outline

- Introduction to AI
- Propositional Logic
- First-order Predicate Logic
- Logic Programming
- Search Spaces, Games, and Problem Solving
- Reasoning with Uncertainty
- Machine Learning
- Neural Networks

2   Course Administration

2.1   The People

Instructor:	Dr. Michael Goldwasser
Email:	`goldwamh@slu.edu`
Web:	`http://cs.slu.edu/~goldwasser/`
Office:	Ritter Hall 108
Phone:	(314) 977-7039
Office hours:	Tuesdays 11:00–11:50am
	Wednesdays 2:00–3:00pm
	Thursdays 10:00–10:50am
	or by appointment

2.2 Class Meetings

The material will be presented in two weekly lectures with class participation. Attendance is expected, as these meetings will offer learning opportunities that cannot be re-created purely from readings. That said, for those who miss a lecture, information on the lecture topic can often be found on the course schedule web page.

Time: Tuesday/Thursday, 2:15–3:30pm
Place: Ritter Hall 121

2.3 Textbooks

The required textbook for this class is

Title: *Introduction to Artificial Intelligence*
Authors: Wolfgang Ertel
Publisher: Springer, 2011
ISBN: 978-0-85729-298-8

3 Online Resources

3.1 CSCI 362 Web Page: `cs.slu.edu/~goldwasser/362`

With the exception of the first day's printed handout, most of the information for this course will be distributed only by means of the course web page. This web site will contain all assignments, a schedule of lectures, detailed lecture notes and links to many other sources of information.

The web page contains some information (e.g. solutions, submitted assignments, individual grades) which is more sensitive and therefore which will be available to students in the class only after they have identified themselves properly. To gain access to these parts of the web page, a student must first complete an online questionnaire, creating a unique identity and password.

3.2 Electronic Assignment Submission

All assignments for this course must be submitted electronically! The submission procedure will be done through the course web page, and allows students to submit from any computer connected to the Internet. Each student in this class will be selecting a unique username/password combination solely for use in identifying the student when using the course web page.

3.3 Email with Instructor

Face-to-face contact in class and in office hours is most desirable. Yet email is a convenient form of communication as well. I try to respond to email promptly, including at least

once each evening when possible.

If your question involves your progress on a current programming assignment, my response will be more informative if you can point out the specific problem you have encountered, and if I am able to see all of your source code. Therefore I strongly suggest that you either attach all relevant files to the email or submit preliminary versions of such files through our online system.

4   Graded Work

4.1   Assignments (60%)

There will be a series of project-based assignments for the course. On certain assignments, you will be required to work individually; on others you will be allowed to work in pairs. Please respect the policy on Academic Integrity as given in Section 4.4. The assignments will be submitted electronically and generally due at 11:59pm on the assigned due date.

4.2   Exams (40%)

- **Midterm Exam (15%)**, Thursday, 17 October 2013, 2:15–3:30 p.m

- **Final Exam (25%)**, Tuesday, 17 December 2013, 2:00–3:50 p.m

4.3   Course Grades

Letter grades will be based on each students overall percentage of awarded points according to the following formula.

Student percentage above 90% will result in a grade of A   or better.
Student percentage above 87% will result in a grade of A- or better.
Student percentage above 83% will result in a grade of B+ or better.
Student percentage above 80% will result in a grade of B   or better.
Student percentage above 77% will result in a grade of B- or better.
Student percentage above 73% will result in a grade of C+ or better.
Student percentage above 70% will result in a grade of C   or better.
Student percentage above 67% will result in a grade of C- or better.
Student percentage above 60% will result in a grade of D   or better.
Student percentage below 60% will result in a grade of F.

Any modification to this scale at the end of the year will be *in favor of the students.* That is we may later decide to award an A to a student who is slightly below the above cutoff, but we certainly will not deny an A from someone who is above the cutoff.

4.4 Academic Integrity

Students are expected to have read and abide by the University statement on Academic Integrity as described in Saint Louis University's Undergraduate Catalog. A more detailed policy statement is given by The College of Arts & Science (`http://www.slu.edu/colleges/AS/`) which apply to this course as well.

