

MATH 151: Mathematical Algorithms in MATLAB

SPRING 2024 COURSE INFORMATION

INSTRUCTOR	Dr. Alex Elchesen alex.elchesen@colostate.edu Department of Mathematics Weber 129
TIME AND SPACE	Monday/Wednesday/Friday 9:00 - 9:50 in Weber 205 Office Hours: Wednesday/Friday 10:00-10:50 (immediately after class) in Weber 129
PREREQUISITES	MATH 141 or MATH 155 or MATH 160.
COURSE TOPICS	The following topics will be covered. <ul style="list-style-type: none">• An introduction to MATLAB: environment, scripts, variables.• Vectors, matrices and arrays.• Logic and conditional statements.• Loops: for-loops, while-loops.• Functions in MATLAB.• Plotting and 3D visualization in MATLAB.• Numerical methods: Newton's method, numerical differentiation, numerical integration, and numerical solutions to differential equations.
LEARNING OBJECTIVES	The first objective of this course is to give you a formal introduction to the MATLAB programming language and environment. You will become familiar with the MATLAB environment and its basic commands. The second objective is to introduce you to different mathematical algorithms that can then be implemented in MATLAB. For example, you may be familiar with Newton's method for calculating roots of functions. In a calculus course, you would likely compute a few iterations of the algorithm by hand. In this course, you will learn to implement Newton's method in MATLAB, allowing you to compute hundreds or thousands of iterations of the algorithm very quickly in order to compute roots very precisely.
TEXTBOOK	There is no textbook for this course. Slides of the material will be provided.
CLASS STRUCTURE	Class time will be a combination of lecture, labs, activities, and quizzes. Typically we will have lectures on Mondays and quizzes on Fridays, with Wednesdays and any remaining times reserved for labs. There will also be worksheets to be completed for attendance/participation. All announcements and course materials will be posted on Canvas.
ASSESSMENT	► Labs (40%) Each week you will have one lab to complete, which will typically be due Friday at midnight. Wednesdays and Fridays before quizzes will

be reserved for working on the labs in class. You are responsible for finishing the lab outside of class if you do not finish it during the reserved lab time.

► **Quizzes** (20%) There will be a 20 minute quiz every Friday at the end of class.

► **Final Exam** (20%) There will be a final exam in two parts. Part 1 will be in class on Wednesday, March 27 and Part 2 will be in class on Friday, March 29. A final review problem set will be provided and Monday, March 25 will be reserved as a review day.

► **Attendance/Worksheets** (20%) Attendance for the whole class period is required. I will either call attendance or have a worksheet that you must submit for attendance points. You must attend at least 85% of classes to get all of your attendance points (this means roughly that you can miss at most 3 classes).

COVID GUIDELINES

All students are expected and required to report any COVID-19 symptoms to the university immediately, as well as exposures or positive tests (even home tests).

- If you suspect you have symptoms, or if you know you have been exposed to a positive person or have tested positive for COVID (even with a home test), you are required to fill out the COVID Reporter (<https://covid.colostate.edu/reporter/>).
- If you know or believe you have been exposed, including living with someone known to be COVID positive, or are symptomatic, it is important for the health of yourself and others that you complete the online COVID Reporter. Do not ask your instructor to report for you.
- If you do not have internet access to fill out the online COVID-19 Reporter, please call (970) 491-4600.
- You may also report concerns in your academic or living spaces regarding COVID exposures through the COVID Reporter. You will not be penalized in any way for reporting.
- When you complete the COVID Reporter for any reason, the CSU Public Health Office is notified. Students who report symptoms or a positive antigen test through the COVID Reporter may be directed to get a PCR test through the CSU Health Network's medical services for students.

For the latest information about the University's COVID resources and information, please visit the CSU COVID-19 site: <https://covid.colostate.edu/>.

POLICY ON ACADEMIC INTEGRITY

This course will adhere to the CSU Academic Integrity Policy as found on the Student Responsibilities page of the CSU General Catalog and in the Student Conduct Code. Any student found to have engaged in academic dishonesty may receive a grade penalty (possibly a failing grade for the class) and be subject to further University disciplinary action. Examples of academic dishonesty include, but are not limited to, collaborating on an exam, using a cell phone or other technologies on an exam, using reference material (writing on hands,

shoes, etc.) during an exam, and representing someone else's work as your own. More information can be found at <http://tilt.colostate.edu/integrity>.

DISABILITIES

Colorado State University is committed to providing reasonable accommodations for all persons with disabilities. Students with disabilities who need accommodations must first contact Student Disability Center (SDC) before requesting accommodations for this class.