CSE 4308/5360: Artificial Intelligence

Spring 2022

Instructor Information

Instructor
Vamsikrishna Gopikrishna, Ph.D.

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ERB 553

Email Address
vamsikrishna.gopikrishna@uta.edu

Website
https://crystal.uta.edu/~gopikrishnav/

Faculty Profile
https://mentis.uta.edu/explore/profile/vamsikrishna-gopikrishna

Office Hours

- Timings: **Monday/Wednesday 11:00 AM – 12:30 PM**
- Location: My office (ERB 553) or via TEAMS chat room (Link in Canvas)

If you are unable to meet during this time, please email instructor to setup an alternate meeting time.

Course Information

Section Information

- CSE 4308 001
- CSE 5360 001
- CSE 4309/5360 002
- CSE 4308/5360 003
- CSE 5360 004

Time and Place of Class Meetings
Class meetings for all sections will be On Campus

- **CSE 4308 001**: WH 311 – **Tuesday/Thursday 2:00 PM – 3:20 PM**
- **CSE 5360 001**: WH 311 – **Tuesday/Thursday 3:30 PM – 4:50 PM**
- **CSE 4308/5360 002**: NH 110 – **Tuesday/Thursday 7:00 PM – 8:20 PM**
- **CSE 4308/5360 003**: WH 311 – **Tuesday/Thursday 12:30 PM – 1:50 PM**
- **CSE 5360 004:** NH 202 – **Monday/Wednesday 2:30 PM – 3:50 PM**

Course Webpage

- Course slides, assignment problem statements, and sample exam material will be posted on: http://crystal.uta.edu/~gopikrishnav/classes/2022/spring/4308_5360/
- Videos, Submission Links for Assignments, and other material will be posted on: Canvas

Description of Course Content
This course introduces the basic 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. 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, probabilistic reasoning, and machine learning.

Student Learning Outcomes
Students successfully completing this course will be able to apply a variety of techniques for the design of efficient algorithms for complex problems

Required Textbooks and Other Course Materials
Slides of course content will be posted on the website. Recommended textbook: **Artificial Intelligence: A Modern Approach, 4th Edition by Stuart Russell, Peter Norvig**. Price: $82.70 - $206.75 at the UTA Bookstore (https://www.bkstr.com/texasatarlingtonstore/product/artificial-intelligence-991236-1). Note: 3rd or 2nd Edition is also acceptable.

Description of Assignments
There will be several written assignments and three programming mini projects in this course. If you find yourself in an emergency and cannot deliver homework on time, immediately inform the instructor. Also, while working with other persons on non-graded example problems from the textbook is a good way to help you develop your understanding and insight into the techniques of problem solving, homework solutions must be your work only. Violations of this will not be tolerated and result in severe penalties for all parties involved, in strict compliance to official UTA policy.
The Programming mini projects must be coded in base versions of C, C++, Python, Java. Alternatively, they must be coded to run on the ACS machine omega (All students will have an account on the ACS machine omega). Note that Omega compatibility is not required (just recommended). If any partial code is provided as part of the assignment, it will generally be only provided in a limited number of languages. However, you are under no obligation or requirement to use it. Additional details will be announced in class.
All submissions (written and programming) must be submitted via Canvas. No other methods of submission are accepted under any circumstances.
Certain assignment **may** be classified as optional assignments. These will be announced beforehand in class. Scores for these assignments will only be used if they will improve your average assignment score. Otherwise scores from these assignments will be ignored.

