



Course Syllabus: Computational Thinking and Data Science

McCoy College of Math, Science and Engineering

CMPS 4543/4553 Section 101

Fall 2026

Contact Information

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Course Description

Introduction to the fundamentals of computational thinking and data science in Python. Includes both a study of computational analysis of systems inspired by the sciences, as well topics in data science. Areas will include a bit of algorithm analysis, simulations and visualizations and data collection and processing.

Prerequisites: For CMPS 4543: minimum grade of C in CMPS 3603 and a STAT course. For CMPS 4553: minimum grade of C in CMPS 3013 and Trig or Precalculus.

Textbook & Instructional Materials

- Introduction to Computation and Programming Using Python, 3rded., by John V. Guttag,
- D2L - All important class documentation, lecture videos, assignments, news items, and your gradebook will be posted here.
- Some online lecture videos to allow for time to do in-class work on D2L.
- Lecture notes, sample code and other supplementary material on D2L.

Study Hours and Tutoring Assistance

Tutoring is available in **BO 115 Tutor Lab** and the **Office of Tutoring and Academic Support Programs (TASP)** in Moffett Library. A tutor may assist with programs and homework for computer science classes. The tutor will not do your work.

Course Evaluation

Table 1: Percentage of total grade.

Assignments	Percentage
Quizzes (5 at 25 points each – lowest one dropped)	10%
End of lecture short assignments	10
Programming Projects	30
Midterm	25
Final Comprehensive Exam	25

Midterm and Final Exam will be open book/open notes, but STUDY the material!

Table 2: Final grade scale.

Grade	Percentage
A	80 to 100%
B	70 to 79.9
C	60 to 69.9
D	50 to 59.9
F	Less than 55

Course and Department Policies

Behavior in the classroom

Students are to assist in maintaining a classroom environment that is conducive to learning. Electronic devices are permitted for following along the programming examples, but if this policy is abused, they will be banned. Discussion and questions are encouraged, provided it is pertinent and does not distract from the lesson.

Attendance

Although student attendance is not calculated into the grade, attendance will be taken each day to track students. If a student is absent more than 3 classes and is not performing well in class, a report will be submitted to the Dean of Students and the student may be dropped from the class. Classes will not be streamed for absent students, whether it is excused or not.

Desire-to-Learn (D2L)

Extensive use of the MSU D2L program is a part of this course. Each student is expected to be familiar with this program as it provides a primary source of communication regarding assignments, examination materials, and general course information. You can log into [D2L](#) through the MSU Homepage. If you experience difficulties, please contact the technicians listed for the program or contact your instructor.

Make Up Tests & Quizzes

Students need a valid university excuse (e.g., excuse from the doctor, death in the immediate family, etc.) to make up work or tests.

- For planned *excused* absences: Exam/Quiz may be taken early by prior arrangement.
- For unplanned *excused* absences: Student must make up a missed exam within 4 working days. All other missed exams will receive a zero.

Programming Assignments Policy

Programming projects are expected to be complete and robust, including good user interfaces and the ability to handle improper input. Good documentation will also be expected.

Students will be invited to orally answer questions regarding their assignments in my office and failure to answer those questions correctly will result in deductions from their grades. (Every student can expect to be invited 1-2 times during the semester to answer questions.) **Note: You may use AI to help you debug code you already wrote, but you may NOT use it to write code!**

Late Work

All assignments will be due at 11:30pm CT. Late assignments will be accepted up to 3 working days with a 10-point deduction per day.

Computer Requirements

Taking this class requires you to have access to a computer (with Internet access) to access online course material. **Personal computer technical difficulties will not be considered a reason for extra time to submit assignments, tests, or online discussion postings.** Computers are available on campus in various areas of the buildings, as well as the in the library. Contact your instructor immediately upon having computer trouble. If you have technical difficulties in the course, there is also a student helpdesk available to you. The university cannot work directly on student computers due to both liability and resource limitations, however they are able to help you get connected to our online services. For help, log into [D2L](#).

Policy on Testing Process

The Department of Computer Science has adopted the following policy related to testing.

- All bags, purses, electronics (turned off), books, etc. will be placed in the front of the room during exams, or in an area designated by the instructor.
- Unless otherwise announced by the instructor, nothing is allowed on the desk but pen/pencil/eraser and test papers.
- A student who leaves the room during an exam must turn in the test and will not be allowed to return.

Academic Misconduct Policy & Procedures

Academic Dishonesty: Cheating, collusion, and plagiarism (the act of using source material of other persons, either published or unpublished, without following the accepted techniques of crediting, or the submission for credit of work not the individual's to whom credit is given). Additional guidelines on procedures in these matters may be found in the [Office of Student Conduct](#).

The Department of Computer Science has adopted the following policy related to academic misconduct. The policy will be applied to all submission of work for credit as determined by the instructor of the course, e.g., assignments, quizzes and exams. (See below for link to MSU definitions.)

- *1st instance* of cheating within the program: The student will be assigned a non-replaceable grade of zero for the assignment, project or exam. If the final grade in the course, does not result in a one letter grade reduction, the student will receive a one letter grade reduction in course.
- *Further instances* of cheating in any course within the program: The student will receive a grade of F in the course & be removed from the course.
- All instances of cheating will be reported to the Department Chair, the MCOSME Dean, the Dean of Graduate Students, if a graduate student, and the Office of Rights and Responsibilities, who may decide at their own discretion to impose a stiffer sanction based on knowledge of other instances of cheating at MSU Texas.

