

**Purpose:** This course is an introduction to programming with applications in engineering, which will be useful to anyone who processes data, simulates complex systems, or automates repetitive tasks.

**Bulletin Description:** Introduction to programming in MATLAB: numeric, Boolean, and string variables; flow control structures; vectors and matrices; and script and function files. MATLAB will be studied in the context of multiple engineering disciplines with applications.

Credit Hours: 2. Prerequisites: None.

**Course Website:** <http://sites.up.edu/egr111/>

**Textbook:** The required textbook is an on-line MATLAB textbook from zyBooks. It is available for purchase at the UP bookstore or by the following method:

1. Sign in or create an account at [learn.zybooks.com](http://learn.zybooks.com)
2. Enter zyBook code: UPEGR111HoffbeckSpring2020
3. Subscribe

**Software:** MATLAB will be used extensively in the course. Students can access MATLAB from the computers in Shiley Hall and from any computer connected to the internet through the Virtual Desktop Interface (VDI).

**Class Schedule:**

Section	Time	Room	Instructor	Final Exam Schedule
A	MW 1:35-2:30	Shiley 206	Dr. Jordyn Wolfand	Tue, 4/28/20, 8-10am
B	TR 11:20-12:15	Shiley 206	Dr. Jordyn Wolfand	Tue, 4/28/20, 10:30-12:30
C	TR 2:30-3:25	Shiley 249	Dr. Joseph Hoffbeck	Thur, 4/30/20, 8-10am
D	TR 12:55-1:50	Shiley 206	Dr. Timothy Doughty	Wed, 4/29/20, 1:30-3:30pm
E	MW 11:25-12:20	Shiley 249	Dr. Jordyn Wolfand	Thur, 4/30/20, 10:30-12:30

**Contact Info:** Dr. Jordyn Wolfand, 503-943-8751, [wolfand@up.edu](mailto:wolfand@up.edu), Shiley Hall 219  
 Dr. Joseph Hoffbeck, 503-943-7428, [hoffbeck@up.edu](mailto:hoffbeck@up.edu), Shiley Hall 212  
 Dr. Timothy Doughty, 503-943-8569, [doughty@up.edu](mailto:doughty@up.edu), Shiley Hall 237

**Office Hours:** Arranged by individual instructor.

**Course Learning Objectives:**

- To write MATLAB computer programs, including assignment, indexing, plotting, importing and exporting data, loops, branching, script files, and user-defined functions.
- To demonstrate skills in designing, implementing, testing, debugging, and analyzing programs in the context of engineering problems.
- To apply MATLAB to technical problems in multiple engineering disciplines with applications such as image and sound processing, heat transfer, and stress-strain analysis.

**Assessment:** Student learning will be assessed as follows:

	Points Each	Total Points	Total %
9 Reading Assignments*	6	48	8
11 Lab Checkpoints*	6	60	10
11 Homework Assignments*	6	60	10
5 Quizzes*	40	160	27
3 Projects	25	75	13
3 Engagement Activities	12	36	6
Professionalism	11	11	2
Final Exam	150	150	25
<b>Total</b>		<b>600</b>	<b>100</b>

\* Late reading assignments, labs, and homework assignments will not be accepted, but the lowest reading assignment, lab, and homework assignment score will be dropped. No makeup quizzes will be offered, but the lowest quiz score will be dropped.

The final grade will be determined by adding up the scores (except the lowest reading assignment, lab checkpoint, homework assignment, and quiz score), dividing by total number of points possible, and multiplying by 100 to determine the grade as a percentage. Then letter grades are assigned as follows:

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

**Deadlines:** Most of the labs have three parts: reading assignment, checkpoints, and homework. The reading assignments include Participation Activities which are required and due at the beginning of class on the day of the lab. The Challenge Activities are optional. If the textbook chapter is empty, then there is no reading assignment for that lab. During the labs, there are lab checkpoints which are due at the beginning of the following class period. So if you cannot complete a lab during class, you can finish it outside of class and get it checked off at the beginning of the next class period. The deadline for submitting the homework assignment is 11PM on the night of the following class period.