Late Submission policy for Assignments
The points each assignment graded out of will be provided as part of its description. Assignments submitted late will be automatically penalized, at a rate of **5% of assignment max points per hour late**. Late submission will not be accepted 12 hours after due date. **Note that for some assignments, submissions may not be accepted after the deadline** (such assignments will be announced in class beforehand). The submission due time (and the time the link will be available till) will be shown in Canvas. Exceptions will only be made for documented emergencies, in strict adherence to UTA policy. Computer/Network crashes, Submission of Incomplete files, Submission of Incorrect Files, Submitting at Incorrect Link are NOT acceptable excuses for late submissions. **No exceptions will be made**. To avoid problems with such crashes and last-minute problems, students are encouraged to submit as early as possible. They are also advised to ensure that their file was uploaded correctly before submitting it. You can always revise your submission till the deadline. If you are unable to work on/submit an assignment due to a valid documented reason (illness, critical family emergencies, military service obligations, observance of major religious holidays, and certain university service commitments) one makeup assignment may be provided that will be due during finals week

Description of Examinations
There will be three non-cumulative exams spread out throughout the course. All exams will have equal weight. No exam scores will be dropped. The exams will be held on campus as in-person exams barring any new developments in the COVID-19 pandemic. If the university requires exams to be moved online, then they will be held online via the Lockdown browser with Respondus monitoring system. Students are allowed 1 sheet of **handwritten** notes during the exam. These notes will have

to be submitted along with your exam (more details will be given in class). Students will also need a non-programmable standard or scientific calculator.

Exam Absence policy

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. Requests for excused absence, and documentation for such absences, must be provided as soon as possible. In case of excused absence, a makeup exam will be setup and conducted by the instructor at a date before the last day of finals week. **Even if the reason for an absence/non-attendance is valid, a request for an excused absence/re-attempt will be rejected if provided later than the day of the exam.** The dates for all the exams are subject to change. Any changes will be announced in class atleast a week in advance. Students are expected to be available till the last day of finals week. No accommodations will be made if the student will miss an exam due to being unavailable before the last day of finals week.

Academic Dishonesty Policy

If you are caught colluding or copying in the assignments (or exams):

- **First Offence**: You will be given a score of -50 points for that assignment (or exam) and an academic dishonesty report will be filed.
- **Second Offence**: You will be given a grade of F for the course and another academic dishonesty report will be filed.

This policy is not up for negotiation under any circumstances.

Technology Requirements

Students will need to be able program in C, C++, Python or Java for their programming assignments. They will also need to know how to scan and upload their written assignments as PDF files. They will need to be able to use Canvas to view supplementary material provided by the instructor, view any video material posted by the instructor and to submit assignments. They are also strongly recommended to get used to TEAMS as an alternative way to get in touch with the instructor. If due to the COVID-19 pandemic, any exams have to be moved online, students will have to use the Lockdown browser with the Respondus monitoring system for the exams in which case they will need a computer with a webcam and an internet connection to take their exam.

Grading Information

Grading

You will be assigned a numerical score based on your performance in your assignments and in your exams. Please note that all assignments/mini projects will be weighed equally in this calculation.

Material	Contribution to Final score
Written Assignments	20%
Programming Mini Projects	15%
Exam 1	20%
Exam 2	20%
Exam 3	20%
Attendance & In Class Quizzes	5%

This numeric score is converted to a letter grade according to the following rubric.

Numerical Score	Grade
>= 85	A
>= 70 & < 85	B
>= 55 & < 70	C
>= 40 & < 55	D
Otherwise	F

For the Exams and Assignments, if any tasks were graded incorrectly (a correct answer given less than full credit) or if there is a totaling error, please contact either the TA or the instructor ASAP. Any partial credit obtained for incorrect tasks is not up for discussion/negotiation.
Students are expected to keep track of their performance throughout the semester and seek guidance from available sources (including the instructor) if their performance drops below satisfactory levels. **No makeup exams or assignments will be provided for the purpose of bumping up your grade under any circumstances**.

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 University Catalog.

Course Schedule

CSE 5360 004 (**Mondays and Wednesdays**)

