



CSE 471: Intro to Artificial Intelligence (Fall 2023)

Warning: *This class is NOT for the faint-hearted*

- *If you are tested positive for COVID or have COVID symptoms, please refrain from attending the class physically until full recovery. Accommodations will be provided for the affected period if needed.*
- *Remote learning materials will be provided on Canvas (e.g., lecture recordings, slides, and assignments).*

Syllabus Disclaimer

The syllabus is a statement of intent and serves as an implicit agreement between the instructor and the student. Every effort will be made to avoid changing the course schedule but the possibility exists that unforeseen events will make syllabus changes necessary. Remember to check your ASU email and the course site often.

1. Course Description:

This course provides a first introduction to a myriad of topics in Artificial Intelligence. The focus of the course is the study of modern approaches to Artificial intelligence. In particular, we will study:

- **Problem solving** deals with general problem solving; techniques behind DeepBlue

and AlphaGo.

- **Probabilistic modeling and reasoning** deals with uncertain modeling and reasoning. Almost all real-world problems are subject to uncertainty.
- **Decision making under uncertainty** deals with problem solving and decision making under uncertainty.
- **Machine learning** deals with learning from examples and more advanced learning techniques that contribute to most modern AI applications.

2. Course Information:

Lecture:

MW 1:30–2:45 PM *PSH153*

Join URL: <https://asu.zoom.us/j/88086727154> (**Live Zoom Link** for remote learners)

Instructor: Yu (“Tony”) Zhang Email: yzhan442@asu.edu

Instructor Office Hours:

MW 3:00--4:00 PM <https://asu.zoom.us/j/4960882182>
(Waiting room enabled. Please be patient for your turn (if needed).)

TA: Akkamahadevi Hanni (Akku) ahanni@asu.edu

Office Hours for TA:

TuF 1:30-2:30 PM <https://asu.zoom.us/j/83492825705>

Graders:

Roshan Jacob Manoj rjacobma@asu.edu
TuTh 10:00-11:00AM <https://asu.zoom.us/j/3483884833>

Devaraj Madhugonda dmadhugo@asu.edu
Th 3:00--4:00 PM <https://asu.zoom.us/j/89694241426>
F 10:00--11:00AM

UGTA:

Yonatan Rosenbloom yrosenbl@asu.edu
MW 9:00-10:00AM <https://asu.zoom.us/j/6075945356>

Remarks on Electronic Communication: For questions regarding personal issues, email **BOTH** the instructor and TA(s) or visit us during our office hours. Before sending an email

please follow the excellent advice <http://www.wikihow.com/Email-a-Professor>. For questions about class materials (e.g., homework, quizzes and etc.), see the respective sections below.

Student Success

To be successful:

- check the course daily
- read announcements
- read and respond to course email messages as needed
- complete assignments by the due dates specified
- communicate regularly with your instructor and peers
- create a study and/or assignment schedule to stay on track
- access [ASU Student Resources](#)
- [review the Student Tips for Learning with Zoom, https://uto.asu.edu/zoom-learning](https://uto.asu.edu/zoom-learning)

3. Textbooks:

Required: Artificial Intelligence - A Modern Approach
Stuart Russell & Peter Norvig, 3rd Edition

- **Note:** The 2nd & 4th Edition can still be used. However, you might have to consult with your classmates regarding the mapping of homework problems and pages between the two editions.
- **Note:** International editions of the textbook have different numbering in the exercises. If you are using the international edition, you will have to consult with your classmates regarding the mapping of homework problems and pages between the 2 editions.

Recommended readings:

Probabilistic Robotics

Sebastian Thrun, Wolfram Burgard & Dieter Fox

Reinforcement Learning: An Introduction

Richard S. Sutton and Andrew G. Barto

Deep Learning

Ian Goodfellow, Yoshua Bengio & Aaron Courville

Free online version: <https://www.deeplearningbook.org>

Supplementary readings: will be announced on Canvas when available.

