

# CSE 3521 (2021 Fall)

## Survey of Artificial Intelligence I: Basic Techniques

<b>Instructor:</b>	Shuaichen Chang
<b>Email:</b>	Chang.1692@osu.edu
<b>Office hour:</b>	TBA

<b>Class time:</b>	Monday, Wednesday, and Friday, 11:30 PM - 12:25 PM
<b>Classroom:</b>	Caldwell Lab 177
<b>Course website:</b>	<a href="https://shuaichenchang.github.io/teaching/CSE3521_au22.html">https://shuaichenchang.github.io/teaching/CSE3521_au22.html</a>
<b>Piazza:</b>	<a href="https://www.piazza.com/osu/autumn2022/cse3521">https://www.piazza.com/osu/autumn2022/cse3521</a>

<b>Course abstract:</b>	Survey of basic concepts and techniques in artificial intelligence, including problem-solving, knowledge representation, and machine learning.
<b>Course objectives:</b>	<ul style="list-style-type: none"><li>• Be familiar with basic search techniques for problem-solving.</li><li>• Be exposed to multiple knowledge-representation formalisms.</li><li>• Be familiar with data and feature representations.</li><li>• Mastery of basic unsupervised learning techniques and the kinds of problems they solve.</li><li>• Mastery of basic supervised learning techniques and the kinds of problems they solve.</li><li>• Be exposed to the ethics of AI.</li></ul>
<b>Pre-requisites:</b>	<p>Required background:</p> <ul style="list-style-type: none"><li>• CSE 2331 (Foundations 2) or 5331</li><li>• Linear algebra: Math 2568, 2174, 4568, or 5520H</li><li>• Statistics and probability: Stat 3201 or 3450 or 3460 or 3470 or 4201 or Math 4530 or 5530H</li></ul> <p>Students in the class are expected to have a reasonable degree of mathematical sophistication, and to be familiar with the basic knowledge of linear algebra, multivariate calculus, probability and statistics. Students are also expected to have knowledge of basic algorithm design techniques and basic data structures.</p> <p>Programming in Python is required.</p>

<b>Required Textbook:</b>	No required textbook
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<b>Suggested references:</b>	<p>Stuart Russell and Peter Norvig, Artificial intelligence: a modern approach (3rd edition). Pearson, 2010</p> <p>Christopher M Bishop, Pattern recognition and machine learning. Springer, 2006.</p> <p>Kevin P. Murphy, Machine Learning: A Probabilistic Perspective. The MIT press, 2012</p> <p><b>Other suggested:</b>            Shai Shalev-Shwartz and Shai Ben-David, Understanding machine learning: From theory to algorithms. Cambridge university press, 2014.</p> <p>Ian Goodfellow, Yoshua Bengio, and Aaron Courville, Deep learning. MIT press, 2016.</p> <p>Ethem Alpaydin, Introduction to Machine Learning. The MIT press.</p> <p><b>Useful references:</b>            Kaare Brandt Petersen and Michael Syskind Pedersen, The Matrix Cookbook</p>
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Weekly schedule: see

[https://docs.google.com/spreadsheets/d/1EcoX1f4mtT\\_2Ssodc6XkV4NTKZEsw7kl5OXibCeaMXI/edit?usp=sharing](https://docs.google.com/spreadsheets/d/1EcoX1f4mtT_2Ssodc6XkV4NTKZEsw7kl5OXibCeaMXI/edit?usp=sharing)

<b>Grading: (tentative)</b>	(percentage)
Participation:	10%
Homework:	40%
Midterm exam:	25%
Final exam: (12/14, 2:00pm-3:45pm, ET)	25%

