

CSE 4308/5360 - Summer 2015 - Syllabus

Artificial Intelligence I

Course web page: http://vlm1.uta.edu/~athitsos/courses/cse4308_summer2015

Lecture times: Mon-Tue-Wed-Thu 1:00pm-3:00pm

Classroom: NH 110

Textbook: S. Russell and P. Norvig, "Artificial Intelligence: A Modern Approach", third edition (2009), Prentice Hall.

Instructor:

[Vassilis Athitsos](#)

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Office telephone: 817-272-0155

Office hours: Mon-Tue-Wed-Thu 11:45am-12:45pm

Teaching assistant (GTA):

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Office hours: Tue-Wed-Thu-Fri 4:00pm-5:00pm.

Course Description

Description of Course Content: This course gives an introduction to the philosophies and techniques of Artificial Intelligence. AI techniques have become an essential element in modern computer software and are thus essential for a successful career and advanced studies in computer science. Students successfully completing this course will be able to apply a variety of techniques for the design of efficient algorithms for complex problems. Topics covered in this course include search algorithms (such as breadth-first, depth-first, A*), game-playing algorithms (such as Minimax), knowledge and logic reasoning, planning methods (such as STRIPS and Graphplan), probabilistic reasoning, and machine learning.

Prerequisites: Programming Languages (CSE 3302) and Theoretical Concepts (CSE 3315).

Student Learning Outcomes: After successfully taking this course, a student should be familiar with standard approaches to artificial intelligence, be able to discuss pros and cons of these approaches, and be able to apply basic artificial intelligence methods.

Assignments

There will be several programming and written assignments in this course. The following class policies regarding assignments will be followed:

- Programming assignments have to run on the ACS machine *omega*, unless permission is obtained IN WRITING from the instructor or the teaching assistant.
- All assignments must be submitted via [Blackboard](#).
- No deadline extensions for the entire class will be provided. (See syllabus about policy on extensions for individuals, based on emergencies documented in writing).
- No extra credit will be provided.

Students are allowed to work with other persons on the assignments. At the same time, learning to solve problems on your own is the most important practice for the midterm and final exams. Students are welcome, and strongly encouraged, to work on the posted practice problems as well.

Late submission policy:

- All assignments are graded out of 100 points. Assignments submitted late will be penalized, at a rate of 4 penalty points per hour. The submission time will be the time shown on Blackboard. Any assignment submitted more than 25 hours late will receive no credit.
- Exceptions to late submission penalties will only be made for emergencies documented in writing, in strict adherence to UTA policy. For all such exception requests, the student must demonstrate that he or she made all efforts to notify the instructor as early as possible.
- Computer crashes, network crashes, and software or hardware failure will NOT be accepted as justification for late submissions. If you want to minimize chances of a late submission, aim to submit early. You can always revise your submission till the deadline.
- Sometimes students submit the wrong files on Blackboard. Unfortunately, no credit or waiver of late penalties can be provided in such cases.
- If you find yourself in an emergency situation and can not deliver a homework on time, immediately inform the instructor and teaching assistant. Even if you have a valid reason for delivering late an assignment, you must make a convincing case that you have notified the instructor and teaching assistant as early as possible.

If you want to minimize chances of a late submission, aim to submit early. You can always revise your submission till the deadline.

Exams

There will be three midterms and one final exam in this course. Each exam is worth 20% of the course grade. In total, exams will constitute 60% of the course grade. **No make-up exams will be offered.**

All exams are open-book, and students are free to bring any printed or handwritten material (textbooks, notes, etc.) to consult during the exam. Students will not be allowed to bring in any electronic aids, including pocket calculators.

Students are not allowed to talk or otherwise communicate with other students during an exam.

Absence from exams may be excused, with appropriate documentation, for illness, critical family emergencies, military service obligations, observance of major religious holidays, and certain university service commitments. Car or transportation problems will NOT be considered a legitimate reason to miss an exam. **Requests for excused absence, and documentation for such absences, must be provided as soon as possible. Even if the reason for an absence is valid, a request for an excused absence will be rejected if provided unjustifiably late.**

The final exam will take place on Monday, 08/17/2012, 1:00pm-3:00pm.