4. Resources

Course web page

<http://www.public.asu.edu/~yzhan442/teaching/CSE471-F23/>

Schedule (A rough schedule; subject to change):

<http://www.public.asu.edu/~yzhan442/teaching/CSE471-F23/schedule.html>

On-line discussions and polls (Ed Discussion, integrated with Canvas):

Course Canvas page >> Ed Discussion (left panel)

Recorded lectures (generally available a few hours after lecture):

Course Canvas page >> Zoom (left panel) >> Cloud Recordings

Class materials (syllabus, slides, homework, and project):

Course Canvas page >> Files (left panel)

Quiz:

Course Canvas page >> Quizzes (left panel)

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NOTES about assignments in our class (more details to follow):

All assignments (homework and projects) in this class are *individual* assignments only. **NO collaborative problem solving or assignment study groups**; however, high-level discussion is encouraged without going into the details.

Use of ChatGPT or similar tools is allowed. However, you must **clearly explain what it was used for in the assignment AND it should not have led you to being flagged as plagiarism.**

DON'T use Canvas messages. ***DON'T*** use emails for technical questions; use Ed Discussion instead. For non-technical questions, post private messages on Ad Discussion or email (addressing both the instructor and TA).

If you must miss a homework/project for reasons beyond your control, notify us ASAP and ***no later than*** the original assignment due date with the

following information:

- 1) *the extension needed.*
- 2) *verifiable documents* (if available at the time otherwise must be submitted *within 7 days* of the original assignment due date).

The documents must state the affected period that supports the extension requested.

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General policy for assignments:

- If homework/project is turned in late and *within 48 hours of the deadline*, the maximum grade you can expect is **50%** of the total grade; if you do submit a late homework/project, you need to email (addressing both the instructor and the TA) and submit the assignment to Canvas within 48 hours of the original deadline; *no credits will be given after 48 hours.*
- If you are stuck, first consult/review the recorded lectures, textbook, handouts, and notes to attempt your own solutions. If you are still stuck afterwards, you may post questions on Ed Discussion (about where you are stuck) under the most relevant topic, consult online resources that help you understand the technical approaches or visit the instructor or TA(s) during office hours. **DON'T** “borrow” assignment solutions from others, provide solutions to others, or consult solution manuals (including pseudocode for programming assignments).
- If you find yourself unable to start after consulting the recorded lectures, textbook, handouts, and notes, visit the instructor or TA(s) during office hours.
- If you cannot come up with satisfactory and complete solutions to homework/project, submit your attempted solutions.
- In some cases, the instructor or the TA may send you additional questions or ask you to clarify your solutions. If you get such a message, you must respond *within 2 calendar days.*
- If cheating/plagiarism is detected, then the *homework/project score will be zero AND your final grade will be penalized AND you may be reported.* For the *K*th offense, your final grade will be penalized by *5K* (e.g., two offenses will result in a total of 15pt penalty). Note that the offense count accrues over project and homework. The only fail-safe way to avoid being flagged is to **develop your own solutions from scratch!**
- For questions posted on Ed Discussion, the TA(s) and me will be responding *after 1 calendar day.* If you plan to rely on our answers, make sure to plan ahead. This will let your classmates enough time to attempt to answer your questions for class

participation credit.

5. Homework:

Homework problems will be posted on Canvas. Submission of homework is done **electronically** via Canvas before the deadline. **Single PDF** file submission (unless noted otherwise):

- 1) Only **TYPED** homework will be accepted; submission with **ANY** hand-written solutions (except for figures, see below) will be rejected (i.e., considered as no-submission for grading purposes).
- 2) For any solution, you must **SHOW STEPS** in your own language. An answer without steps or sufficient explanations will **NOT** be given any credits.
- 3) **DON'T** include questions themselves in your submissions. Doing so may trigger the plagiarism flag.
- 4) Plagiarism will be checked, penalized and reported (see general policy for assignments).

You may hand-draw pictures to explain your solutions and incorporate them into the PDF if necessary. You are suggested to use [Overleaf](#) or Microsoft Word to typeset your homework. Homework problem solutions are to be provided on Canvas after the due date.

The homework with the lowest score will be dropped. However, homework with plagiarism will **NOT** be dropped.