**Specific Outcomes of Instruction:** At the successful completion of this course, students should be able to do the following:

1. Use the MATLAB help facility
2. Plot data and functions
3. Use trig functions
4. Load, process, and listen to audio files
5. Manipulate complex numbers
6. Write and use functions
7. Use relational and logical operators
8. Write if-else-end statements
9. Write loops
10. Load, process, and view images
11. Write programs to solve engineering problems

**Course Schedule:** Below is the tentative course schedule.

Class Period	Topic
1	Course Overview
2	Intro to MATLAB
3	Vectors and Plotting Data
4	Trig Functions
5	Audio Processing (Quiz 1)
6	Functions
7	Matrices and Relational Operators
8	Conditional Execution
9	Loops (Quiz 2)
10	Fourier Series
11	Image Processing
12	Heat Transfer
13	Programming Techniques (Quiz 3)
14	Project 1
15	Project 1 (Cont.)
16	Project 1 (Cont.)
17	Project 1 (Cont.)
18	Project 2 (Quiz 4)
19	Project 2 (Cont.)
20	Project 2 (Cont.)
21	Project 2 (Cont.)
22	Project 3 (Quiz 5)
23	Project 3 (Cont.)
24	Project 3 (Cont.)
25	Project 3 (Cont.)
26	Review for Final Exam
27	Final Exam (during finals week)

## Academic Integrity Examples

Students are strongly encouraged to help each other learn during the labs and outside of class, so the following activities are **not** considered cheating in this course:

- asking other students or the instructor questions or answering questions about the reading assignments, labs or homework assignments
- helping debug other students' solutions to the labs or homework assignments
- asking or answering general questions about MATLAB or other course material

However, since copying does not help students learn, the following are examples of activities that **are** considered cheating in this course:

- copying the solutions to reading assignments, labs, quizzes, homework assignments, and exams
- providing the solutions to reading assignments, labs, quizzes, homework assignments, and exams to other students
- communicating with others during a quiz or exam in any form, verbally, non-verbally, electronically, in writing, etc.
- gaining access to a quiz, exam, or the solution before the quiz or exam
- changing an answer after a quiz or exam is returned, and then turning it in for a re-grade

If you have any questions about what is considered cheating this course, please ask your instructor.

## **University Policies and Resources:**

### **University of Portland's Code of Academic Integrity**

Academic integrity is openness and honesty in all scholarly endeavors. The University of Portland is a scholarly community dedicated to the discovery, investigation, and dissemination of truth, and to the development of the whole person. Membership in this community is a privilege, requiring each person to practice academic integrity at its highest level, while expecting and promoting the same in others. Breaches of academic integrity will not be tolerated and will be addressed by the community with all due gravity.

### **Assessment Disclosure Statement**

Student work products for this course may be used by the University for educational quality assurance purposes.

### **Accessibility Statement**

The University of Portland endeavors to make its courses and services fully accessible to all students. Students are encouraged to discuss with their instructors what might be most helpful in enabling them to meet the learning goals of the course. Students who experience a disability are also encouraged to use the services of the Office for Accessible Education Services (AES), located in the Shepard Academic Resource Center (503-943-8985). If you have an AES Accommodation Plan, you should make an appointment to meet with your faculty member to discuss how to implement your plan in this class. Requests for alternate location for exams and/or extended exam time should, where possible, be made two weeks in advance of an exam, and must be made at least one week in advance of an exam. Also, you should meet with your faculty member to discuss emergency medical information or how best to ensure your safe evacuation from the building in case of fire or other emergency.

### **Mental Health Statement**

As a college student, you may sometimes experience problems with your mental health that interfere with academic experiences and negatively impact daily life. If you or someone you know experiences mental health challenges at UP, please contact the University of Portland Health and Counseling Center in Orrico Hall (down the hill from Franz Hall and Mehling Hall) at [www.up.edu/healthcenter](http://www.up.edu/healthcenter) or at 503-943-7134. Their services are free and confidential, and if necessary they can provide same day appointments. In addition, after-hours phone counseling is available if you call 503-943-7134 and press 3 outside of business hours. Also know that the University of Portland Public Safety Department (503-943-4444) has personnel trained to respond sensitively to mental health emergencies at all hours. Remember that getting help is a smart and

courageous thing to do – for yourself, for those you care about, and for those who care about you.

