

CSCE 155N – Computer Science I: Engineering & Science

Fall 2023

MWF 2:30PM – 3:20PM
Room 102, Louise Pound Hall

Instructor

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Course Leaders

Levi Busching, Abby Murray

Meeting Location for Office Hours: Avery 15, basement floor of Avery Hall

Office Hours: Busching (T 3:00PM-4:00PM, W 12:00PM-2:00PM), Murray (W 3:30PM-5:30PM, R 2:00PM-3:00PM).

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Learning Assistants

Hayley Hogan, Jack Doherty, Guenther Switzer, Christopher Param

Meeting Location for Office Hours: Avery 15, basement floor of Avery Hall

Office Hours: Hogan (W 12:30PM-2:30PM, F 12:30PM-1:30PM), Doherty (T 2:00PM-4PM, R 3:00PM-4:00PM), Switzer (W 9:00AM-10:30AM, F 1:00PM-2:30PM), Param (W 3:30PM-4:30PM, R 2:00PM-4:00PM)

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Description

This course is divided into three modules. During the first module of this course, we will focus on the basics of computing and at the same time learn MATLAB basics. Although, this is not a programming course, we'll spend time on the necessary programming concepts related to this course. We'll spend the second module of this course exploring engineering design

process and computing. The third module will focus on using MATLAB for advanced computation optimization and data fitting. Throughout the semester, labs and homework assignments will help students connect what they have read and heard with what they can observe, reinforcing the material. One major component of this course is the execution of two projects, which will expose the students to more practical problems within their specific engineering major.

Prerequisites

- MATH 102 or a Math Placement Test score for MATH 103 or higher.

Or consult with the course instructor by email or appointment.

Textbook

Textbook is not mandatory. Students are encouraged to subscribe to Introduction to MATLAB with zyLabs. To subscribe:

1. Sign in or create an account at learn.zybooks.com
2. Enter zyBook code: **UNLCSCE155NPierobonFall2023**
3. Subscribe

Learning Objectives

- Understand the engineering design process basics and importance of computing in it.
- Learn MATLAB basics
Gain skills regarding the problem formulation and translation to MATLAB.
Gain skills regarding implementing a possible solution to a problem in MATLAB.
- Learn to test a developed solution and visualize results in MATLAB to perform benchmarking.

Course Topics

- 1. Introduction**
 - a. Introduction to Computing
 - b. Computing & Engineering
 - c. Variables
 - d. Branches
 - e. Loops
 - f. Functions
- 2. The Engineering Design Process and Computing**
 - a. Engineering Design
 - b. Problem Identification
 - c. Problem Formulation
 - d. Linear Systems
 - e. Graphs & Networks
 - f. Differential Equations
- 3. Computing in MATLAB**
 - a. Introduction to Optimization
 - b. Optimization Techniques
 - c. Data Fitting

d. Introduction to Simulink

Course Organization and Assessment Plan

- **Lectures**

Lectures will be in person according to the course schedule. Participation to the lectures is considered mandatory and will be assured through the participation of students in random quizzes (see below).

- **Diary**

Students will maintain a diary of the in-class MATLAB tutorials. The diary will be in the form of a MATLAB script which would record the work done by students in each tutorial. The diary will be handed over by students after every two weeks and will be evaluated based on completeness. There will be 7 diaries spread throughout the semester, two diaries with the lowest grades would be dropped from the final grade. This means that every student has a chance to make up for up to two (missed) diaries. Note that students should submit every diary so that they can save up to two diaries for rainy days. There will be no separate makeup for diaries.

- **Quizzes**

To motivate class participation, there will be 12 pop quizzes spread throughout the semester. These quizzes will be taken through the MATLAB grader platform and Canvas. At the end of the semester, two quizzes with the lowest grades would be dropped from the final grade. This means that every student has a chance to make up for up to two (missed) quizzes. Note that students should try to perform well in every quiz so that they can use up to two quizzes for rainy days. There will be no separate makeup for quizzes.

- **Homework Assignments**

The purpose of assignments is to enrich and reinforce students learning. Every week students will be handed over an assignment which may include some reading and then related questions or applied problems that the students would solve in MATLAB. There will be 12 homework assignments spread throughout the semester, two homework assignments with the lowest grades would be dropped from the final grade. This means that every student has a chance to make up for up to two (missed) homework assignments. Note that students should try to perform well in every homework assignment so that they can save up to two homework assignments for rainy days. There will be no separate makeup for homework.

- **Labs**

The lab is designed to be a guided learning environment where students will be exposed to more complicated problems and with the guidance of the LA will be able to work through those problem sets. Each lab will be preceded by an in-class MATLAB tutorial in the week before. So, the contents covered in a lab will be related to the preceding MATLAB tutorial. The labs will be in the form of MATLAB live scripts. There will be 12 labs throughout the semester, two labs with the lowest grades would be dropped from the final grade. This means that every student has a chance to make up for up to two (missed) labs. Note that students should attend every lab so that they can save up to two labs for rainy days. There will be no separate makeup for labs.

