

UNIVERSITY OF TEXAS AT ARLINGTON
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

4308/5360

ARTIFICIAL INTELLIGENCE I

FALL 2018

3 UNITS

Class Schedule: Tuesday and Thursday 15:30-16:50, Room 152, Business Building (COBA)

Section Information: CSE 4308-002, CSE 5360-002, CSE 5360-020

Instructor: William Beksi

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Office Hours: Tuesday and Thursday 14:00-15:00, ERB 523

TA: Sourabh Bose

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TA Office Hours: Monday and Wednesday 14:00-16:00, ERB 539

1 Course Objective

This course provides an introduction to the fundamental concepts of Artificial Intelligence (AI). Topics include: agents, search (search space, uninformed and informed search), game playing, planning, knowledge representation (logical encodings of domain knowledge, ontologies), and the programming language Lisp. The course is suitable to gain a solid technical background and as a preparation for more advanced work in AI. Upon successful completion of the course, the student will be able to:

- Understand the challenges and the usefulness of AI.
- Design a game playing program.
- Understand the various search algorithms.
- Implement a simple Lisp program.
- Understand the area of inference in first-order logic.
- Appreciate the issues involved in planning, knowledge bases, and reasoning systems.
- Understand the potential and current research issues in AI.

2 Prerequisites

Students are expected to have the following background:

- Knowledge of basic computer science principles and programming.
- Knowledge of algorithms and data structures.

3 Topics Covered

The course will cover the following topics:

- Agents.
- Search.
- Game playing.
- Lisp.
- Logic.
- First-order logic.
- Inference in first-order logic.
- Planning.
- Knowledge bases.
- Reasoning systems.

4 Textbook

[1] S. Russell and P. Norvig, “Artificial Intelligence: A Modern Approach”, 3rd Edition, Prentice Hall, 2009. ISBN: 9780136042594

5 Additional References (Not Required)

[1] P. Graham, “ANSI: Common Lisp”, Pearson, 1995. ISBN: 9780133708752

[2] P. Seibel, “Practical Common Lisp”, Apress, 2005. ISBN: 9781590592397

6 Web Resources

[1] AI resources, <http://aima.cs.berkeley.edu/books.html>.

[2] AI related resources, <http://airesources.org/>.

[3] Programming resources, <http://aima.cs.berkeley.edu/code.html>.

[4] Lisp code, etc., <http://aima.cs.berkeley.edu/lisp/doc/overview.html>.

7 Grading

The grade of the course will consist of the following components:

Homework Assignments	20%
Programming Assignment	10%
Project	15%
Mid-semester Exam (10/11/18)	20%
Final Exam (12/11/18)	35%

Students will give a short presentation of their project near the end of the semester. This presentation will count for 4% of the total class grade (this grade will be counted as part of the project grade).

8 Homework

Three homework assignments will be given during the semester. They will consist of problems that will help the student understand the material and monitor their progress. Homework assignments are due one week after they are assigned. Solutions to the homework assignments will be provided.

9 Programming Assignment

A programming assignment will be given during the semester. The programming assignment, written in Lisp, must be submitted three weeks after the day the assignment is given.

10 Project

Projects may take the following forms (students can work in groups of three):

- Literature survey (with critical evaluation) on a given topic.
- Theoretical work.
- Simulation or experiments.

Students will do presentations of their projects at the end of the semester. The project schedule is:

October 9th: Initial report. 1 to 2 pages explaining the project with a list of references.

November 6th: Partial report (3 to 5 pages).

December 4th: Final report (10 to 15 pages).

11 Course Schedule

Week	Topic
1	Introduction (Chapter 1)
2	Agents, Problem Solving, and Search (Chapters 2 and 3)
3	Uninformed and Informed Search (Chapter 3)
4	Search and Other Search Algorithms (Chapters 3 and 4)
5	Game Playing (Chapters 5 and 6)
6	Lisp
7	Logic (Chapter 7)
8	Review and Mid-semester Exam
9	First-Order Logic (Chapter 8)
10	Inference in First-Order Logic (Chapter 9)
11	Classical Planning (Chapter 10)
12	Planning and Acting (Chapter 11)
13	Knowledge Representation (Chapter 12)
14	Neural Networks and Deep Learning (Chapter 20)
15	Project Presentations
16	Review

This schedule is tentative and subject to change at instructor's discretion. Changes will be announced in class and on the course page. The instructor reserves the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course.

