BCSC215: Introduction to MATLAB

Spring 2026
TU&TH 12:30 PM - 1:45 PM (RR 304E)

Instructors

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Course Overview

A hands-on introduction to data-analysis oriented programming using MATLAB, intended for students with minimal programming experience. MATLAB is a widely used language in neuroscience and BCS research for data analysis. Topics in the workshop include, but are not limited to, data types, functions and plotting. No prior programming experience is required.

About this Course
This course meets in person, and attendance is mandatory. If you are unable to attend a session, please inform the instructor in advance. Main components of this course are: lectures, weekly assignments, exams and a final project.

Course Learning Objectives and Activities
After taking this course, you should be able to …

- Perform data wrangling independently, including filtering, cleaning, and manipulating datasets.
- Create clear and informative data visualizations in MATLAB, using a variety of plotting tools and techniques.
- Conduct basic statistical analyses on data and interpret the results appropriately.

During this course, you will …

- Learn to use a range of MATLAB functions and features for data analysis and visualization.
- Complete in-class coding exercises designed to reinforce key concepts.
- Work in pairs or small groups to discuss coding approaches, compare solutions, and troubleshoot challenges collaboratively.
- Apply newly learned techniques to real or simulated datasets throughout the semester.

Assessment and Grading Policy

Grading Policy
Final grade in this course will be based on your performance across attendance, exams, assignments, and a final project. Consistent participation and timely submission of all work are essential for success. All grades will be posted on the course LMS as they become available.

Weighting of Assessments

10% - attendance. Regular attendance is required. More than two unexcused absences may affect your grade. An excused absence must be supported by a doctor's note.

40% - two midterm exams (20% each)

30% - final project. The final project is composed of dataset selection, research planning, data analysis and visualization, and presenting findings in class.

20% - weekly coding assignments (grade based on completion)

Late Work Policy

Assignments submitted within 24 hours of the deadline will receive a 10% deduction.

Assignments submitted 24–72 hours late will receive a 20% deduction.

Assignments more than 72 hours late will not be accepted unless prior arrangements have been made with the instructor.

Extensions may be granted only if requested before the deadline and only in cases of documented emergencies or exceptional circumstances.

The final project must be submitted on time; late project submissions are accepted only with an approved extension.

Letter Grade Scale

A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F
93-100	90-92	87-89	83-86	80-82	77-79	73-76	70-72	67-69	63-66	60-62	<60

Course Policy

Academic Honesty
All assignments and activities associated with this course must be performed in accordance with the University of Rochester's Academic Honesty and Plagiarism. Please get in touch with your

instructor if you have any questions regarding what constitutes academic dishonesty, especially as it relates to exams and the final project.

Coding Assignments

- You may work together with classmates to discuss coding strategies, troubleshoot, and explore different approaches. If you do so, add their names to your assignment.
- You may use any external resources, including textbooks, online tutorials, MATLAB documentation, forums, and AI tools.
- However, all submitted code must be written individually.
- If you use external code (e.g., a snippet from online forums or AI-generated examples), you must cite the source within your script (e.g., as a comment).

Exams

- Exams must be completed independently, without assistance from classmates, friends, tutoring services, or AI tools.
- The only permitted resource is the official MATLAB documentation.
- Any collaboration or use of unauthorized resources will be considered an academic integrity violation.

Final Project

- You may discuss general coding strategies and ideas with others, but the project must be entirely your own work, including data wrangling, analysis, visualization, and written explanations.
- Each student must submit a unique project with distinct goals, dataset choice, analysis steps, and code.
- External resources may be used, but they must be properly cited in your code or report.

Accessibility Accommodations

The University of Rochester respects and welcomes students of all backgrounds and abilities. In the event you encounter any barrier(s) to full participation in this course due to the impact of a disability, please contact the Office of Disability Resources. The access coordinators in the Office of Disability Resources can meet with you to discuss the barriers you are experiencing and explain the eligibility process for establishing academic accommodations.

You can reach the Office of Disability Resources at: disability@rochester.edu; (585) 276-5075; Taylor Hall.

University Disability Resources

Accessibility at Rochester

Equal Opportunity at University of Rochester

For information on accessibility of the University Learning Management System and associated software, see Technology Support and Information.

Course Schedule

CA: coding assignment
PM: project milestone
All CAs and PMs are due before class.

Wk	Date	Day	Topic	Items	Assignments
1	01/20	T	Introduction	Syllabus	
	01/22	R	MATLAB Basics	IDE, arithmetic, syntax, variables, and features	
2	01/27	T	Vectors	Vectors, vector arithmetic	CA1 distributed
	01/29	R	Loops	for/while	
3	02/03	T	Plotting	Logicals, operators, if statements	CA1 due, CA2 distributed
	02/05	R	Branching/Logicals	If/else/elseif, comparisons, logicals	
4	02/09	M	Matrices	Matrices, nested loops	CA2 due
	02/12	R	**Exam I**	All topics up to this date	PM1 distributed
5	02/16	M	Data structures	Cell arrays, structs, tables	CA3 distributed
	02/19	R	Functions, saving/loading files	Defining functions. Saving/loading `.mat` files	PM1 due
6	02/23	M	Logical indexing I	From for-loops to logical indexing. Logical vector operations	CA3 due, CA4 distributed
	02/26	R	Logical indexing II	Filtering tables and other forms of data	
7	03/02	M	Statistical testing I	T-tests, ANOVA	CA4 due, CA5 distributed
	03/05	R	Plotting II	Axes, colors, symbols, `errorbar`, `tiledlayout`	
8	03/16	M	Hackathon I		CA5 due
	03/19	R			
9	03/23	M	**Exam II**	Cumulative	
	03/26	R	Exam review/Final		

			project		
10	03/30	M	Time series data		
	04/02	R	Statistical testing II		
11	04/06	M	Hackathon II	Time series	
	04/09	R			
12	04/13	M	TBD		
	04/16	R	TBD		
13	04/20	M	TBD		
	04/23	R	TBD		
14	04/27	M	Final Project Presentations		
	04/30	R			

Start of class: 01/20 (T)

Spring break: 03/07 - 03/15

End of class: 05/05 (F)