6. Exams and quizzes:

There will frequently be quizzes during the semester for the materials covered in the previous classes (focusing on the last 1-2 lectures). Quizzes do **NOT** count towards your final grade. They are made available to monitor your learning outcomes by yourself. ***Quiz solutions will be available after you have taken the quiz.***

The final exam will be composed of two parts: 1) written (in class); 2) coding (take home). Both will be timed. ***The question format of the written part will be similar to quizzes and the coding part will be similar to your individual projects.***

7. Individual projects:

- Coding based project that is composed of multiple parts covering various topics throughout the class.
- These are *individual* projects. Plagiarism will be checked; do not bet on your luck. Your code will be compared among all those who have ever submitted the programming project plus numerous online resources. Detection of copied or isomorphic code will be automatically performed.
- We rely on automatic systems for plagiarism check, which may lead to false positives. In such cases (which are rare), the student is responsible to prove it

otherwise.

- The individual project with the lowest score will be dropped. However, project with plagiarism will **NOT** be dropped.

8. Grading Questions:

If you believe that there is a mistake in grading, you must email BOTH the TA(s) and the instructor **within 2 calendar days** when the graded work was returned to you. Then, **discuss with your TA(s) first** in their office hours. If the grading issue cannot be resolved with your TA(s), your TA(s) will discuss with your instructor. Alternatively, your TA(s) may also direct you to discuss directly with your instructor.

Canvas automatically computes some overall grades, which are **NOT** accurate. We will manually compute your overall grades (including the letter grade) outside of canvas with many exceptions considered. For how we compute your overall grades, see the following.

9. Participation Credits (Extra Credits):

- 1 extra credit for online (Ed Discussion), 1 extra credit for in-class participation (in-class participation is **NOT** about whether you show up or not but how you participate in the class discussion, office hours, etc.), and 1 extra credit for the end-of-semester survey.
- Contributing to both on-line and in-class discussions. This should be an activity throughout the semester.
- Correcting your instructor and/or TA(s) in class!
- Helping others figure out fallacies in their line of thought when attempting to solve a problem.
- Giving hints to your classmates, **not the answer!**

9. Grading:

Homework	25%
Individual projects	45%
Quizzes	0%
Final	30%
Participation	3%
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Total	103%

All assignments within the same class will be weighted equally unless noted otherwise.

Final grades will be determined as follows:

A+ [100-103]

A	[93-100)
A-	[90-93)
B+	[85-90)
B	[80-85)
B-	[75-80)
C+	[70-75)
C	[65-70)
D	[60-65)
E	[0-60)

The instructor reserves the rights to curve if necessary.

Late or Missed Submissions under Special Situations

Follow the appropriate University policies to request an [accommodation for religious practices](#) or to accommodate a missed assignment [due to University-sanctioned activities](#).

Communicating with the Instructor

Community Forum (Ed Discussion)

This course uses a discussion topic called "Community Forum" via Ed Discussion for technical questions and comments about the course. Prior to posting a question or comment, check the syllabus, announcements, and existing posts to ensure it's not redundant. You are encouraged to respond to the questions of your classmates, which will earn you extra credits. When posting answers/questions, do **NOT** post 1) code (*including pseudocode*), 2) your solutions, 3) online solutions or links to online solutions (including pseudocode).

Email questions of a personal nature to your instructor/TA. You can expect a response within 48 hours. You can also visit us during our office hours.

Chat

You may use the ASU Slack channel for communicating with other students. However, please note that Slack is not monitored by the course team. For discussion of assignments on Slack, the policy is the same with Ed Discussion: *collaborative learning is encouraged, not collaborative assignment* (see general policy for assignments). We reserve the rights to incur penalty if inappropriate behavior is observed.

Email

ASU email is an [official means of communication](#) among students, faculty, and staff. Students are expected to read and act upon email in a timely fashion. Students bear the responsibility of missed messages and should check their ASU-assigned email regularly.

All instructor correspondence will be sent to your ASU email account.

ASU Sync Option and Remote Learning

In the case that you cannot attend our class in-person for certain reasons (e.g., COVID concerns), ASU sync option will be available (Live Zoom Lecture link provided earlier). Remote learning materials such as lecture recordings will also be provided (info for accessing recorded lectures provided earlier).

