



## CSE 571: Artificial Intelligence (Spring 2024)

**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:

T TH            12:00–1:15 PM                            *Tempe - PSF101*

**Instructor:**    Yu (“Tony”) Zhang                            Email: [yzhan442@asu.edu](mailto:yzhan442@asu.edu)

**TA:**                Akkamahadevi Hanni (Akku)                    Email: [ahanni@asu.edu](mailto:ahanni@asu.edu)

**Grader:**         Devaraj Madhugondu                            Email: [dmadhugo@asu.edu](mailto:dmadhugo@asu.edu)

Lecture live zoom link: <https://asu.zoom.us/j/89044406660>

### Instructor Office Hours:

T TH            1:45--2:45 PM (virtual)                            <https://asu.zoom.us/j/4960882182>

### TA Office Hours:

TBD            TBD    TBD

### Grader Office Hours:

TBD            TBD    TBD

**Remarks on Electronic Communication:** For questions regarding personal issues, email **BOTH** the TA(s) and me or attend our office hours to discuss. Do NOT use Canvas messages, which will be ignored. 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, such as announcements and due dates
- read announcements carefully

- read and respond to course email messages as needed
- complete assignments by the due dates specified
- communicate regularly with your instructor and peers in class and/or online
- create a study and/or assignment schedule to stay on track
- access [ASU Student Resources](#)
- To prepare for situations when ASU sync and/or remote learning is required, review the Student Tips for Learning with Zoom, <https://uto.asu.edu/zoom-learning>

### 3. Textbooks:

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

- **Note:** The 2nd 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 and via course website.

### 4. Resources

**Course web page**

<http://www.public.asu.edu/~yzhan442/teaching/CSE571-S24/>

**Schedule (A rough schedule; subject to change):**

<http://www.public.asu.edu/~yzhan442/teaching/CSE571-S24/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, except team project, in this class are *individual* assignments only. **NO collaborative problem solving or assignment study groups, except for the team project**; however, high-level discussion is encouraged without going into the details.

Use of ChatGPT or similar tools is allowed. However, you must 1) accept the risk that your work may be flagged as plagiarism (since ChatGPT or similar tools is trained with online data, which may be solutions to the assignment by other people); and 2) **clearly explain how it was used for in the assignment (as comments in code submission or notes in homework submissions)**

***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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### 5. Homework:

Homework problems will be posted on Canvas. Submission of homework is done **electronically** via Canvas before the deadline (specified by date **AND** time). **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) **Do NOT include questions themselves in your submissions. Doing so may trigger the plagiarism flag.**
- 4) *Plagiarism will be checked, penalized and reported.*

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.

#### General policy:

- 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 send BOTH the instructor and the TA(s) an email **AND** submit the assignment to Canvas within 48 hours of the original deadline; **no credits will be given after 48 hours**. [Only under extremely rare situations will exceptions be made. Make sure to plan ahead.]
- 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** (*NOT* the assignment solutions from others, including the book publisher), or visit the instructor or TA(s) during office hours. **However, AT NO POINT OF TIME should you ask for (from others) OR provide (to others) solutions to homework problems, or copy/consult online solutions.**
- 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 (e.g., consulting/copying others' or online solutions), 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  $2.5K$  (e.g., two offenses will result in a total of 7.5pt penalty). **Note that the offense count accrues over quiz, project, and homework.**
  - 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.

## 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 with the lowest score will be dropped. However, quiz with plagiarism will NOT be dropped.** If you miss the quiz due to reasons outside of your control (e.g., an emergency), you must inform the instructor and the TAs before or within **24 hours** of the class in which the quiz is published. *After 24 hours, we will not consider any request to retake the quiz.*

*Quiz group in any form is strictly prohibited. Violators will be treated the same as plagiarism violators, penalized, and may be reported* (see general policy for assignments).

*There will also be a final exam for the class.*

## 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 online resources. Detection of copied or isomorphic code will be automatically performed.
- **If cheating is detected, that projection assignment score will be zero AND you will get an additional 2.5pt off your final grade AND you may be reported** (see general policy for assignments).
- **We rely on automatic systems for plagiarism check, which may lead to false positives. In such cases (which are extremely 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.**

## 9. Team projects:

- An applied project that tests how you can apply the knowledge that you learn to solve real problems. You may choose from a list of given projects or propose your own project. This is a team project with a maximum of 4 people.
- Team project topics will be released approximately 1.5 months before the final's week
- If you wish to work on your own project topic: 1) the topic must be related to the course materials covered; 2) you must talk to your instructor to get approval.

## 10. 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.

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

## 11. Participation Credits (Extra Credits):

- **1 extra credit for online (Piazza), 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.

## 12. Grading:

Homework	20%
Individual projects	25%
Quizzes	10%

Team project	20%
Final	25%
Participation	3%
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Total	103%

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 Urgent Situations

Notify the instructor and TA(s) (via emails) **BEFORE** an assignment is due if an urgent situation arises and you are unable to submit the assignment on time. Attach **VERIFIABLE** documentation (that clearly states the type and duration of the urgency) with your request as early as you can after the situation.

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 (Piazza)

This course uses a discussion topic called "Community Forum" via Piazza 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, 2) your solutions, 3) online solutions.

Email questions of a personal nature to your instructor/TA. You can expect a response within 48 hours.



## Chat

You may use the ASU Slack channel for communicating with other students. However, please note that Slack is not constantly monitored by the course team. For discussion of assignments on Slack, the policy is the same with Piazza: collaborative learning is encouraged, not collaborative assignment. 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 valid reasons (e.g., COVID concerns), ASU sync option may be provided if possible. Remote learning materials such as lecture recordings will also be provided.

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](http://my.asu.edu) and [myasucourses.asu.edu](http://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. Project Portfolio:

For MS project portfolio, the student must submit additional work in addition to their team project to satisfy the requirement (roughly 50% more on top of what you did for the team project). The student must propose what more to do on top of their team project and submit the final project portfolio document (built upon their team project report) within 2 weeks after class finishes. The additional work should be clearly marked in the final report.

## 13. 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.

## 14. 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/>

## 15. 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.

## 16. 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](mailto:Student.Accessibility@asu.edu) or by calling (480) 965-1234. For additional information, visit: <https://eoss.asu.edu/accessibility>

## **17. 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.

## **18. 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>.

## **19. 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.

## **20. 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.

## **21. 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.