<b>Homework:</b>	<ul style="list-style-type: none"> <li>• There will be 4 homework assignments.</li> <li>• Each assignment will include a problem set and a programming set.</li> <li>• Programming in Python 3 is required.</li> <li>• Carmen (and other platforms like GitHub or Google Colab) will be used for submission.</li> <li>• You must strictly follow the homework and submission instructions.</li> </ul>
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	<ul style="list-style-type: none"> <li>For the problem set and report of the programming set, we may only allow pdf online submission.</li> </ul>
<b>Quiz &amp; participation:</b>	We will use Carmen quizzes.
<b>Midterm exam &amp; final exam:</b>	The midterm and final exams may be in person, or online via Carmen quizzes and Carmen Zoom.
<b>Announcements, communications, and discussions:</b>	<ul style="list-style-type: none"> <li>We will make announcements using the Carmen website or Piazza. Announcements of urgent matters will be mailed to your name.#@osu.edu address. If you do not regularly read that account, make sure you forward it to somewhere that does.</li> <li>We will use Piazza or Carmen for discussions. If you have questions about the course materials or policy, please also post them on these platforms. I will also monitor these discussions and answer as appropriate, but students should feel free to use the forums to have group discussions as well.</li> <li>Please only use email to contact the instructor for urgent or personal issues. Any e-mails sent to the instructor or TA should include the tag "[OSU-CSE-3521]" in the subject line. (This ensures we can filter and prioritize your messages.) We reserve the right to forward any questions (and their answers) to the entire class if they should prove relevant. Please indicate if you wish to be anonymized (i.e. have your name removed) in this case.</li> </ul>

<b>Policy and further information</b>	
<b>Homework:</b>	<ul style="list-style-type: none"> <li>There are NO late days for homework assignments.</li> <li>Homework should be neat and professional and follow the required format. Homework on torn sheets, scrap paper, or not well scanned into a single file will not be accepted.</li> <li>Homework is to be done individually. Of course, discussion between students is allowed and encouraged, but the actual homework should be completed separately. You must list with whom you discussed.</li> <li>Questions about homework or exams should be made in a timely fashion. Any complaints about homework grading must be made within 1-week of when the item is returned. Do not wait until the end of the semester!</li> </ul>
<b>Exams:</b>	<ul style="list-style-type: none"> <li>Excuse from scheduled exams can be accepted only in case of personal sickness requiring medical care or severe accidents in the immediate family (documentation required).</li> </ul>

## **Proctorio**

Proctorio, an online proctoring tool, might be used during this course. Proctorio offers you flexibility to take your exams at the time and in the location of your choosing. Students are required to have a webcam (USB or internal) with a microphone and a strong and stable internet connection. During the course of an exam, Proctorio will record the testing environment, therefore students should select private spaces for the exam session where disruptions are unlikely and where recording devices can be enabled. Instructions for Proctorio use will be provided. To consent to use Proctorio you must be over 18 years of age. Students under 18 can use Proctorio if their parent and or legal guardian submitted the waiver included in their OSU Academy Orientation. Additionally, the tool has limitations in its accessibility for students reliant upon screen readers and keyboard navigation. If you have concerns about using an online proctoring tool for the reasons listed above or in general, please work with your instructor to find an equivalent alternative. Additional information on academic integrity at Ohio State and recommended proctoring options are available.

\*You need to use Chrome and have a camera, microphone, laptop or desktop, and good internet for taking the exam using Proctorio.

## **Carmen access:**

You will need to use BuckeyePass multi-factor authentication to access your courses in Carmen. To ensure that you are able to connect to Carmen at all times, it is recommended that you take the following steps:

- Register multiple devices in case something happens to your primary device. Visit the BuckeyePass - Adding a Device help article for step-by-step instructions.
- Request passcodes to keep as a backup authentication option. When you see the Duo login screen on your computer, click Enter a Passcode and then click the Text me new codes button that appears. This will text you ten passcodes good for 365 days that can each be used once.
- Download the Duo Mobile application to all of your registered devices for the ability to generate one-time codes in the event that you lose cell, data, or Wi-Fi service.
- If none of these options will meet the needs of your situation, you can contact the IT Service Desk at 614-688-4357 (HELP) and IT support staff will work out a solution with you.

## **Course Technology Resources:**

For help with your password, university email, Carmen, or any other technology issues, questions, or requests, contact the Ohio State IT Service Desk. Standard support hours are available at [ocio.osu.edu/help/hours](https://ocio.osu.edu/help/hours), and support for urgent issues is available 24/7.

- Self-Service and Chat support: [ocio.osu.edu/help](https://ocio.osu.edu/help)
- Phone: 614-688-4357(HELP)
- Email: [servicedesk@osu.edu](mailto:servicedesk@osu.edu)
- TDD: 614-688-8743

## **Baseline technical skills for online courses**

- Basic computer and web-browsing skills
- Navigating Carmen: for questions about specific functionality, see the Canvas Student Guide.

