Michigan Technological University

# Course Syllabus

UN5550 – Introduction to Data Science
Fall 2024

## Instructor Information


Instructor: Laura E. Brown, Associate Professor
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Office Hours: M 10:00am–11:00pm, W 2:00pm-3:00pm or by appointment

## Course Identification

Course Number: UN5550
Course Name: Introduction to Data Science
Course Location: 113 Rekhi Hall
Class Times: TR 11:00am – 12:50pm

## Course Description/Overview

Introduces concepts and skills fundamental to Data Science including getting data, data wrangling, exploratory data analysis, basic statistics, data visualization, data modeling, and learning. The course introduces data science from different perspectives: computer science, mathematics, business, engineering, and more.

## Course Resources

### Course Website(s)

- Canvas [https://mtu.instructure.com/courses/1528222]

### Required Course Text

- All readings are available online – linked on Canvas page
- *Introduction to Data Science: A Python Approach to Concepts, Techniques and Applications*, by L. Igual and S. Segui
  The textbook is available in the campus library as a free e-book.

## Course Learning Objectives

Upon successful completion of this course, students will be able to

- *Discuss broad perspectives about data science, and how it affects the world around us*
- *Awareness of tools available to data scientists*
- *Proficiency using Python and it's packages for data science applications*
- *Proficiency presenting findings using Jupyter notebooks*

- *Proficiency in data management: getting data, cleaning data, dealing with missing*
- *data, dimension reduction, exploratory analysis*
- *Appreciation for machine learning: regression, classification*

## Grading Scheme

### Grading System

| ***Letter Grade*** | ***Percentage*** | ***Grade points/credit*** | ***Rating*** |
|---|---|---|---|
| **A** | 93% & above | 4.00 | Excellent |
| **AB** | 88% – 93% | 3.50 | Very good |
| **B** | 83% – 88% | 3.00 | Good |
| **BC** | 78% – 83% | 2.50 | Above average |
| **C** | 73% – 78% | 2.00 | Average |
| **CD** | 68% – 73% | 1.50 | Below average |
| **D** | 60% - 68% | 1.00 | Inferior |
| **F** | 60% and below | 0.00 | Failure |
| **I** | Incomplete; given only when a student is unable to complete a segment of the course because of circumstances beyond the student's control. | | |
| **X** | Conditional, with no grade points per credit; given only when the student is at fault in failing to complete a minor segment of a course, but in the judgment of the instructor does not need to repeat the course. It must be made up by the close of the next semester or the grade becomes a failure (F). A (X) grade is included in the grade point average calculation as a (F) grade. | | |

### Grading Policy

Grades will be based on the following:

| **Course Component** | **Points** |
|---|---|
| Projects | 75% |
| Lab Exercises | 20% |
| Class participation, discussion | 5% |
| **Total** | **100%** |

Scores will be kept in Canvas. Grades are calculated as a percentage of points received weighted for each part of the course in the table above.

### Grade Changes

Project assignments should be graded and returned to you within about 7-14 days. Any request for regrades should be made in writing (e-mail or through Gradescope) to the instructor within one week of returning the material. No grade changes will be made after that point except in the case of an arithmetic error in summing points or the grade was recorded incorrectly in the grade book.

## Course Assessments

### Class Participation and Discussion

This is a graduate level class where class discussion is expected. Part of your grade includes attendance and participation.

**Project Assignments**

There will be ~6-7 project assignments to be completed throughout the semester.

- Each student is expected to create and turn-in their own solution by 11:59pm on the due date listed.
- Assignments should be completed in the file format requested in the assignment description.
- Use of any sources other than the textbook, slides, and resources posted on Canvas should be acknowledged.
- Your work should be neat, legible, formatted well, and follow examples given in class. Remove test code, extra cells, extra printouts other than what is given in the base assignment.
- It is your responsibility to ensure the correct assignment/version is uploaded in the correct file format. You must ensure that your submission runs in the autograder system and produces output to be graded. Late penalties will apply until this is done.

**Late Project Assignments**

All late submissions will receive a grade of zero with the following exceptions:

- Each student has 8 Project Assignment late days to be used in the semester.
    - For any given assignment, you can use a maximum of 2 late days.
    - Each late day used allows an assignment to be turned in a day late without penalty. For example, an assignment due Monday may be turned in on Wednesday, using 2 late days, or an assignment due on Friday may be turned in on Saturday, using 1 late day.
    - After using all your late days, submissions will receive a grade of zero.
- Technology issues unless they are campus or city-wide are not to be used as an excuse for late work.
- Excused absences planned and known in advance, should have projects submitted ahead of time.

The policy is set to account for routine illness, travel, or assignments due in other courses. No other late assignments will be accepted unless a prior arrangement is made with me or I receive an excuse from the Dean of Students office.