Attendance Policy

At The University of Texas at Arlington, taking attendance is not required. Rather, each faculty member is free to develop his or her own methods of evaluating students' academic performance, which includes establishing course-specific policies on attendance. As the instructor of this section, I will follow the following attendance policy: Attendance is NOT required for lectures, and will NOT be used in calculating the semester grade. However, attendance records will be kept, and students are responsible for the material covered in the lectures. The instructor and teaching assistant will NOT honor requests to fill students in on what they missed in class, unless the absence was justified by an emergency.

Attendance is required for exams. Absences for exams will only be excused for medical or other emergencies, in strict adherence with UTA policy. All emergencies must be reported as early as possible and **documented in writing**. No make-up exams will be given.

Transportation problems (e.g., flat tires) will NOT be considered a valid excuse for missing exams. To ensure attendance, plan to arrive to class well in advance, and have backup transportation plans available.

Class Participation

Class participation is optional, and will not be considered for the course grade. At the same time, students are highly encouraged to participate, by asking questions, as well as answering questions by the instructor. Class participation can be an important resource for students who have difficulty understanding any part of the course material.

Grading

Note to CSE 5360 students: For students enrolled in the graduate section CSE 5360 the homework assignments, as well as the exams, may contain additional problems which are not required for students enrolled in CSE 4308.

Exams and homework assignments will contribute to the overall grade in the following way:

Written Assignments	15%
Programming Assignments	25%
Midterm 1	20 %
Midterm 2	20 %
Final Exam	20 %

Any request for re-grading (for an assignment or midterm exam) must be made within 3 days of receipt of that grade. Any request for re-grading the final exam must be made within 2 days of receipt of that

grade. Re-grading can lead to a higher or lower grade, depending on the grading errors that are discovered.

Grading is based on the following absolute scale. To achieve a grade, you must achieve the required number of points in the course.

- A: 90%
- B: 80%
- C: 70%
- D: 60%
- F: below 60%.

The instructor reserves the right to lower these thresholds, based on the distribution of final percentages.

IMPORTANT: It should be clear to every student that course grades will depend **EXCLUSIVELY** on the above grading criteria. Students should not request nor expect any other factor to be considered in computing the course grade. For example, factors that will **NOT** be considered are: need of a better grade to keep financial aid, to stay in the program, or to graduate. Students are expected to carefully monitor their own performance throughout the semester and seek guidance from available sources (including the instructor) if they are concerned about their performance and the course grade that they will earn.

Withdrawals

The university withdrawal policy will be strictly adhered to. Up to the initial withdrawal date, all students will receive a W. After that date, the grade will be determined by the student's current average, and a WF or WP assigned as appropriate.

Expectations for Out-of-Class Study

Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend an additional minimum of 30 hours per week of their own time in course-related activities, including reading required materials, completing assignments, solving practice questions, and preparing for exams. More time may be needed for people having difficulties understanding the material. People with relatively weak mathematical background are expected to have more difficulties understanding the material, and to need more out-of-class study time.

Emergency Exit Procedures

Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit:

- Safely and calmly exit the classroom using either of the two doors.
- After exiting the door turn left, and walk to the exit, which is approximately 50 feet away from NH 110.

When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.

University Policies and Services

Grade Grievances:

Any appeal of a grade in this course must follow the procedures and deadlines for grade-related grievances as published in the current undergraduate and graduate catalogs.

Drop Policy:

The standard UTA drop policy applies to this course. Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. Students will not be automatically dropped for non-attendance. Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://wwwb.uta.edu/ses/fao>).

Americans With Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the Americans with Disabilities Act (ADA). All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Title IX:

The University of Texas at Arlington is committed to upholding U.S. Federal Law "Title IX" such that no member of the UT Arlington community shall, on the basis of sex, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity. For more information, visit www.uta.edu/titleIX.

Academic Integrity:

All students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence. I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

Instructors may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System Regents' Rule 50101, paragraph 2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Student Support Services:

UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

Electronic Communication:

UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey:

At the end of each term, students enrolled in classes categorized as lecture, seminar, or laboratory shall be directed to complete a Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student's feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington's effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Course Schedule

As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. The following schedule is tentative, and will be regularly updated.