### Required equipment

- Computer: current Mac (OS X) or PC (Windows 7+) with high-speed internet connection
- Webcam: built-in or external webcam, fully installed and tested
- Microphone: built-in laptop or tablet mic or external microphone
- Other: a mobile device (smartphone or tablet) or landline to use for BuckeyePass authentication

### Copyright disclaimer:

The materials used in connection with this course may be subject to copyright protection and are only for the use of students officially enrolled in the course for the educational purposes associated with the course. Copyright law must be considered before copying, retaining, or disseminating materials outside of the course.

### Statement on academic misconduct and integrity policy:

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the university's Code of Student Conduct, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the university's Code of Student Conduct and this syllabus may constitute "Academic Misconduct."

The Ohio State University's Code of Student Conduct (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the university or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the university's Code of Student Conduct is never considered an excuse for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic misconduct.

You should note that you are not allowed to, among other things, (a) knowingly provide or receive information during exams, (b) knowingly provide or receive assistance on homework (except for discussions) unless I say it's OK, and (c) submit plagiarized (copied but unacknowledged) work for credit.

**If I suspect that a student has committed academic misconduct in this course, I am obligated by** university rules to report my suspicions to the Committee on Academic Misconduct (Faculty Rule 3335-5-487). It is the responsibility of the Committee on Academic Misconduct to investigate or establish procedures for the investigation of all reported cases of student academic misconduct. If COAM determines that you have violated the university's Code of Student Conduct (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the university. If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) to which you can refer include:

- The Committee on Academic Misconduct web pages (COAM Home)
- Ten Suggestions for Preserving Academic Integrity (Ten Suggestions)
- Eight Cardinal Rules of Academic Integrity ([www.northwestern.edu/uacc/8cards.htm](http://www.northwestern.edu/uacc/8cards.htm))

**Statement about disability services:**

Students with disabilities (including mental health, chronic or temporary medical conditions) that have been certified by the Office of Student Life Disability Services will be appropriately accommodated and should inform the instructor as soon as possible of their needs. The Office of Student Life Disability Services is located in 098 Baker Hall, 113 W. 12th Avenue; telephone 614- 292-3307, [slds@osu.edu](mailto:slds@osu.edu); [slds.osu.edu](http://slds.osu.edu)

**Health and safety requirements:**

All students, faculty and staff are required to comply with and stay up to date on all university safety and health guidance (<https://safeandhealthy.osu.edu>), which includes wearing a face mask in any indoor space and maintaining a safe physical distance at all times. Non-compliance will be warned first and disciplinary actions will be taken for repeated offenses.

**Requesting COVID-related accommodations:**

The university strives to make all learning experiences as accessible as possible. In light of the current pandemic, students seeking to request COVID-related accommodations may do so through the university's request process, managed by Student Life Disability Services. If you anticipate or experience academic barriers based on your disability (including mental health, chronic, or temporary medical conditions), please let me know immediately so that we can privately discuss options. To establish reasonable accommodations, I may request that you register with Student Life Disability Services. After registration, make arrangements with me as soon as possible to discuss your accommodations so that they may be implemented in a timely fashion. SLDS contact information: [slds@osu.edu](mailto:slds@osu.edu); 614-292-3307; [slds.osu.edu](http://slds.osu.edu); 098 Baker Hall, 113 W. 12th Avenue.

**Statement on Title IX:**

All students and employees at Ohio State have the right to work and learn in an environment free from harassment and discrimination based on sex or gender, and the university can arrange interim measures, provide support resources, and explain investigation options, including referral to confidential resources.

If you or someone you know has been harassed or discriminated against based on your sex or gender, including sexual harassment, sexual assault, relationship violence, stalking, or sexual exploitation, you may find information about your rights and options at [titleix.osu.edu](http://titleix.osu.edu) or by contacting the Ohio State Title IX Coordinator at [titleix@osu.edu](mailto:titleix@osu.edu). Title IX is part of the Office of Institutional Equity (OIE) at Ohio State, which responds to all bias-motivated incidents of harassment and discrimination, such as race, religion, national origin and disability. For more information on OIE, visit [equity.osu.edu](http://equity.osu.edu) or email [equity@osu.edu](mailto:equity@osu.edu).