In addition to those general statements, we wish to discuss our policy in the context of this course. When it comes to learning and understanding the **general course material**, you may certainly use other reference materials and you may have discussions with other students in this class or other people from outside of this class. This openness pertains to material from the text, practice problems, general syntax and use of the Python language or other computing tools.

However, when it comes to **work which is submitted for this course**, you are not to use or to search for any direct or indirect assistance from unauthorized sources, including but not limited to:

- other students in this class (except when explicitly allowed)
- past students, whether from this school or other schools
- other acquaintances
- other texts or books
- online information other than that referenced by course materials

Acceptable sources of information include consultations with the instructor, teaching assistants, or members of organized tutoring centers on campus, as well as any materials explicitly authorized in an assignment. Even in these cases, if you receive significant help you should make sure to <u>document</u> both the source of the help as well as the extent.

On <u>certain</u> assignments, we will explicitly allow students to work together. In this case, conversations between partners is both permissible and required. Furthermore, all students are expected to contribute significantly to the development of the submitted work. It is a violation to allow a partner to "sign on" to a submission if that partner did not significantly contribute to the work.

Any violations of these policies will be dealt with seriously. Penalties will apply as well to a student who is aiding another student. Any such violations will result in a minimum penalty of a zero on the given assignment which cannot be dropped, and severe or repeated violations will result in an immediate failing grade in the course. Furthermore all incidents will be reported in writing to the Department and/or the Dean, as per the College procedure.

4.5 Late Policies

All exams must be taken promptly at the required time. Requests for rescheduling an exam will only be considered if the request is made prior to the start of the exam, or else in an "emergency" situation with appropriate documentation.

For assignments, we wish to allow students to continue to work comfortably beyond the official deadline when a little more time will result in more progress, while at the same time discourage students from falling significantly behind pace and jeopardizing their success on future assignments. Our solution is the following exponentially decaying late formula (some have suggested that we should offer extra credit to anyone who fully understands this formula).

We will consider an assignment submission "complete" when any part of the assignment is last submitted or modified. Any assignment which is not complete promptly by its due date and time will be assessed a penalty based on the formula $S = R \cdot e^{-h/173}$, where S is the grade given, R is the grade the work would have received had it been turned in on time, and h is the amount of time (in hours or fractions thereof) that the work was late. Examples:

— work turned in 1 hour late receives over 99.6% of its original credit
— work turned in 5 hours late receives over 97% credit
— work turned in one full day late receives less than 88%
— work turned in two full days late receives less than 76%
— work turned in five days late receives less than 50%

The above policies will be waived only in an "emergency" situation with appropriate documentation.

5   Additional Information

5.1   Supporting Student Success

In recognition that people learn in a variety of ways and that learning is influenced by multiple factors (e.g., prior experience, study skills, learning disability), resources to support student success are available on campus. Students who think they might benefit from these resources can find out more about:

- Course-level support in the remainder of this section or by asking the instructor

- University-level support (e.g., tutoring/writing services, Disability Services) by visiting the Student Success Center (BSC 331) or by going to `www.slu.edu/success`.

Students who believe that, due to a disability, they could benefit from academic accommodations are encouraged to contact Disability Services at 314-977-8885 or visit the Student Success Center. Confidentiality will be observed in all inquiries.

Course instructors support student accommodation requests when an approved letter from Disability Services has been received and when students discuss these accommodations with the instructor after receipt of the approved letter.

5.2 Computing Resources at SLU

Our department runs a computer server named `turing` that serves as the primary computing environment for this course. If you do not already have an account on this machine, please let us know and we will create a new one. For further documentation regarding use of turing's facilities, see `cs.slu.edu/computing-resources`.

   Please note: you are not explicitly required to use `turing` as your computing platform, it is simply the only platform what we will officially support. If you wish to use another platform for completing your assignments, please feel free to do so.