Week	L.No2	Date	Topic
1	1	1/19/2022	Course Details, Overview
2	2	1/24/2022	Agents, Solving Problems with search
2	3	1/26/2022	Uninformed Search, Informed Search
3	4	1/31/2022	Informed Search (Contd.)
3	5	2/2/2022	Game Playing
4	6	2/7/2022	Game Playing (Contd.), Constraint Satisfaction Problems
4	7	2/9/2022	Constraint Satisfaction Problems (Contd.)
5	8	2/14/2022	Knowledge and Logic Reasoning
5		2/16/2022	EXAM 1 Material Review, Q & A
6		2/21/2022	EXAM 1 - All Mon/Wed Sections
6	9	2/23/2022	Knowledge and Logic Reasoning (Contd.), First Order Logic
7	10	2/28/2022	First Order Logic (Contd.), Planning
7	11	3/2/2022	Planning (Contd.)
8	12	3/7/2022	Contingency Planning, Online Replanning
8	13	3/9/2022	Probability
9		3/14/2022	SPRING VACATION - NO CLASS
9		3/16/2022	SPRING VACATION - NO CLASS
10	14	3/21/2022	Prior and Posterior Probabilities
10	15	3/23/2022	Inference by Enumeration
11	16	3/28/2022	Bayesian Networks
11		3/30/2022	EXAM 2 Material Review, Q & A
12		4/4/2022	EXAM 2 - All Mon/Wed Sections
12	17	4/6/2022	Bayesian Networks (Contd.)
13	18	4/11/2022	Learning
13	19	4/13/2022	Decision Trees
14	20	4/18/2022	Decision Trees (Contd.), Real World Decision Trees
14	21	4/20/2022	Bayesian Classifiers
15	22	4/25/2022	Probability Estimations
15	23	4/27/2022	Neural Networks, Backpropagation Learning
16		5/2/2022	EXAM 3 Material Review, Q & A
16		5/4/2022	STUDENT STUDY DAY - NO CLASS
17		5/9/2022	EXAM 3 - CSE 5360 004

This schedule is tentative and subject to change at instructor's discretion. Changes will be announced in class. The instructor reserves the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. EXAM 1 and EXAM 2 will be held at regular class timing in the same location as lectures. EXAM 3 location, date and time is subject to change by the University. Please visit: https://www.uta.edu/records/calendars/final-exams.php to get the updated date, time, and location information (unless otherwise mentioned, location is the same as lectures). Students should be prepared to be available till the end of Finals Week in case of any changes to EXAM 3 scheduling.

CSE 4308 001, 5360 001, 4308/5360 002 and 4308/5360 003 (**Tuesdays and Thursdays**)

Week	L.No2	Date	Topic
1	1	1/18/2022	Course Details, Overview
1	2	1/20/2022	Agents, Solving Problems with search
2	3	1/25/2022	Uninformed Search, Informed Search
2	4	1/27/2022	Informed Search (Contd.)
3	5	2/1/2022	Game Playing
3	6	2/3/2022	Game Playing (Contd.), Constraint Satisfaction Problems
4	7	2/8/2022	Constraint Satisfaction Problems (Contd.)
4	8	2/10/2022	Knowledge and Logic Reasoning
5	9	2/15/2022	Knowledge and Logic Reasoning (Contd.), First Order Logic
5		2/17/2022	EXAM 1 Material Review, Q & A
6		2/22/2022	EXAM 1 - All Tue/Thu Sections
6	10	2/24/2022	First Order Logic (Contd.), Planning
7	11	3/1/2022	Planning (Contd.)
7	12	3/3/2022	Contingency Planning, Online Replanning
8	13	3/8/2022	Probability
8	14	3/10/2022	Prior and Posterior Probabilities
9		3/15/2022	SPRING VACATION - NO CLASS
9		3/17/2022	SPRING VACATION - NO CLASS
10	15	3/22/2022	Inference by Enumeration
10	16	3/24/2022	Bayesian Networks
11	17	3/29/2022	Bayesian Networks (Contd.)
11		3/31/2022	EXAM 2 Material Review, Q & A
12		4/5/2022	EXAM 2 - All Tue/Thu Sections
12	18	4/7/2022	Learning
13	19	4/12/2022	Decision Trees
13	20	4/14/2022	Decision Trees (Contd.), Real World Decision Trees
14	21	4/19/2022	Bayesian Classifiers
14	22	4/21/2022	Probability Estimations
15	23	4/26/2022	Neural Networks, Backpropagation Learning
15	24	4/28/2022	Backpropagation Learning (Contd.)
16		5/3/2022	EXAM 3 Material Review, Q & A
16		5/5/2022	EXAM 3 - CSE 4308/5360 003, CSE 5360 001
17		5/10/2022	EXAM 3 - CSE 4308 001, CSE 4308/5360 002

