

CSCI 431: Introduction to Artificial Intelligence

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Meetings	MWF 2:00-2:50 in Thompson 409. The final will be on Friday, May 3rd at 4:00.	
Course Description	<p><i>Artificial Intelligence</i>. The term conjures images of science fiction stories; of dystopian worlds with evil robot overlords, or beneficent android companions who will help us as society evolves.</p> <p>However state-of-the-art AI is a little less dramatic—but no less game changing. AIs that will profoundly alter life are already here, from automated vehicles to chatbots to algorithms and machines that will eliminate millions of jobs. Many tasks are considered to be AI, such as recommending a video or book that you’ll like, predicting whether or not you’re a terrorist from your cell phone records, and data-mining your social network accounts to determine your insurance premiums.</p> <p>We will be using the Python programming language, which is a high-level language like Java. Your first job is to master this language. The class will start with basic search techniques, but by the end will delve into deep neural networks using Google’s TensorFlow library.</p>	
Topics Covered (“Learning Outcomes”)	By the end of this class, you will understand, be able to implement, and use in programs:	
	<ul style="list-style-type: none">• The Python language.• Search algorithms.• Playing games using antagonistic search.• Machine learning & data mining.• Deep neural networks.• Clustering methods.• Knowledge representation.• Basic natural language processing.	
Web Page	The class web page is located at https://cs.pugetsound.edu/~aasmith/cs431/ . Valuable info and links are posted there.	
Text	The text we will use is “Hands-On Machine Learning with Scikit-Learn, Keras & TensorFlow” by Aurélien Géron. This is not a traditional textbook, but a reference you can use after you graduate.	
Prerequisites	The prerequisites for this class are CSCI 361 (“Algorithms and Data Structures”) and MATH 180 (“Calculus and Analytic Geometry I”), or their equivalents. If you have not taken these classes, please see me ASAP.	
Course Policies	There will be five assignments over the course of the class—one every two or three weeks. They will be in Python, and they must function with any code I provide. The assignments are listed on the class web page. You are free to talk to others in the class about them, but I expect what you finally turn in to be <i>100% your own work</i> . Assignments will be penalized by 20% for each working day (or fraction thereof) they are late, down to 40%. However, you will have three “extension days” during the semester to extend a deadline by one working day. They will be used automatically, unless you specify otherwise.	

There will also be a final project, in which you will explore some area of the class more deeply. You may work in pairs for this if you wish, but expectations will be substantially higher.

Use of telephones is forbidden in class. Laptops or tablets may be used only in ways directly relevant to the material. Anyone violating these rules will be asked to leave.

You all should be aware of the Honor Code at the college. Please do not cheat—it will not go well for you. It is forbidden to use bots such as ChatGPT. If you use an online source for your code, you must cite it in your comments. *Any suspected cheating will be immediately reported.*

Exams are closed book, and will be cumulative. The midterm will be a two-hour exam, given during a time when we can all meet for that duration (possibly in the evening). On both exams you are allowed a calculator (or your phone, so long as it is in “airplane mode”) and one two-sided, letter-sized page of notes. They will be graded on a curve, with the highest score considered to be 100%.

Grading

Class work will count toward your final grades with the following weights:

Homeworks	Project	Midterm	Final
35%	15%	20%	30%

In particular, notice how heavily weighted assignments are. *Missing assignments is the easiest way to get a lower grade.* Please be sure you do them, and on time.

Tests will be cumulative. They will each be divided by the top score, so the top performer gets 100%.

Here are the percentages you must earn for each final letter grade:

95%	90%	86⅔%	83⅓%	80%	76⅔%
A	A-	B+	B	B-	C+
73⅓%	70%	66⅔%	63⅓%	60%	Lower
C	C-	D+	D	D-	F

In addition, class participation and effort may help bump you up, if your final grade is borderline.

Attendance

I will not be keeping attendance (except on the first day). However, odds are that your attendance will correlate highly with your final grade.

Miscellany

If there are any special holy days that you will be taking off, please let me know as soon as you can so that we can work around them.

Please consider getting a flu shot. Influenza kills, and disease can spread rapidly in the dorms. (And you really don’t want to miss a week of class. Trust me.)

Finally...if there’s anything else I can do to help you, please let me know. I’m willing to go out of my way to make this a valuable class for you, but I can’t do that unless you talk to me.

Mandatory UPS Boilerplate Syllabus Text

In their infinite wisdom, the lawyers and administrators that lead us have decreed that this text will be included in every class syllabus.

University, Academic, and Administrative Policies

There are many university policies and resources that offer guidance on how to be safe and make the most of your college education. Here are a few that you should take a moment to review:

- Please review university emergency preparedness, response procedures and a training video posted at www.pugetsound.edu/emergency/.
- Protect yourself and others from COVID-19 by following our ongoing campus safety protocols, posted here: <https://www.pugetsound.edu/emergency/communicable-disease-outbreak-prevention/university-response-covid-19/protect-yourself/>.
- For information on academic and administrative policies (such as policies on grade policies, leaves of absence, declaring a major, academic integrity, and academic petitions) please refer to the University Bulletin located here: pugetsound.edu/sites/default/files/2023-08/AD23BULLETIN_online_Academic%20and%20Administrative%20Policies.pdf.
- If you are seeking a religious accommodation in an academic course or program, please follow the process provided in the university's policy on Student Religious Accommodations in Academic Courses or Programs, available at <https://www.pugetsound.edu/office-university-counsel/policies/campuswide-policies/student-religious-accommodations-academic-courses-or-programs/>.
- If you have any concerns about prohibited harassment or discrimination that may be affecting you or others at Puget Sound, please contact the university's Title IX Coordinator/Equal Opportunity Officer, Wheelock 218, 253.879.3793, website: <https://www.pugetsound.edu/title-ix-equal-opportunity/>, email: titleix-ooo@pugetsound.edu. The Title IX Coordinator/Equal Opportunity Officer can explain available options and help address concerns informally or formally.
- If you have a physical, psychological, medical or learning disability that may impact you as a student at Puget Sound, please contact Student Accessibility and Accommodation, Howarth 105, 253.879.3399, website: pugetsound.edu/saa/, email: saa@pugetsound.edu. They will determine with you what accommodations are necessary and appropriate.