Note: Letting a student look at your work is collusion and is academic misconduct!

See Also: [MSU Student Handbook](#): Appendix E: Academic Misconduct Policy & Procedures

https://msutexas.edu/student-life/_assets/files/handbook.pdf.

University Policies

Student Handbook

Refer to: [Student Handbook](#)

Change of Schedule

A student dropping a course (but not withdrawing from the University) within the first 12 class days of a regular semester or the first four class days of a summer semester is eligible for a 100% refund of applicable tuition and fees. Dates are published in the Schedule of Classes each semester.

Refund and Repayment Policy

A student who withdraws or is administratively withdrawn from Midwestern State University (MSU) may be eligible to receive a refund for all or a portion of the tuition, fees and room/board charges that were paid to MSU for the semester. HOWEVER, if the student received financial aid (federal/state/institutional grants, loans and/or scholarships), all or a portion of the refund may be returned to the financial aid programs. As described below, two formulas (federal and state) exists in determining the amount of the refund. (Examples of each refund calculation will be made available upon request).

Services for Students with Disabilities

In accordance with Section 504 of the Federal Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990, Midwestern State University endeavors to make reasonable accommodations to ensure equal opportunity for qualified persons with disabilities to participate in all educational, social, and recreational programs and activities. After notification of acceptance, students requiring accommodations should make application for such assistance through Disability Support Services, located in the Student Wellness Center, (940) 397-4140. Current documentation of a disability will be required in order to provide appropriate services, and each request will be individually reviewed. For more details, please go to [Disability Support Services](#).

Campus Carry Rules/Policies

Refer to: [Campus Carry Rules and Policies](#)

Smoking/Tobacco Policy

College policy strictly prohibits the use of tobacco products in any building owned or operated by WATC. Adult students may smoke only in the outside designated-smoking areas at each location.

Alcohol and Drug Policy

To comply with the Drug Free Schools and Communities Act of 1989 and subsequent amendments, students and employees of Midwestern State are informed that strictly enforced policies are in place which prohibits the unlawful possession, use or distribution of any illicit drugs, including alcohol, on university property or as part of any university-

sponsored activity. Students and employees are also subject to all applicable legal sanctions under local, state and federal law for any offenses involving illicit drugs on University property or at University-sponsored activities.

Campus Carry

Effective August 1, 2016, the Campus Carry law (Senate Bill 11) allows those licensed individuals to carry a concealed handgun in buildings on public university campuses, except in locations the University establishes has prohibited. The new Constitutional Carry law does not change this process. Concealed carry still requires a License to Carry permit, and openly carrying handguns is not allowed on college campuses. For more information, visit [Campus Carry](#).

Active Shooter

The safety and security of our campus is the responsibility of everyone in our community. Each of us has an obligation to be prepared to appropriately respond to threats to our campus, such as an active aggressor. Please review the information provided by MSU Police Department regarding the options and strategies we can all use to stay safe during difficult situations. For more information, visit [MSUReady – Active Shooter](#). Students are encouraged to watch a video that may be electronically accessed via the University police department's webpage: ["Run. Hide. Fight."](#)

Grade Appeal Process

Grade appeals are made to the Dean of the College in writing. Students who wish to appeal a grade should consult the Midwestern State University [MSU Catalog](#).

***Notice:** Changes in the course syllabus, procedure, assignments, and schedule may be made at the discretion of the instructor.

Important Dates

- See [Academic Calendar](#).
- Last Day to drop with a grade of "W:" **November 23, 2026**
- Refer to: [Drops, Withdrawals & Void](#)

List of Topics

Lecture 1 – **Optimization and Knapsack Problem:**

- Computational models
- Intro to optimization
- 0/1 Knapsack Problem
- Greedy solutions

Lecture 2 – **Decision Trees and Dynamic Programming:**

- Decision tree solution to knapsack
- Dynamic programming and knapsack
- Divide and conquer

Lecture 3 – **Graphs:**

- Graph problems
- Shortest path
- Depth first search
- Breadth first search

Lecture 4 – **Plotting:**

- Visualizing Results
- Overlapping Displays
- Adding More Documentation
- Changing Data Display
- An Example

Lecture 5 – **Stochastic Thinking:**

- Rolling a Die
- Random walks

Lecture 6 – **Random Walks:**

- Drunk walk
- Biased random walks
- Treacherous fields

Lecture 7 – **Inferential Statistics:**

- Probabilities
- Confidence intervals

Lecture 8 – **Monte Carlo Simulations**

Lecture 9 – **Monte Carlo Simulations:**

- Sampling
- Standard error

Lecture 10 – **Experimental Data:**

- Errors in Experimental Observations
- Curve Fitting

Lecture 11 – **Experimental Data:**

- Goodness of Fit
- Using a Model for Predictions

Lecture 12 – **Machine Learning:**

- Feature Vectors
- Distance Metrics
- Clustering

Lecture 13 – **Statistical Fallacies**

- Misusing Statistics
- Garbage In Garbage Out
- Data Enhancement