

CS 143: Artificial Intelligence

Spring 2026

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Logistics: The lectures and most course content will be hosted at <https://drake.blackboard.com>. Coursework will include attending weekly lecture sessions, completing individual and collaborative activities and programming assignments, a midterm exam, a final exam, and a final project. The goal is to help students practice implementing the concepts we see in class.

Class Meeting Time and Place: We will meet in person twice weekly for lecture sessions.

- Location: Science Connector Building # 101
- Time: Tuesday 3:30 pm - 4:45 pm
- Time: Thursday 3:30 pm - 4:45 pm

Office hours: The instructor will hold weekly office hours, either in person or online via Zoom. Please see Blackboard for up-to-date times and URLs. If you cannot make office hours, contact the instructor to make a separate appointment.

- Office hour#1: Tuesday: 1:00 pm - 3:30 pm
- Office hour#2: Thursday 1:00 pm - 3:30 pm
- Location: Collier-Scripps#323

Course Topics: AI is a broad field dealing with how intelligent agents interact with their environments. It encompasses many different subfields which emphasize different techniques and algorithms. We will start with variations of *search* algorithms which are foundational and useful for solving many kinds of problems. We will then shift to a few other approaches. The tentative plan is cover the following parts of the textbook:

- AI Agents and Environments (Chapters 1-2)
- Problem Solving with Search (Chapters 3-4)
- Adversarial Search (Chapter 5)
- Representing and reasoning about uncertainty
- Reinforcement Learning (Chapter 22)

As time permits, we may also preview topics in machine learning, natural language processing, computer vision, and robotics as a preparation for further coursework in AI.

Learning outcome: After successfully taking this course, you will be able to:

- Understand fundamentals of artificial intelligence.
- Gain an understanding of the advantages and disadvantages of different algorithms and frameworks so that students can choose appropriate solutions given a problem description
- Hand-on experience with commonly used algorithms and software tools within artificial intelligence
- Practice implementing algorithms described in pseudocode
- create and adapt AI programs for solving specific problems

Assignments: You can expect two kinds of assignments:

- **small assignments:** given on a daily or weekly basis. They may include short learning reflections, pen-and-paper illustrations of algorithm execution, small programming labs, etc.
- **project assignments:** you can expect 4-5 larger programming assignments in which you apply course concepts towards computational problems. Each project assignment will be worth more than a typical small assignment. These assignments will generally require some additional documentation and explanatory write-up showing sample output, interpreting results, etc.

Late submissions will not be accepted unless an exception is granted by the instructor *prior to the due date*.

Exams: We will have two exams to be completed during normal class time (or the scheduled final exam time). Exams will emphasize fundamental understanding of algorithms rather than programming. For example, you may be required to work out how an algorithm would run for a particular input or describe characteristics of a given agent and environment.

Textbooks and materials: *Norvig and Russell, Artificial Intelligence: A Modern Approach, 3rd ed., Prentice Hall, 2009*. An electronic or e-book copy is fine for the purposes of the class. You will not need the book for the exams, so sharing a book with other students in the class is practical.

Attendance Policy: Attendance is mandatory. Students are required to attend all weekly meetings *i.e., Tuesday and Thursday from 3:30 pm - 4:45 pm* at Science Connector Building #101. If you cannot attend a class, please email the instructor. This class is highly interactive, meaning that active participation is both expected and the norm. You will receive credit for your participation, and it will be counted towards your final grade. I will keep track of your involvement using a signature sheet. Throughout the course, I will pose questions using polling software and conduct in-class Q&A sessions to better understand how the class is grasping the content. These responses will not be evaluated for correctness but rather for completion. ***More than five absences may result in being withdrawn from the course.*** If you miss an assessment because of illness, you must provide documentation before you can take an assessment. All other absences from assessments must receive prior approval. Additionally, each late arrival (tardiness) or early departure will count as a half of an absence. Accumulating late arrivals or early departures will have the same impact as multiple absences on a student's final grade. It is each student's responsibility to keep track of their absences, late arrivals, and early departures to determine how it will affect their grade.

