TEXAS A&M UNIVERSITY

CSCE 625: Artificial Intelligence Syllabus

Course Information

Course Number:	CSCE625
Course Title:	Artificial Intelligence
Credit Hours:	3
Section:	600
Time:	Tue/Thur 12:45 PM to 2:00 PM
Location:	ZACH 244

Instructor Details

Instructor:	Dr. Dylan Shell
Office:	PETR 315
Phone:	(979) 845-2369
E-Mail:	dshell@tamu.edu
Office Hours:	Thursdays 2:00 PM to 4:00 PM, also by appointment too.

Teaching Assistant Details

TA:	Peiman Mohseni
E-Mail:	peiman.mohseni@tamu.edu
Office Hours:	Mondays and Wednesdays 11:30 AM to 12:30 PM, and by appointment.

Course Webpage: https://robotics.cs.tamu.edu/dshell/cs625

Course Description

Fundamental concepts and techniques of intelligent systems; representation and interpretation of knowledge on a computer; search strategies and control; active research areas and applications such as notational systems, natural language understanding, vision systems, planning algorithms, intelligent agents and expert systems.

The course is a broad survey that will require a significant amount of reading with simple introductory programming in different languages. It will provide an understanding of the state of the practice of AI and set the foundation for further study in agency, logic, neural networks, robotics, uncertainty, and computer vision.

Course Pre- and co-requisites

A course dealing with Design and Analysis of Algorithms, e.g., the class CSCE 411, or equivalent.

Course Learning Outcomes

- *List the basic techniques for creating intelligent programs. This will be measured by tests/quizzes.*
- *Create a successful program illustrating the operation of one of these methods. This will be measured by the programming assignments.*
- *Apply the right programming language or technique to the right problem and be able to evaluate a proposed AI application for likelihood of success. This will be measured by programming assignments.*
- *Be able to discern sensationalism from science on the possible impact of AI on society. This will be assessed by the final/communication project.*

Textbook and/or Resource Materials

Artificial Intelligence: A Modern Approach 3rd Edition by Stuart Russell and Peter Norvig, 2009, or
Artificial Intelligence: A Modern Approach 4th Edition by Stuart Russell and Peter Norvig, 2020.

Grading Policy

- *The grading scale is:*
  - *A 90-100*
  - *B 80-89*
  - *C 70-79*
  - *D 60-69*
  - *F 59 or below*
- *Grades will be based on:*
  - *50%−X : 2 × Midterm exams (individual)*
  - *$X \in$ [30%...50%] : Programming portfolio*
  - *50% : Communication project*
    - *Video project (individual or pair) + review*
    - *Essay/paper (individual) + review*

  The (50%−X) is determined by which programming assignments you do.

Late Work Policy

- *Work is expected to be completed by the due date. Occasionally the instructor will permit an extension to the deadlines, but those extensions will apply to every student equally. Standard university reasons for lateness shall be respected so long as the student communicates with the instructor **as soon as possible**—this means, specifically, it has been communicated before the deadline has passed and not ex post facto.*

Course Schedule

Week-by-week topic breakdown

Week	Topic	Core Readings (from R&N 3rd; others will be posted)
1	*Introduction, Agents*	*1 & 2*
2	*Search*	*3*
3	*Local Search, Search for games*	*4 & 5*
4	*Constraint satisfaction*	*6*
5	*Knowledge representation*	*7*
6	*Logic: Foundations*	*8*
7	*Logic: Automated Inference*	*8*
8	*Logic: Resolution-based Inference*	*9*
9	*Planning*	*10*
10	*Learning Basics*	*18.1-18.6*
11	*Neural networks*	*18.7*
12	*Reinforcement Learning*	*21.1, 21.2*
13	*Philosophical Foundations*	*26*

Important due dates:

Date	Item	Weight
1 Mar.	*Midterm Exam 1*	*0-25%*
14-18 Mar.	SPRING BREAK	
5 Apr.	*Communication Project Draft*	*12.5%*
12 Apr.	*Communication Project Feedback*	*12.5%*

19 Apr.	*Midterm Exam 2*	*0-25%*
3 May	*Communication Project Final Submission*	*25%*

Programming Portfolio:

The course will include at least 7 programming portfolio, which must be submitted by the prescribed deadline for credit. The assignments are not worth equal grade value and the effort needed will vary quite markedly. You must do the required 3 assignments; the other 4 can be submitted if you choose. If you submit those, they reduce the impact of the exams on your score.

Week (±)	**Required**	**Programming Assignment**	**Weight**
2	**Yes**	***Lazy BFS (Scheme)***	***15%***
3	No	*Pacman Search (Python)*	*7%*
4	No	*Equation Simplifier (Own choice)*	*18%*
5	**Yes**	***Packing Puzzle (Own choice)***	***15%***
7	No	*Pacman Adversarial Search (Python)*	*10%*
11	**Yes**	***Wumpus world! (Prolog)***	***30%***
12	No	*Planning (PDDL)*	*5%*

Teaching technology/infrastructure:

The class will make use of canvas and the course website (see URL above).

Because this is a graduate class, the lectures are intended to be fairly interactive and involve substantial discussion from the class. As such, they will be delivered solely in person. (This may be altered, subject to whether the pandemic causes mass absenteeism.)

University Policies

Attendance Policy

Students are expected to attend class and to complete their assignments and examinations. The university views class attendance and participation as an individual student responsibility. They do not carry any grade for this course.

Please refer to Student Rule 7 in its entirety for information about excused absences, including definitions, and related documentation and timelines. **Please pay careful attention: an interview is only considered an excused absence in very particular circumstances, which tend to happen very rarely for CS jobs**.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor. In cases where the decision is at the instructor's discretion, the likelihood of an accommodation/makeup is directly related to whether the student communicates with the instructor as soon as possible; requests for foreseeable absences that are made only after the absence will not be granted.

Please refer to Student Rule 7 in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" (Student Rule 7, Section 7.4.1).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" (Student Rule 7, Section 7.4.2).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (See Student Rule 24.)

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, Student Rule 20).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact Disability Resources in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu. Disabilities may include, but are not limited to attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability related needs with Disability Resources and their instructors as soon as possible.

Title IX and Statement on Limits to Confidentiality

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit gender-based discrimination and sexual harassment, including sexual assault, sexual exploitation, domestic violence, dating violence, and stalking.

With the exception of some medical and mental health providers, all university employees (including full and part-time faculty, staff, paid graduate assistants, student workers, etc.) are Mandatory Reporters and must report to the Title IX Office if the employee experiences, observes, or becomes aware of an incident that meets the following conditions (see University Rule 08.01.01.M1):

- The incident is reasonably believed to be discrimination or harassment.
- The incident is alleged to have been committed by or against a person who, at the time of the incident, was (1) a student enrolled at the University or (2) an employee of the University.

Mandatory Reporters must file a report regardless of how the information comes to their attention – including but not limited to face-to-face conversations, a written class assignment or paper, class discussion, email, text, or social media post. Although Mandatory Reporters must file a report, in most instances, you will be able to control how the report is handled, including whether or not to pursue a formal investigation. The University's goal is to make sure you are aware of the range of options available to you and to ensure access to the resources you need.

Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with Counseling and Psychological Services (CAPS).

Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the University's Title IX webpage.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors that influence a student's academic success and overall wellbeing. Students are encouraged to engage in proper self-care by utilizing the resources and services available from Counseling & Psychological Services (CAPS). Students who need someone to talk to can call the TAMU Helpline (979-845-2700) from 4:00 p.m. to 8:00 a.m. weekdays and 24 hours on weekends. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at suicidepreventionlifeline.org.