12 Attendance

Students are expected, but not required, to attend all lectures. Any material that the student missed will not be covered again in class. If the student is unable to attend a class due to personal reasons, then it is the responsibility of the student to use the textbook and online slides to learn the content and meet with either the instructor or the TA to clarify any doubts.

13 Drop Policy

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://www.uta.edu/aao/fao/>).

14 Disability Accommodations

UT 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), The Americans with Disabilities Amendments Act (ADAAA), and Section 504 of the Rehabilitation Act. 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 disability. Students are responsible for providing the instructor with official notification in the form of a **letter certified** by the Office for Students with Disabilities (OSD). Only those students who have officially documented a need for an accommodation will have their request honored. Students experiencing a range of conditions (Physical, Learning, Chronic Health, Mental Health, and Sensory) that may cause diminished academic performance or other barriers to learning may seek services and/or accommodations by contacting: **The Office for Students with Disabilities, (OSD)** <http://www.uta.edu/disability/> or calling 817-272-3364. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability.

15 Counseling and Psychological Services (CAPS)

www.uta.edu/caps/ or calling 817-272-3671 is also available to all students to help increase their understanding of personal issues, address mental and behavioral health problems and make positive changes in their lives.

16 Non-Discrimination Policy

The University of Texas at Arlington does not discriminate on the basis of race, color, national origin, religion, age, gender, sexual orientation, disabilities, genetic information, and/or veteran status in its educational programs or activities it operates. For more information, visit uta.edu/eos.

17 Title IX Policy

The University of Texas at Arlington (“University”) is committed to maintaining a learning and working environment that is free from discrimination based on sex in accordance with Title IX of the Higher Education Amendments of 1972 (Title IX), which prohibits discrimination on the basis of sex in educational programs or activities; Title VII of the Civil Rights Act of 1964 (Title VII), which prohibits sex discrimination in employment; and the Campus Sexual Violence Elimination Act (SaVE Act). Sexual misconduct is a form of sex discrimination and will not be tolerated. For information regarding Title IX, visit www.uta.edu/titleIX or contact Ms. Michelle Willbanks, Title IX Coordinator at (817) 272-4585 or titleix@uta.edu.

18 Academic Integrity

Students enrolled in all UT Arlington courses 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.

UT Arlington faculty members may employ the Honor Code in their courses by 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, 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. Additional information is available at <https://www.uta.edu/conduct/>. Faculty are encouraged to discuss plagiarism and share the following library tutorials <http://libguides.uta.edu/copyright/plagiarism> and <http://library.uta.edu/plagiarism/>.

19 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>.

20 Campus Carry

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes as prohibited. Under the new law, openly carrying handguns is not allowed on college campuses. For more information, visit <http://www.uta.edu/news/info/campus-carry/>.

21 Student Feedback Survey

At the end of each term, students enrolled in face-to-face and online classes categorized as “lecture,” “seminar,” or “laboratory” are directed to complete an online 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 via the SFS database is aggregated with that of other students enrolled in the course. Students’ anonymity will be protected to the extent that the law allows. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law and aggregate results are posted online. Data from SFS is also used for faculty and program evaluations. For more information, visit <http://www.uta.edu/sfs>.

22 Final Review Week

For semester-long courses, a period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week unless specified in the class syllabus. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

23 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 exits, which are located southeast and southwest of the classroom. These exits are shown in the Business Building evacuation diagram for Room 152 (http://www.uta.edu/campus-ops/ehs/fire/Evac_Maps_All/Evac.B/Evac.B.152.pdf). 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 individuals with disabilities.

24 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 <http://www.uta.edu/studentsuccess/success-programs/programs/resource-hotline.php>.

The IDEAS Center (2nd Floor of Central Library) offers FREE tutoring to all students with a focus on transfer students, sophomores, veterans and others undergoing a transition to UT Arlington. Students can drop in, or check the schedule of available peer tutors at www.uta.edu/IDEAS, or call (817) 272-6593.

The English Writing Center (411LIBR): The Writing Center offers FREE tutoring in 15-, 30-, 45-, and 60-minute face-to-face and online sessions to all UTA students on any phase of their UTA coursework. Register and make appointments online at <https://uta.mywconline.com>. Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see www.uta.edu/owl for detailed information on all our programs and services. The Library's 2nd floor Academic Plaza offers students a central hub of support services, including IDEAS Center, University Advising Services, Transfer UTA and various college/school advising hours. Services are available during the library's hours of operation: <http://library.uta.edu/academic-plaza>.

25 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. The non-emergency number is 817-272-3381.