

Course Syllabus

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CSCE 420-501 Artificial Intelligence : Syllabus

Course Information

Course Number: 420

Course Title: Artificial Intelligence

Section: 501

Time: TR 11:00am-12:25 pm

Location: ZACH 310

Credit Hours: 3

Instructor Details

Instructor: Yoonsuck Choe

Office: PETR 327

Phone: 979-845-5466

E-Mail: choe@tamu.edu

Office Hours: TF 2:30pm-4:00pm (Zoom only: <https://tamu.zoom.us/my/yoonsuckchoe>
(<https://tamu.zoom.us/my/yoonsuckchoe>.)

TA: Jin Hyun Park

Office: TBA

Phone: TBA

E-Mail: jinhyun.park@tamu.edu

Office Hours: TBA

Grader: Vicente Balmaseda

E-Mail: vibalcam@tamu.edu

Office Hours: None

Course Description

From the course catalog: 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.

Specific to this course:

To understand the problems in AI and to learn how to solve them:

1. traditional methods in AI (search, pattern matching, logical inference, theorem proving, planning, etc.).
2. modern approaches in AI (learning, probabilistic approaches, etc.).

Course Prerequisites

CSCE 411 (<https://catalog.tamu.edu/search/?P=CSCE%20411>) or approval of instructor.

Special Course Designation

None.

Course Learning Outcomes

1. Understand the basic techniques for creating intelligent programs. This will be measured by homeworks and exams.
2. Create successful computer programs illustrating the operation of these methods. This will be measured by the programming assignments.
3. 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.
- 4.

Textbook and/or Resource Materials

Stuart Russell and Peter Norvig, *Artificial Intelligence: A Modern Approach* (AIMA, hereafter), 4th **Edition**, Prentice Hall, New Jersey, 2020.

Book Homepage (<http://aima.cs.berkeley.edu/>)

[Optional] Henry Brighton and Howard Selina, *Introducing Artificial Intelligence: A Graphic Guide*, Icon Books, 2010.

Book web page (<https://iconbooks.com/ib-title/introducing-artificial-intelligence/>)

Note: Earlier print of this book under the title "Introducing Artificial Intelligence" is the same in its content. Original publishing year is 2003.

Grading Policy

1. Exams: 45% (midterm: 20%, final: 25%)

Make up exams:

- Only cases allowed under "Excused Absences" under TAMU **Student Rules, Rule 7. Attendance** (<https://student-rules.tamu.edu/rule07/>) will be eligible for make up exams. See 7.2 Absences and 7.3 Absence Documentation and Verification. Please read this very carefully. (For example, non-acute medical service does not constitute an excused absence, and it is the student's responsibility to provide documentation substantiating the reason for absence.)
- There will be no make up exam for those who do not show up for the exam without prior notice.
- **Make up exams will be different from the original exams although the difficulty will be adjusted to be comparable.**

Exam rules

- All exams will be closed book. Put all books, notes (exception below), cell phones, calculators, or any information containing media in your bag.
- You may bring a 1-sheet hand-written note (US letter paper; you can use both sides). Write your full name on the top left corner of page 1. A4 or any other sized paper, two pages glued together, photocopied or printed notes, name not written or not written in the exact location specified are all in violation of this rule, and this will result in a 10-point penalty.
- (Depending on the classroom) If you're right handed, sit in a right-handed seat. If you're left handed, sit in a left-handed seat.
- Bring your student ID or Texas driver's license. You will not allowed to take the exam without an ID.
- Aggie honor code will be strictly enforced.

2. Homeworks (includes written and programming): 50% (12%, 12%, 13%, 13%).

3. Attendance : 5%, based on attendance. Each absence will deduct 1% (out of 5%) of the attendance score. Excused absences will only be allowed for those listed in the university rules.

There will be no curving. The cutoff for an 'A' will be 90% of total score, 80% for a 'B', 70% for a 'C', 60% for a 'D', and below 60% for an 'F'.

Late Work Policy

Late penalty: 1 point (out of 100) per hour. Late submissions will not be accepted 4 days after the deadline and/or after the solution has been posted.

