



School of Engineering
*Information
Technology Program*

ITP 168 – Introduction to MATLAB

Units: 2

Fall 2021

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IT Help: Provided by Viterbi IT

Hours of Service: 8am–5pm M-F

Walk-in: DRB 205

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Course Description

Fundamentals of MATLAB: a high-performance numeric computation and visualization environment. Overview of linear algebra and matrix manipulation using 2-D and 3-D plotting routines; programming in MATLAB; basic numerical analysis

Learning Objectives

Students will be able to:

- Develop algorithms to solve multi-domain problems
- Create MATLAB script and function files
- Create and manipulate data in arrays, cells, structures, and various other forms
- Visualize data using 2D and 3D plotting routines
- Design, build, and test MATLAB programs and functions
- Solve derivative and integration problems using numerical methods
- Set up and solve systems of equations

Prerequisite(s): None

Co-Requisite(s): None

Concurrent Enrollment: None

Recommended Preparation: MATH 118x or MATH 125

Course Notes

All lecture slides and course content including homework will be posted to the course Blackboard page. Course announcements will be posted to Piazza online forum, posted as an announcement to Blackboard, or emailed directly to your USC emails. Midterm and Final Examination are to be completed through the Gradescope platform. Instructions on accessing these different systems will be given before the first class session.

Technological Proficiency and Hardware/Software Required

Students are expected to be able to perform the following tasks before the course begins:

- **Create a ZIP file that contains one or more files**
- **UnZIP a file that contains one or more files**
- **Submit files through Blackboard's submission page**
- **Install MATLAB software**
- **Download files from Blackboard**

We will be using MATLAB R2019b. Your code **MUST** work in R2019b, otherwise it will be considered incorrect. There are newer versions of MATLAB, but you are responsible for making sure it works in R2019b. All functions/concepts given in **lecture** are compatible with MATLAB R2019b. Your code must work without using any other library/toolbox/supplemental add-ons for MATLAB. If you use an obscure function only present in the Statistics and Analytics, or Machine Learning, or Image Processing toolboxes you will not get credit. MATLAB is available for download at: <https://software.usc.edu/>

Required Readings and Supplementary Materials

Students are required to purchase a zyBooks account for the duration of the semester. Readings will be posted to zyBooks and participation will be contingent upon completion of the readings and online exercises (Participation Activities). Subscribe at <http://zybooks.zyante.com> using the specific code given in class.

Optional textbook: "Mastering MATLAB" Duane Hanselman, Bruce Littlefield. Pearson Education. ISBN: 9780136013303

Grading Breakdown

You will be graded on the following

ITEM	% of Grade	
Lab Assignments	15	
Homework Assignments	25	
Midterm Exam	25	
Final Exam	30	
zyBooks	5	
TOTAL	100	

Grading Scale

Course final grades will be determined using the following scale

A	93+
A-	90 - <93
B+	87 - <90
B	83 - <87
B-	80 - <83
C+	77 - <80
C	73 - <77
C-	70 - <73
D+	67 - <70
D	63 - <67
D-	60 - <63
F	<60

Assignment Submission Policy - Homework

Homework assignments are to be submitted on Blackboard only. Any other form of submission to instructor, teaching assistant, or grader will not be counted. Only the last submission on Blackboard will be graded. Students will not be able to get points for any previous submissions regardless of whether the previous submissions were correct or on time.

Homework assignments are assigned at the end of the week and will be due one or two weeks after being assigned. The assignment sheet will have the due date listed. Homework will be accepted after the deadline with the following penalties:

- After due date/time up to 24 hours: -10% of total possible points for assignment
- 24 hours after due date/time up to 48 hours: -20% of total possible points for assignment
- 48 hours after due date/time up to 72 hours: -40% of total possible points for assignment
- 72 hours or more after due date/time: No credit for assignment

Extensions for homework will only be granted for those students who have a medical/family emergency or illness resulting in an inability to complete the assignment on time. Students must provide official documentation.

Assignment Submission Policy - Lab

Labs will be assigned via zyBook's online lab platform zyLabs. Lab assignments are worth a varying amount of points based on difficulty and/or complexity. In order for a lab to receive full credit, they must perform the required tasks described in the assignment sheet and follow all conventions set forth in class including commenting and documentation. Students can submit as many submissions to the lab as they wish, though they must wait one hour between submissions. Due dates are specific to each lab and will be clearly marked on the lab instructions. Students must complete the assigned lab on their own and may not consult with other students on the labs. Any plagiarism or academic dishonesty will result in immediate disciplinary action as defined by USC policy.

There are no makeup labs and there are no late labs accepted. The only exception is a medical/family emergency, provided the student notify the instructor and provide official documentation for the emergency.

You will be allowed to drop 2 of your lowest lab grades. This will be done automatically for you so you don't have to specify which ones you want to drop.

Grading Timeline

Labs will be graded using zyLab's auto-grading platform. Grading of homework will typically be done within one week of the deadline.

Additional Policies

Students who add the course after the start of the semester are responsible for all the work during the time they were not enrolled. A student must contact the instructor about their enrollment and schedule a time to complete the missing work. Any student who fails to contact the instructor to make up the work will be granted a 0 for the work missed. Contact must be made before the add/drop deadline.