**Lab Exercises**

There will be Lab exercises assigned about 1 per week. The lab exercises will contain additional examples paired with code where students can gain practical knowledge and application.

- The Lab exercises will be due by 11:59pm on the due date listed and must be submitted in the format specified.
- You will be working in pairs (or groups of three) for the lab exercises.

- Your work should be neat, legible, formatted well, and follow examples given in class. Remove test code, extra cells, extra printouts other than what is given in the base assignment.
- It is your responsibility to ensure the correct assignment/version is uploaded in the correct file format. You must ensure that your submission runs in the autograder system and produces output to be graded. Late penalties will apply until this is done.
- Lab exercises are low stakes assignments, where the lowest 2 scores will be dropped.

**Late Lab Exercises**

All late lab submissions will receive a grade of zero.

## Collaboration and Cheating

*Adapted from CMU's Center for Teaching Excellence & Educational Innovation*
Students are encouraged to work together to understand the material of this course, but not produce project assignment solutions.

Here are some examples of acceptable collaboration:

- Clarifying ambiguities or vague points in class handouts, textbooks, or lectures.
- Discussing or explaining the general class material.
- Helping with general Python, in using the system facilities, or with editing, debugging, and Python tools.
- Discussing the code that we give out on the assignment.
- Discussing the assignment questions to better understand them.
- Getting help from anyone concerning programming issues which are clearly more general than the specific assignment (e.g., what does a particular error message mean?).

Examples of unacceptable collaboration and academic misconduct are:

- Copying (program or assignment) files from another person or source, including retyping their files, changing variable names, copying code without explicit citation from previously published works (except the textbook), etc.
- Allowing someone else to copy your code or written assignment, either in draft or final form.
- Writing, using, or submitting a program that attempts to alter or erase grading information or otherwise compromise security.
- Looking at someone else's files containing draft solutions, even if the file permissions are incorrectly set to allow it.
- Receiving help from students who have taken the course in previous years.
- Lying to course staff.
- Reviewing any course materials (or software) from previous years.

Collaboration must stop short of copying answers.

Assignment submissions will be checked using software to detect cheating. Any violations will be reported to the Dean of Students and Office of Student Affairs.

Getting Assistance:
If you have questions on the course, I ask you to consider the following options:

- Post a general question to the discussion page
- Post a private specific question to the discussion page.
- Stop by the instructor's office hours
- Email the instructor a clear and detailed question
- Schedule a meeting with the instructor

Academic Misconduct:
Academic misconduct in any form will not be tolerated. Evidence of misconduct will result in zero credit for the assignment, drop in one full final course grade, and notification with the Office of Academic and Community Conduct. Further evidence will result in immediate failure of the course and again reporting of the misconduct to the University.

For more details on academic integrity, please review the Academic Integrity Policy of Michigan Tech http://www.admin.mtu.edu/usenate/policies/p109-1.htm.

## Course Policies

The instructor will conduct this class in an atmosphere of mutual respect. We are all members of an academic community where it is our shared responsibility to cultivate a climate where all students/individuals are valued and where both they and their ideas are treated with respect. You should expect that if your conduct during class seriously disrupts the atmosphere of mutual respect expected in this class, you would not be permitted to participate further.

We live in a connected, fast-paced world. As a result, many of us are expected to be reachable at virtually any time. I strongly advise you to abstain from using your cellphones during class for texting and interacting on social media. If you need to use a cell phone during class, even to text, please step out into the hall.

The course will be run in a computer lab, and we will make use of the computers in most class periods. However, when not you not expected to be working directly, e.g., when new topics are presented, please refrain from using the computer other than to take notes. Class time is not a time for you to work on other course's assignments, play a game, surf the web, or be disruptful to your fellow students. In summary, be respectful to your classmates and instructor.

Michigan Tech is committed to advancing the mental health and well-being of its students. If you or someone you know is feeling overwhelmed, depressed, and/or in need of support, services are available. For help or to find additional resources, contact Counseling Services at 906-487-2538 or visit the Counseling Services website [http://www.mtu.edu/counseling].

## University Policies

Student work products (exams, essays, projects, etc.) may be used for purposes of university, program, or course assessment. All work used for assessment purposes will not include any individual student identification.

Michigan Tech has standard policies on academic misconduct and complies with all federal and state laws and regulations regarding discrimination, including the Americans with Disabilities Act of 1990. For more information about reasonable accommodations or equal access to education or services at Michigan Tech, please call the Dean of Students Office at 906-487-2212. More information is also available from the Syllabi Policies webpage [http://www.mtu.edu/ctl/instructionalresources/syllabus/syllabus_policies.html].

## Course Schedule (see Canvas)