ASU Sync is a technology-enhanced approach designed to meet the dynamic needs of the class. During Sync classes, students learn remotely through live class lectures, discussions, study groups and/or tutoring. You can find out more information about ASU Sync for students here, <https://provost.asu.edu/sync/students> and <https://www.asu.edu/about/fall-2021>.

Your ASU courses can be accessed by both my.asu.edu and myasucourses.asu.edu; bookmark both in the event that one site is down.

To access live sessions of this class, go to myASU and click on the canvas link of the class. Once you are in the canvas page of the class, click on the zoom link on the left panel. You should now be directed to a list of recordings and scheduled classes.

Technology Requirements for ASU Sync Option and Remote Learning

ASU Sync classes can be live streamed anywhere with the proper technology. We encourage you to use a PC or Apple laptop or desktop equipped with *a built-in or standalone webcam*. You will need an internet connection that can effectively stream live broadcasts. It is recommended that your internet download speed is at least 5.0 mbps. You can use this [tool to test your current connection](#).

Additional Requirements:

This course requires the following technologies:

- Web browsers ([Chrome](#), [Mozilla Firefox](#), or [Safari](#))
- [Adobe Acrobat Reader](#) (free)
- [Adobe Flash Player](#) (free)
- Webcam, microphone, headset/earbuds, and speaker
- Microsoft Office or typesetting tools such as LaTeX ([Microsoft 365 is free](#) for all currently-enrolled ASU students).

- Reliable broadband internet connection (DSL or cable) to stream videos.

11. Honors Contract:

For honors project, the students must decide their own topic and then email the instructor for approval. Once approved, you can start working on the project. A few ideas include:

1. Extend one of the class projects. Just a few ideas here: making teleporting ghosts, improving the algorithms learned in class with evaluation, and implementing competing methods to methods learned in class with comparison.
2. Read 2-3 recent papers on topics that we cover in class
3. Implement algorithms learned in class on physical platforms
4. Propose your own project idea
5. You may also ask the instructor for ideas, which will be more challenging than your own ☺

You will also need to submit a 2-page report to explain your effort along with your implementation by the end of the semester.

12. Attendance:

I do not have an attendance policy. Come to class only if you like. All materials will be available online.

However, if you skip classes, **you do miss the chance for in-class participation bonus AND may inadvertently miss quizzes.**

Note that class sessions will be recorded, and recordings provided to enrolled students, instructors or instructional support personnel. If you have concerns about being recorded, please contact the course instructor. Recordings of all class sessions will be posted in Canvas for all students to access for reviewing course materials.

13. Class evaluations and feedback:

I take very seriously class evaluations and feedback. During the semester, **I may post surveys on Ed Discussion** for feedback on both the course organization and the course content. I will appreciate it if you respond to these surveys. Ideally, the changes I implement will help you better succeed in the course.

Finally, it is **extremely important** that you respond to the final anonymous survey solicited by the university at the end of the school year. The overall feedback helps me make changes for the next year. The survey is often released 1-2 weeks before the final at:

<https://fultonapps.asu.edu/eval/>

14. Academic Dishonesty:

- Your work for this course must be the result of your own individual effort. Besides class materials such as our textbook and recorded lectures, you are allowed to consult online resources and others to discuss the technical approaches (if you did not fully understand the technical approaches covered in the book and lectures) to help derive your own solutions. In addition, you can discuss assignment problems with your instructor and TA(s). **However, please do not expect that we will directly give you the solutions!**
- Copying (or slightly changing) solutions from online sources and/or your friends is **easily detectable**. Students who provide solutions to others will be treated in the same way as students who copy from others.
- Do not forget that if you can find an answer online, so can we! Actually, the automatic plagiarism-checking system will have many different versions of solutions to check against your answers for copying.

15. Disability Accommodations.

For convenience, we provide enough time for assignments (except for the final exam) that is considered sufficient for everyone so we would not explicitly set up different deadlines for disability accommodation. Students may contact the instructor and TA(s) in case additional time is needed. In such cases, you must first register with DRC/SAILS:

Suitable accommodations are made for students having disabilities. Students needing accommodations must register with the ASU Disabilities Resource Center and provide documentation of that registration to the instructor. Students should communicate the need for an accommodation in enough time for it to be properly arranged. See ACD 304-08 Classroom and Testing Accommodations for Students with Disabilities.

