

Description Introduction to Python and MATLAB. Concepts of formatted input/output, data types, variables, arrays, strings, variable scopes, logic statements, loops and repetition, functions and subroutines, and data graphing. Computing examples are drawn from mechanical engineering topics including linear algebraic equations, root search, two and three-dimensional graphics.

Instructor Alejandro Gutiérrez, Ph.D.
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 Office Hours: Tuesdays 13:30 – 15:30 & Thursdays 13:30-15:30

TA **02L** Muztoba Rabbani mrabbani@ucmerced.edu
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04L Yogesh Bhusal ybhusal@ucmerced.edu
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06L Yogesh Bhusal ybhusal@ucmerced.edu
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Lecture Mondays, 13:30-15:20 at COB2 110

Labs **02L** Tuesdays & Thursdays 19:30-22:20 at KOLLIG 208
03L Mondays & Fridays 7:30 - 10:20 at SSM 154
04L Mondays & Wednesdays 19:30 - 22:20 at KOLLIG 208
05L Mondays & Wednesdays 19:30 - 22:20 at KOLLIG 202
06L Tuesdays & Thursdays 19:30 - 22:20 at SCIENG 138
07L Tuesdays & Thursdays 19:30 - 22:20 at SCIENG 100
08L Mondays & Fridays 16:30 - 19:20 at KOLLIG 208

Grading	Participation activities	10%
	Project milestones	15%
	Weekly assignments	25%
	Projects (2)	50%

A+ = 99%-100%;	A = 95%-99%;	A- = 90%-95%;	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 = 0%-60%			

Policies

- All assignments will be submitted through Catcourses. No other means of submission (email, in person, etc.) will be accepted
- Late submissions will be graded at 50% unless in the case of an extreme circumstance properly documented to the instructor

- The software needed for this course (Python and MATLAB) is available to students free of charge. It is the student's responsibility to install the software on their personal computers
- Catcourses will be the principal means of official communication between the instructor and the students, so be sure to check your inbox often

Learning outcomes

By the conclusion of this course, students will be able to:

- Write computer code to implement basic engineering computations
- Formulate engineering computing problems in Python and MATLAB
- Apply algorithmic thinking to the solution of engineering computing problems
- Develop computer programs that can be used by third parties to solve engineering problems

Academic Integrity

- Each student in this course is expected to abide by the University of California Merced's Academic Honesty Policy. Any work submitted by a student in this course for academic credit will be the student's own work
- You are encouraged to study together and to discuss information and concepts covered in class with other students. You can give "consulting" help to or receive "consulting" help from such students. However, this permissible cooperation should never involve one student having possession of a copy of all or part of work done by someone else, in the form of an e-mail, an e-mail attachment file, other electronic file, or a hard copy. Should copying occur, both the student who copied work from another student and the student who gave material to be copied will automatically receive a zero for the assignment

Students with disabilities

The University of California Merced is committed to ensuring equal academic opportunities and inclusion for students with disabilities based on the principles of independent living, accessible universal design and diversity. The instructor is available to discuss appropriate academic accommodations that may be required for student with disabilities. Requests for academic accommodations are to be made during the first three weeks of the semester, except for unusual circumstances. Students are encouraged to register with Disability Services Center to verify their eligibility for appropriate accommodations.

Diversity and inclusion

This class is conducted in accordance to the UC Merced Principles of Community¹, which include the recognition and celebration of all identities, values, and beliefs. Discrimination on the basis of race, religion, sex, sexual orientation, gender identity, national origin, citizenship, documented status, or any other social identity will not be tolerated. All students are invited to discuss any situation they perceive as harmful or threatening with the instructor in class or during office hours

¹ <https://www.ucmerced.edu/principles-of-community>

Course Schedule

Every week there will be three assignments. The first one is called “knowledge check” and it is due every Sunday by midnight. The second one is called “lab assignment” and it is due every Wednesday by midnight. The third one is called “project milestone” and it is due every Friday by midnight. Knowledge checks are short questions or challenges that you will complete directly on Zybooks. Lab assignments and project milestones will instead be manually uploaded by you to Catcourses.

Project milestone assignments are designed to help you make progress on your projects in a logical and **gradual** manner. Our class projects are complex open-ended challenges that will require continuous effort on your part. **Trying to cram all the project work to the week before submission deadline will most likely lead to a significant amount of stress** for you as well as an incomplete/incorrect final result. For this reason, I have created the project milestones as a guide for your progress.

By completing these assignments on time, you will make steady progress on your project and have a clear picture of how the week's topic relates to the bigger picture. Please notice that completing the project milestone for a given week **does not mean** you are done working on your project for that week. Instead, completing this assignment means you have reached a good point from which to explore different aspects of the project and develop your own solution to the challenges I have posed.

Week	Topic
1	Introduction to Python
2	Python: branching (pre-recorded lecture for Labor Day)
3	Python: loops
4	Python: types and string operations
5	Python: lists and dictionaries
6	Python: files
7	Python: functions and modules
8	Python: review & project Q&A
9	Introduction to MATLAB. First project due on 10/24
10	MATLAB: scripts and functions
11	MATLAB: branching
12	MATLAB: loops
13	MATLAB: arrays
14	MATLAB: data visualization & GUI
15	MATLAB: Strings and character operations
16	Second project due on 12/15