Lectures Schedule

Lecture	Date	Chapters	Slides	Topic
1	Tue 07/14	1, 3.1-3.4	Introduction ((c)S. Russel) Uninformed Search ((c)S. Russel)	Course Details and Overview Solving Problems by Search
2	Wed 07/15	3.5-3.6	Informed Search ((c)S. Russel, Cook) Implementation Notes	Informed Search
3	Thu 07/16	5	Game Playing ((c)S. Russel) Implementation Notes	Game Playing
4	Mon 07/20	7	Logic and Inference ((c)S. Russel)	Knowledge and Logic Reasoning
5	Tue 07/21	7, 8	First Order Logic ((c)S. Russel)	Inference by Enumeration and Resolution First Order Logic
6	Wed 07/22	9	First Order Inference ((c)S. Russel)	Inference in First Order Logic
7	Thu 07/23	First Midterm		
8	Mon 07/27	10	Planning ((c)S. Russel)	Inference in First Order Logic (continued) Planning
9	Tue 07/28	10, 11	Notes on planning Conditional Planning ((c)S. Russel)	Planning, continued Conditional Planning and Replanning
10	Wed 07/29	13	Probability ((c)S. Russel)	Probability
11	Thu 07/30	14.1-14.4	Bayesian Networks ((c)S. Russel)	Bayesian networks
12	Mon 08/03	14.1-14.4		Bayesian networks, continued
13	Tue 08/04	18.1-18.3	Learning ((c)S. Russel)	Learning Methods, Decision Trees
14	Wed 08/05	18.1-18.3	Notes on Information Gain	Decision Trees, continued
15	Thu 08/06	Second Midterm		
16	Mon 08/10	20.1	MAP-ML ((c)S. Russel) Notes on MAP and ML	MAP estimation, ML estimation
17	Tue 08/11	18.7	Neural Networks ((c)S. Russel)	Neural Networks
18	Wed 08/12	18.7		Neural Networks, continued

19	Thu 08/13			Overview of Material for Final Exam
Final Exam	Mon 08/17	Final Exam, 1:00pm-3:00pm		

Assignments Schedule

- Assignment 0. Due Wednesday 7/15, 11:55pm.

You do not have to submit anything, and you will get no credit for it. However, if you do not complete this you may have problems submitting the next assignments on time.

- Task 1: make sure that you can log in to omega.uta.edu, and that you can compile a "hello world" program in your favorite language among C, C++, Java, and Python. If you have trouble logging in, contact helpdesk@uta.edu.
- Task 2: log in to [Blackboard](#) and submit: your source code, and the compiled executable. This is just to verify that you know how use the Blackboard system correctly, before the first assignment is due.
- [Programming Assignment 1](#). Due date: Mon 7/20, 11:55pm.
- [Written Assignment 1](#). Due date: Mon 7/20, 11:55pm. [Solution](#).
- [Programming Assignment 2](#). Assignment due Monday 07/27, 11:55pm.
- [Written Assignment 2](#). Assignment due Monday 07/27, 11:55pm. [Solution](#).
- [Programming Assignment 3](#). Assignment due Monday 08/03, 11:55pm.
- [Written Assignment 3](#). Assignment due Monday 08/03, 11:55pm. [Solution](#).
- [Written Assignment 4](#). Assignment due Tuesday 08/04, 11:55pm. [Solution](#).
- [Programming Assignment 4](#). Assignment due Monday 08/10, 11:55pm.
- [Written Assignment 5](#). Assignment due Wednesday 08/12, 11:55pm. [Solution](#).

Exams Schedule

- First midterm, Thu 07/23.
[Chapters covered and practice questions.](#) [Answers.](#)
You can also see questions from two midterms given in previous years:
 - [First sample midterm](#). On average, the questions here are relatively easy. For the answers [click here](#).
 - [Second sample midterm](#). On average, the questions here are relatively hard. For the answers [click here](#).
- Second midterm, Thu 08/06.
[Chapters covered and practice questions.](#) [Answers.](#)
You can also see questions from two midterms given in previous years:
 - [First sample midterm](#). For the answers [click here](#).
 - [Second sample midterm](#). For the answers [click here](#). Note: Don't worry about Question 1 on this exam, it falls outside the reading material for this semester.
- Final exam: Monday, 08/17.
[Chapters covered and practice questions.](#) [Answers.](#)
You can also see questions from one sample midterm:

- [Sample midterm](#). For the answers [click here](#).

Emergency Phone Numbers: In case of an on-campus emergency, call the UT Arlington Police Department at 817-272-3003 (non-campus phone), 2-3003 (campus phone). You may also dial 911.