### **Non-Violence Statement**

The University of Portland is committed to fostering a community free from all forms of violence in which all members feel safe and respected. Violence of any kind, and in particular acts of power-based personal violence, are inconsistent with our mission. Together, we take a stand against violence. Join us in learning more about campus and community resources, UP's prevention strategy, and reporting options on the [Green Dot website](http://www.up.edu/greendot), [www.up.edu/greendot](http://www.up.edu/greendot) or the [Title IX website](http://www.up.edu/titleix), [www.up.edu/titleix](http://www.up.edu/titleix).

### **Ethics of Information**

The University of Portland is a community dedicated to the investigation and discovery of processes for thinking ethically and encouraging the development of ethical reasoning in the formation of the whole person. Using information ethically, as an element in open and honest scholarly endeavors, involves moral reasoning to determine the right way to access, create, distribute, and employ information including: considerations of intellectual property rights, fair use, information bias, censorship, and privacy. More information can be found in the Clark Library's guide to the [Ethical Use of Information](http://libguides.up.edu/ethicaluse) at [libguides.up.edu/ethicaluse](http://libguides.up.edu/ethicaluse).

### **The Learning Commons**

Trained peer tutors and writing assistants in the Learning Commons, located in Buckley Center 163, work with you to facilitate your active learning and mastery of skills and knowledge. For questions about the Learning Commons, please send all correspondence to Jeffrey White, Administrator, at [white@up.edu](mailto:white@up.edu). The Learning Commons is a program of the Shepard Academic Resource Center (SARC.)

**Math Resource Center:** Appointment-based tutoring is available through our online scheduler at [www.bit.ly/up\\_mrc](http://www.bit.ly/up_mrc). Walk-in tutoring Sundays through Thursdays evenings. For MTH 141, request appointments at [math141@up.edu](mailto:math141@up.edu). The course-specific schedule can be found at [www.up.edu/learningcommons](http://www.up.edu/learningcommons), or the reception desk in BC 163.

**Writing Assistance:** Brainstorming ideas for your paper, create an outline, work on citations, or review a draft with a Writing Assistant. Visit [www.up.edu/learningcommons](http://www.up.edu/learningcommons) to access our Writing Center schedule.

**The Language Studio:** Contact the language assistance hotlines to schedule a time to meet throughout the semester at [chinesetutor@up.edu](mailto:chinesetutor@up.edu), [frenchtutor@up.edu](mailto:frenchtutor@up.edu), [germantutor@up.edu](mailto:germantutor@up.edu), or [spanishtutor@up.edu](mailto:spanishtutor@up.edu).

**Natural Sciences Center:** Send your tutoring requests to [biotutor@up.edu](mailto:biotutor@up.edu), [chemtutor@up.edu](mailto:chemtutor@up.edu), or [physicstutor@up.edu](mailto:physicstutor@up.edu).

**Speech & Presentation Lab:** Improve your presentations by requesting an appointment at [speech@up.edu](mailto:speech@up.edu).

**Group Work Lab:** Make an appointment for your group project at [groupwork@up.edu](mailto:groupwork@up.edu).

**Nursing Tutoring:** Tutoring is available for pathophysiology, BIO205, anatomy and physiology, and other nursing courses on a walk-in or appointment basis. Up-to-date schedule information is at [www.up.edu/learningcommons/nursing](http://www.up.edu/learningcommons/nursing).

**Economics and Business Tutoring:** For support in economics, OTM, finance, accounting, and business law courses, send requests for appointments to your discipline's tutor email hotline: [econtutor@up.edu](mailto:econtutor@up.edu), [otmtutor@up.edu](mailto:otmtutor@up.edu), [financetutor@up.edu](mailto:financetutor@up.edu), [accountingtutor@up.edu](mailto:accountingtutor@up.edu), or [bizlaw@up.edu](mailto:bizlaw@up.edu).

**Shiley Sophomore Fellows:** Provides tutoring in several sophomore engineering classes. To make an appointment, send a request to [stepUP@up.edu](mailto:stepUP@up.edu).

**Learning Assistance Counselor:** Learning assistance counseling is also available in BC 163. The counselor teaches learning strategies and skills that enable students to become more successful in their studies and future professions. The counselor provides strategies to assist students with reading and comprehension, note-taking and study, time management, test-taking, and learning and remembering. Appointments can be made in the on-line scheduler available to all students in Moodle or during posted drop-in hours.