Course Schedule

Topics:

1. Introduction
2. Search
3. Game playing, alpha-beta pruning
4. Propositional Logic, first-order logic, theorem proving
5. Planning
6. Uncertainty, probabilistic approaches
7. Learning
8. Advanced topics (including Deep Learning)

Schedule (rough):

- week 1: introduction
- week 2: search: uninformed
- week 3: search: informed
- week 4: game playing
- week 5: propositional logic and theorem proving
- week 6: first-order logic and theorem proving
- week 7: first-order logic and theorem proving
- week 8: planning, Midterm Exam
- week 9: uncertainty and probabilistic reasoning
- week 10: machine learning intro
- week 11: machine learning: decision trees
- week 12: machine learning: neural networks
- week 13: advanced topics: deep learning [Thanksgiving week]
- week 14: advanced topics: deep learning
- week 15: course wrap up ; Final exam

Optional Course Information Items

- All homeworks and programming assignments will be assigned on google colab (use TAMU NetID to login).
- All submissions will be made through Canvas.

University Policies

This section outlines the university level policies. The TAMU Faculty Senate established the wording of these policies.

[NOTE: Faculty members should not change the written statements. A faculty member may add separate paragraphs if additional information is needed.]

Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to **Student Rule 7** [_\(https://student-rules.tamu.edu/rule07/\)_](https://student-rules.tamu.edu/rule07/) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

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.

Please refer to **Student Rule 7** [_\(https://student-rules.tamu.edu/rule07/\)_](https://student-rules.tamu.edu/rule07/) 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** [_\(https://student-rules.tamu.edu/rule07/\)_](https://student-rules.tamu.edu/rule07/)).

"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** [_\(https://student-rules.tamu.edu/rule07/\)_](https://student-rules.tamu.edu/rule07/)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. (**See Student Rule 24** [_\(https://student-rules.tamu.edu/rule24/\)_](https://student-rules.tamu.edu/rule24/)).

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** [_ \(https://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules/\)](https://aggiehonor.tamu.edu/Rules-and-Procedures/Rules/Honor-System-Rules/)).

Texas A&M at College Station

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu [_ \(https://aggiehonor.tamu.edu/\)](https://aggiehonor.tamu.edu/).

Texas A&M at Galveston

You can learn more about the Honor Council Rules and Procedures as well as your rights and responsibilities at [tamug.edu/HonorSystem](https://www.tamug.edu/HonorSystem/). (https://www.tamug.edu/HonorSystem/)

Texas A&M at Qatar

*You can learn more about academic integrity and your rights and responsibilities at Texas A&M University at Qatar by visiting the **Aggie Honor System** [\(https://www.qatar.tamu.edu/students/academic-services/aggie-honor-system\)](https://www.qatar.tamu.edu/students/academic-services/aggie-honor-system/) website.*

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 office on your campus (resources listed below). 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.

Texas A&M at College Station

Disability Resources is located in the Student Services Building or at (979) 845-1637 or visit disability.tamu.edu [_ \(https://disability.tamu.edu/\)](https://disability.tamu.edu/).

Texas A&M at Galveston

Disability Resources is located in the Student Services Building or at (409) 740-4587 or visit [tamug.edu/counsel/Disabilities](https://www.tamug.edu/counsel/Disabilities) [\(https://www.tamug.edu/counsel/Disabilities.html\)](https://www.tamug.edu/counsel/Disabilities.html/).

Texas A&M at Qatar

Disability Services is located in the Engineering Building, room 318C or at +974.4423.0316 or visit <https://www.qatar.tamu.edu/students/student-affairs/disability-services>.

<https://www.qatar.tamu.edu/students/student-affairs/disability-services>)

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** <https://rules-saps.tamu.edu/PDFs/08.01.01.M1.pdf>):

- 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, a person who is subjected to the alleged conduct 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.

Texas A&M at College Station

*Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with **Counseling and Psychological Services** <https://caps.tamu.edu/> (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** <https://titleix.tamu.edu/>.*

Texas A&M at Galveston

*Students wishing to discuss concerns in a confidential setting are encouraged to make an appointment with the Counseling Office in the Seibel Student Center, or call (409)740-4587. For additional information, visit **tamug.edu/counsel** (<http://www.tamug.edu/counsel>).*

*Students can learn more about filing a report, accessing supportive resources, and navigating the Title IX investigation and resolution process on the Galveston Campus' **Title IX webpage** (<https://www.tamug.edu/hrd/Title%20IX.html>).*

Texas A&M at Qatar

Texas A&M University at Qatar students wishing to discuss concerns in a confidential setting are encouraged to visit the **Health and Wellness** [\(https://www.qatar.tamu.edu/students/student-affairs/health-and-wellness/\)](https://www.qatar.tamu.edu/students/student-affairs/health-and-wellness/) website for more information.