- **Projects**

This course will consist of two projects. These projects are designed to introduce students to real world applications. Students will form groups of max 4 individuals and will have to choose a project out of a list of projects provided on canvas. Treat the project reports as you would an English paper or history essay, we're grading for both content and quality within this course. Each project report will carry a weightage of 10%.

Final Exam

Students will take a final exam which will their knowledge of applying MATLAB as a tool for engineering problem solving.

Grade Distribution

Final scores will be computed through this weighted distribution:

- **Diary (in class):** 5%
- **Quizzes:** 10%
- **Homework Assignments:** 10%
- **Labs:** 30%
- **Projects:** 20%
- **Final Exam:** 25%

The following scale will be used to determine letter grades. An absolute grading system will be utilized. Scores will be rounded to the nearest integer. For example, scores in the range of 89.00 to 89.49 will be rounded to 89.00, while scores in the range of 89.50 to 89.99 will be rounded to 90.00. Therefore, a score of 89.49 will earn you a B+, whereas a score of 89.50 will earn you an A- (minus):

| | | |
|----------------|---------------|----------------|
| A+: ≥ 97 | A: 93% to 96% | A-: 90% to 92% |
| B+: 87% to 89% | B: 83% to 86% | B-: 80% to 82% |

| | | |
|----------------|---------------|----------------|
| C+: 77% to 79% | C: 73% to 76% | C-: 70% to 72% |
| D+: 67% to 69% | D: 63% to 66% | D-: 60% to 62% |

F: < 60%

Learning Assistant Program

This course is supported by the CSE Learning Assistant Program (LAP). The mission of the LAP is to improve student comprehension and retention in computing fields by focusing on the learner's experience. This course will be supplemented by Learning Assistants and Course Leaders (CLs) to help improve your learning. LAs and CLs are other undergraduate students who have taken the same or similar courses and have been trained to help you succeed in this course. Your LAs and CLs will hold regular office hours, help with grading, and assist you with labs/hacks if your course has any.

I strongly encourage you to utilize the LAs and CLs when you are completing coursework. More information can be seen in the Learning Assistant Program Module on Canvas

Additional Materials

All the following additional materials will be available in Canvas:

- Lecture slides, tutorials and examples
- Additional reading resources
- Homework assignments, diaries, and quizzes, and final exam (Submissions guidelines or links to MATLAB grader assignments)
- Project guidelines

You will be given access to the MATLAB Grader platform for the submission of your assignments.

Attendance

Attendance at all officially scheduled class meetings (class and lab sections) is mandatory. Students are responsible for knowing all material discussed in class meetings. Changes to class lectures and assignments will be announced in class and Canvas.

Academic Integrity

All homework assignments, quizzes, exams, etc. must be the student's own work. No direct collaboration with fellow students, past or current, is allowed unless otherwise stated. The School of Computing has an **Academic Integrity Policy**:

<https://computing.unl.edu/academic-integrity-policy/>

All students enrolled in any computer science course are bound by this policy. You are expected to read, understand, and follow

this policy. Violations will be dealt with on a case-by-case basis and may result in a failing assignment or a failing grade for the course itself.

Dealing with Stress and Adversity

UNL offers a variety of options to students to aid them in dealing with stress and adversity. [Counseling and Psychological Services](#) (CAPS) is a multidisciplinary team of psychologists and counselors that works collaboratively with Nebraska students to help them explore their feelings and thoughts and learn helpful ways to improve their mental, psychological and emotional well-being when issues arise. CAPS can be reached by calling 402-472-7450. [Big Red Resilience & Well-Being](#) provides fun events, innovative education, and dynamic services to help students understand emotions, manage stress, build strength, connect with others, develop grit and navigate transitions.

Students with Disabilities

Students with disabilities are encouraged to contact the instructor for a confidential discussion of their individual needs for academic accommodation. This includes students with mental health disabilities like depression and anxiety. It is the policy of the University of Nebraska-Lincoln to provide individualized accommodations to students with documented disabilities that may affect their ability to fully participate in course activities or to meet course requirements. To receive accommodation services, students must be registered with the Services for Students with Disabilities (SSD) office, 232 Canfield Administration, 472-3787.

Suggestion Box

The School of Computing (SoC) has an **anonymous suggestion box** (<https://computing.unl.edu/anonymous-department-feedback-form/>) that you may use to voice your concerns about any problems in the course or department if you do not wish to be identified.

Stay Up-to-date

It is SoC Department policy that all students in SoC courses are expected to regularly check their email, so they do not miss important announcements.

CSE Resource Student Center

The CSE Student Resource Center (Avery Hall 13A) is intended to provide UNL Computer Science and Computer Engineering majors who are new to the program with a set of resources that will help them assimilate to college life and encourage them to continue their study of Computer Science and Computer Engineering (<https://computing.unl.edu/current-undergraduate/#SRC>).

This syllabus will be updated and expanded as the semester progresses.