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Institutional Information

UTA students are encouraged to review the below institutional policies and informational sections and reach out to the specific office with any questions. To view this institutional information, please visit the Institutional Information page (https://resources.uta.edu/provost/course-related-info/institutional-policies.php) which includes the following policies among others:

- Drop Policy
- Disability Accommodations
- Title IX Policy
- Academic Integrity
- Student Feedback Survey
- Final Exam Schedule

Additional Information

Face Covering Policy
While the use of face coverings on campus is no longer mandatory, all students and instructional staff are strongly encouraged to wear face coverings while they are on campus. This is particularly true inside buildings and within classrooms and labs where social distancing is not possible due to limited space. If a student needs accommodation to ensure social distancing in the classroom due to being at high risk, they are encouraged to work directly with the Student Access and Resource Center to assist in these accommodations. If students need masks, they may obtain them at the Central Library, the E.H. Hereford University Center's front desk or in their department.

Attendance
Students are expected to attend all lectures. Attendance will be taken during every lecture that occurs after census date and will be part of your final grade. Any material that the student missed will not be covered again in class. At random points during the lectures, I will conduct in class quizzes. The scores of these quizzes will be used as part of your final grade. Absence from classes may be excused, with appropriate documentation, for illness, critical family emergencies, military service obligations, observance of major religious holidays, and certain university service commitments. Documentation regarding any reasons for absence must be provided to the instructor by the end of the week of the missed lecture. If the student is unable to attend a class due to approved or personal reasons, it is the student's responsibility to use the slides/videos posted online or the lecture archives on canvas and the textbook to learn the content and to contact either the Instructor or the TA to clarify any doubts

At the University of Texas at Arlington, taking attendance is not required but attendance is a critical indicator of student success. 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 be following the attendance policy described above. However, while UT Arlington does not require instructors to take attendance in their courses, the U.S. Department of Education requires that the University have a mechanism in place to mark when Federal Student Aid recipients "begin attendance in a course." UT Arlington instructors will report when students begin attendance in a course as part of the final grading process. Specifically, when assigning a student, a grade of F, faculty report must the last date a student attended their class based on evidence such as a test, participation in a class project or presentation, or an engagement online via Canvas. This date is reported to the Department of Education for federal financial aid recipients.

Emergency Exit Procedures
Should we experience an emergency event that requires evacuation of the building, students should exit the room and move toward the nearest exit, which is given in the Evacuation Route Maps given below. When exiting the building during an emergency, do not take an elevator but use the stairwells

instead. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist individuals with disabilities.

Evacuation Route Maps:

- WH 311: Front
- NH 110: Front
- NH 202: Front

Students should also be encouraged to subscribe to the MavAlert system that will send information in case of an emergency to their cell phones or email accounts. Anyone can subscribe at Emergency Communication System.

Academic Success Center
The Academic Success Center (ASC) includes a variety of resources and services to help you maximize your learning and succeed as a student at the University of Texas at Arlington. ASC services include supplemental instruction, peer-led team learning, tutoring, mentoring and TRIO SSS. Academic Success Center services are provided at no additional cost to UTA students. For additional information visit: Academic Success Center. To request disability accommodations for tutoring, please complete this form.

The IDEAS Center (https://www.uta.edu/ideas/) **(**2nd Floor of Central Library) offers **FREE** tutoring and mentoring 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 the Writing Center (https://uta.mywconline.com). Classroom visits, workshops, and specialized services for graduate students and faculty are also available. Please see Writing Center: OWL for detailed information on all our programs and services.

The Library's 2nd floor Academic Plaza (http://library.uta.edu/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.

Librarian to Contact
Each academic unit has access to Librarians by Academic Subject that can assist students with research projects, tutorials on plagiarism and citation references as well as support with databases and course reserves.

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. Non-emergency number 817-272-3381

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