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** [\(https://titleix.tamu.edu/\)](https://titleix.tamu.edu/).

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 healthy self-care by utilizing available resources and services on your campus.

Texas A&M College Station

Students who need someone to talk to can contact **Counseling & Psychological Services** [\(https://caps.tamu.edu/\)](https://caps.tamu.edu/) (CAPS) or call the **TAMU Helpline** [\(https://caps.tamu.edu/helpline/\)](https://caps.tamu.edu/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** [\(https://suicidepreventionlifeline.org/\)](https://suicidepreventionlifeline.org/).

Texas A&M at Galveston

Students who need someone to talk to can call (409) 740-4736 from 8:00 a.m. to 5:00 p.m. weekdays or visit **tamug.edu/counsel** [\(https://www.tamug.edu/counsel/Disabilities.html\)](https://www.tamug.edu/counsel/Disabilities.html) for more information. For 24-hour emergency assistance during nights and weekends, contact the TAMUG Police Dept at (409) 740-4545. 24-hour emergency help is also available through the National Suicide Prevention Hotline (800-273-8255) or at **suicidepreventionlifeline.org** [\(https://suicidepreventionlifeline.org/\)](https://suicidepreventionlifeline.org/).

Texas A&M at Qatar

Texas A&M University at Qatar students wishing to discuss concerns in a confidential setting are encouraged to visit the **Health and Wellness** [\(https://www.qatar.tamu.edu/students/student-affairs/health-and-wellness/\)](https://www.qatar.tamu.edu/students/student-affairs/health-and-wellness/) website for more information.

Campus Specific Policies

Texas A&M at Galveston

Classroom Access and Inclusion Statement

Texas A&M University is committed to engaged student participation in all of its programs and courses and provides an accessible academic environment for all students. This means that our classrooms, our virtual spaces, our practices and our interactions are as inclusive as possible and we work to provide a

welcoming instructional climate and equal learning opportunities for everyone. If you have an instructional need, please notify me as soon as possible.

The Aggie Core values of respect, excellence, leadership, loyalty, integrity and selfless service in addition to civility, and the ability to listen and to observe others are the foundation of a welcoming instructional climate. Active, thoughtful and respectful participation in all aspects of the course supports a more inclusive classroom environment as well as [our](https://rules-saps.tamu.edu/PDFs/12.01.99.M2.pdf) [mutual](https://rules-saps.tamu.edu/PDFs/12.01.99.M2.pdf) [responsibilities](https://www.tamug.edu/studentrules/Students_Rights_Responsibilities.html) to the campus community.

The following statements below are optional. Leave as is to include, or delete if preferred. Either way, delete this note.

Statement on the Family Educational Rights and Privacy Act (FERPA)

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings. Currently enrolled students wishing to withhold any or all directory information items may do so by going to howdy.tamu.edu [\(https://howdy.tamu.edu/\)](https://howdy.tamu.edu/) and clicking on the "Directory Hold Information" link in the Student Records channel on the MyRecord tab. The complete [FERPA Notice to Students](http://registrar.tamu.edu/Catalogs%2C-Policies-Procedures/FERPA/FERPA-Notice-to-Students#0-StatementofRights) [Statement of Rights](http://registrar.tamu.edu/Catalogs%2C-Policies-Procedures/FERPA/FERPA-Notice-to-Students#0-StatementofRights) and the student records policy is available on the Office of the Registrar webpage.

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees honors and awards received, participation in officially recognized activities and sports, medical residence location and medical residence specialization.

COVID safety

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 healthy self-care by utilizing available resources and services on your campus.

To help protect Aggieland and stop the spread of COVID-19, Texas A&M University urges students to be vaccinated and to wear masks in classrooms and all other academic facilities on campus, including labs. Doing so exemplifies the Aggie Core Values of respect, leadership, integrity, and selfless service by putting community concerns above individual preferences. COVID-19 vaccines and masking — regardless of vaccination status — have been shown to be safe and effective at reducing spread to others, infection, hospitalization, and death.

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