Schedule, readings, and resources will be available via Blackboard, <https://drake.blackboard.com>.

Grading and requirements:

- *Project assignments (40%).*
- *Small assignments (15%).*
- *Midterm (20%).*
- *Final exam (20%).*
- *Attendance(5%).*

Grading scale: The tentative grading scale for this course would be as follows (subject to change upon Instructor's discretion):

| | | |
|---------------|----------------|----------------|
| A (93%-100%) | A- (90%-92.9%) | B+ (87%-89.9%) |
| B (84%-86.9%) | B- (80%-83.9%) | C+ (77%-79.9%) |
| C (74%-76.9%) | C- (70%-73.9%) | D (60%-69.9%) |
| F (0%-59.9%) | | |

Collaboration Policy: Assignment work may be done in collaboration with other students in class. However, you may not copy others' code or solutions - collaborating means that you are actively engaged in the entire problem-solving process, not merely being assisted by another student who has already completed that portion of the assignment. Each student is expected to write up and submit all of their own work individually, and indicate the names of any collaborators they worked with.

In order to avoid the attempt to copy, you may not look at work that another student has completed but you have not, including students from previous semesters of the course.

Exams must be completed individually. You may not use any notes or materials unless specifically permitted when the exam is announced.

Generative AI Assistance Policy: You may use AI tools like ChatGPT to help you with work you submit for a grade under the following conditions.

- *You may not* pass off AI-generated content as your own work. Be open and transparent about all sources.
- *You must* include a transcript of your *entire* interaction with the AI related to the assignment (even parts that you may not have used). You can either give a shared link to the chat transcript in your code comments (or submission comments) or include it in another attached document where you copy/paste/screenshot the chat.
- *You must* include at least two written paragraphs explaining what you learned and how you will use that in the future. These can be in code/submission comments or a separate attached document. If evidence of learning is not sufficient, *you may not get full credit*.

Accommodations for Students with Disabilities: I will be happy to discuss any academic accommodations needed for students with disabilities. However, any student seeking accommodation must coordinate them with the Access and Success office before the accommodations are needed. No retroactive accommodations will be made.

<https://www.drake.edu/access-success/disability-services/>

Academic Integrity: Drake University has high standards for academic integrity, and you are expected to read the Academic Dishonesty Policy from the College of Arts and Sciences.

<https://www.drake.edu/artsci/studentresources/policiesandregulations/#dishonesty>

Here is a particularly relevant excerpt from the statement:

Academic dishonesty is an all encompassing term involving any activity that seeks to gain credit for work one has not done or to deliberately damage or destroy the work of others. Academic dishonesty includes, but is not limited to, plagiarism, cheating, fabrication, and knowingly helping another to commit an act of academic dishonesty.

Below are some examples of how Drake’s policy applies to this course:

- You may discuss concepts described in the readings or during class with anyone.
- You may collaborate with other students in the class on assignments as described in the Assignment Collaboration Policy given above
- If you use an AI tool like ChatGPT to help you complete something you turn in for a grade, you must follow the AI Assistance Policy given above
- You are encouraged to seek out resources for help in understanding concepts when completing coursework. However, there is a big difference between seeking outside resources for help in understanding (which is good!) and searching for solutions (which is bad). Looking for solutions to an assignment defeats the purpose of the assignment and is not acceptable even if you write up the solution independently.
- All the work you submit must be entirely your own or you must specifically acknowledge and attribute any contribution or assistance from others or any other source that you used. The suggested acknowledgment format is: “[Source X] helped me to do [thing Y] by [explaining Z].”
- You are responsible for safeguarding your work from being copied by others.

The *minimum* penalty for a first violation of academic integrity will be a forfeiture of all points on the entire project, assignment, or exam in question. A second violation will result in a grade of ‘F’ for the course. All violations will be reported to the College of Arts and Sciences Dean’s office as explained in the Academic Integrity Policy.