Students who feel they will need disability accommodations in this class but have not registered with Student Accessibility and Inclusive Learning Services or SAILS (formerly known as the Disability Resource Center (DRC)) should contact SAILS immediately. Should you have additional questions, you may also contact Student SAILS directly by emailing Student.Accessibility@asu.edu or by calling (480) 965-1234. For additional information, visit: <https://eoss.asu.edu/accessibility>

16. Harassment and Sexual Discrimination

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits discrimination, harassment, and retaliation by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at <https://sexualviolenceprevention.asu.edu/faqs>.

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, <https://eoss.asu.edu/counseling> is available if you wish to discuss any concerns confidentially and privately. ASU online students may access 360 Life Services, <https://goto.asuonline.asu.edu/success/online-resources.html>.

Arizona State University is committed to providing an environment free of discrimination, harassment, or retaliation for the entire university community, including all students, faculty members, staff employees, and guests. ASU expressly prohibits [discrimination](#), [harassment](#), and [retaliation](#) by employees, students, contractors, or agents of the university based on any protected status: race, color, religion, sex, national origin, age, disability, veteran status, sexual orientation, gender identity, and genetic information.

17. Policy against threatening behavior, per the Student Services Manual, SSM 104–02

Students, faculty, staff, and other individuals do not have an unqualified right of access to university grounds, property, or services (see SSM 104-02). Interfering with the peaceful conduct of university-related business or activities or remaining on campus grounds after a request to leave may be considered a crime. All incidents and allegations of violent or threatening conduct by an ASU student (whether on- or off-campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students.

All incidents and allegations of violent or threatening conduct by an ASU student (whether on-or off campus) must be reported to the ASU Police Department (ASU PD) and the Office of the Dean of Students. If either office determines that the behavior poses or has posed a serious threat to personal safety or to the welfare of the campus, the student will not be permitted to return to campus or reside in any ASU residence hall until an appropriate threat assessment has been completed and, if necessary, conditions for return are imposed. ASU PD, the Office of the Dean of Students, and other appropriate offices will coordinate the assessment in light of the relevant circumstances. For more information please visit <https://eoss.asu.edu/dos/srr/PoliciesAndProcedures> and <https://eoss.asu.edu/dos/safety/ThreateningBehavior>.

18. Academic Integrity and Copyright Laws

Students in this class must adhere to ASU's academic integrity policy, which can be found at <https://provost.asu.edu/academic-integrity/policy>). Students are responsible for reviewing this policy and understanding each of the areas in which academic dishonesty can occur. In addition, all engineering students are expected to adhere to both the ASU Academic Integrity Honor Code and the Fulton Schools of Engineering Honor Code. All academic integrity violations will be reported to the Fulton Schools of Engineering Academic Integrity Office (AIO). The AIO maintains record of all violations and has access to academic integrity violations committed in all other ASU college/schools.

Specific academic integrity rules for this class are discussed in earlier sections.

Copyright

Course content, including lectures, are copyrighted materials and students may not share outside the class, upload to online websites not approved by the instructor, sell, or distribute course content or notes taken during the conduct of the course (see ACD 304-06, "Commercial Note Taking Services" and ABOR Policy 5-308 F.14 for more information).

You must refrain from uploading to any course shell, discussion board, or website used by the course instructor or other course forum, material that is not the student's original work, unless the students first comply with all applicable copyright laws; faculty members reserve the right to delete materials on the grounds of suspected copyright infringement.

19. Warning of Offensive Class Materials

When some course content may be deemed offensive by some students, warning may be given. In case of ignorance of such situations, the affected students may directly contact the instructor to have them removed or replaced.

20. Absent Instructor

In the event the instructor fails to indicate a time obligation, the time obligation will be 15 minutes for class sessions lasting 90 minutes or less, and 30 minutes for class sessions lasting more than 90 minutes. Students may be directed to wait longer by someone from the academic unit if they know the instructor will arrive shortly.