Students are expected to complete the zyBooks readings and activities by the end of the week on which they were assigned. The end of the week will always be denoted as Saturday at midnight. If a student has not completed all of the readings and activities, they will be given a participation grade based on the percentage they have completed. The reading materials contains three different types of activities: Participation Activities, Challenge Activities, and zyLabs. Students are required to complete the Participation Activities to get credit for the zyBooks component of the course. The Challenge Activities are optional, and will NOT count for extra credit. The zyLabs activities will count towards the Lab portion of the grade. Students will be allowed to drop their 2 lowest participation grades. This will be done automatically so there is no need to specify which ones to drop.

Make-up policy for exams: To make up for a missed exam, the student must provide a satisfactory reason (as determined by the instructor) along with proper documentation. Make-up exams are generally only offered in medical or family emergency situations with the appropriate documentation. Missing an examination due to unforeseen delays in non-emergency travel plans will not constitute a satisfactory reason.

Before logging off any ITP-owned computer (laptops, desktops in OHE 540, OHE 542, KAP 107, KAP 160, KAP 162, KAP 267) students must ensure that they have saved any work to either a USB drive or a service such as Dropbox. Any work saved to the computer will be erased after restarting the computer. ITP is not responsible for any work lost.

ITP offers Open Lab use for all students enrolled in ITP classes. These open labs are held beginning the second week of classes through the last week of classes. Hours are listed at: <http://itp.usc.edu/labs/>.

This course will make use of Piazza, an online discussion forum. Students will be invited to join the class discussion, but are not required to. Students may post questions, answer other student's questions, post anonymously, or post privately. Students are not allowed to post homework or lab code to Piazza publicly. Students may post homework or lab code privately on Piazza to instructors only. Any student caught posting homework or lab code on Piazza will be punished through SJACS.

Course Schedule: A Weekly Breakdown

	Topics/Daily Activities	Labs/Homework	Deliverable/ Due Dates
Week 1	Day 1: Intro/Variables Day 2: Algorithms /Arithmetic	No Lab	Week 1 Reading Due
Week 2	Day 1: Vectorization Day 2: Elementary Code Patterns	Lab1 HW1 Assigned	Week 2 Reading Due
Week 3	Day 1: Vector Functions Day 2: Descriptive Statistics	Lab2 HW2 Assigned	Week 3 Reading Due HW1 Due
Week 4	Day 1: Conditionals Day 2: Logic Arrays	Lab3	Week 4 Reading Due
Week 5	Day 1: Loops Day 2: More Loops	Lab4 HW3 Assigned	Week 5 Reading Due HW2 Due
Week 6	Day 1: Cell Arrays/Strings Day 2: Structures	Lab5	Week 6 Reading Due
Week 7	Day 1: File I/O Day 2: Functions	Lab6 HW4 Assigned	Week 7 Reading Due HW3 Due
Week 8	Day 1: Mid Semester Review Day 2: Midterm		
Week 9	Day 1: More Functions Day 2: Debugging	Lab7	Week 9 Reading Due
Week 10	Day 1: 2D Plotting Day 2: 3D Plotting	Lab8	Week 10 Reading Due
Week 11	Day 1: Animating Plots Day 2: Data Analysis	Lab9 HW5 Assigned	Week 11 Reading Due HW4 Due
Week 12	Day 1: Differentiation/Zero Finding Day 2: Integration	Lab10	Week 12 Reading Due
Week 13	Day 1: Solving Linear Systems Day 2: Triangular Factorization/Non-Linear Systems	Lab11 HW6 Assigned	Week 13 Reading Due HW5 Due
Week 14	Day 1: Regular Expressions Day 2: Live Scripting	Lab12	
Week 15	Day 1: Advanced Data Types Day 2: Semester Wrap Up	Lab13	HW6 Due
FINAL			Date: For the date and time of the final for this class, consult the USC <i>Schedule of Classes</i> at www.usc.edu/soc .

Statement on Academic Conduct and Support Systems

Academic Conduct:

Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” policy.usc.edu/scampus-part-b. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, policy.usc.edu/scientific-misconduct.

Support Systems:

Counseling and Mental Health - (213) 740-9355 – 24/7 on call

studenthealth.usc.edu/counseling

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call

suicidepreventionlifeline.org

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-9355(WELL), press “0” after hours – 24/7 on call

studenthealth.usc.edu/sexual-assault

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) - (213) 740-5086 | Title IX – (213) 821-8298

equity.usc.edu, titleix.usc.edu

Information about how to get help or help someone affected by harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants.

Reporting Incidents of Bias or Harassment - (213) 740-5086 or (213) 821-8298

usc-advocate.symplicity.com/care_report

Avenue to report incidents of bias, hate crimes, and microaggressions to the Office of Equity and Diversity | Title IX for appropriate investigation, supportive measures, and response.

The Office of Disability Services and Programs - (213) 740-0776

dsp.usc.edu

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Campus Support and Intervention - (213) 821-4710

campussupport.usc.edu

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

diversity.usc.edu

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 – 24/7 on call

dps.usc.edu, emergency.usc.edu

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 – 24/7 on call

dps.usc.edu

Non-emergency assistance or information.