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. Laboratory included

Instructor   Alejandro Gutiérrez, Ph.D.
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Office Location: COB-372
Office Hours: Wednesdays 13:00-15:00

TA   **02L** Mina Mohammadzadeh mmohammadzadeh@ucmerced.edu
03L Aidin Mahpour amahpour@ucmerced.edu
04L Mrittunjoy Sarker msarker@ucmerced.edu
05L Mohamadamin Forouzandehmehr mforouzandehmehr@ucmerced.edu
06L Ting Liu. tliu36@ucmerced.edu
07L Ziqi Liu. zliu56@ucmerced.edu

Lecture   Mondays, 13:30-15:20. COB2 110

Lab   **02L** Tuesdays & Thursdays 18:00-20:50. KOLLIG 208
03L Wednesdays & Fridays 16:30-19:20. KOLLIG 208
04L Mondays & Wednesdays 07:30-10:20. SSM 154
05L Mondays & Wednesdays 07:30-10:20. KOLLIG 208
06L Wednesdays & Fridays 11:00-13:50. KOLLIG 202
07L Tuesdays & Thursdays 07:30-10:20. SSM 154

Grading

Attendance and participation	10%
Online quizzes	10%
Labs	30%
Homeworks	20%
Projects	30%

A+ = 95%-100%;   A = 93%-94%;   A- = 90%-92%;   B+ = 87%-89%;
B = 83%-86%;   B- = 80%-82%;   C+ = 77%-79%;   C = 73%-76%;
C- = 70%-72%;   D+ = 67%-69%;   D = 63%-66%;   D- = 60%-62%;
F = 0%-59%.

Policies

- All assignments will be submitted through Catcourses. No other means of submission (email, in person, etc.) will be accepted

- Late submissions will not be accepted unless in the case of an extreme circumstance properly documented to the instructor

- The final paper is an individual assignment. This is a research-based work on a topic proposed by the student and approved by the instructor

- The software needed for this course is available on the lab PCs and the lab PCs are the primary resource for completing assignments. Students may use software installed on their own PCs and/or online compilers when available. However, ample time is available to complete assignments during lab and difficulty in using other resources will not excuse late assignments

- 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 simple computer programs that can be used by third parties to solve engineering computing 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.

- During examinations, you must do your own work. Talking or discussion is not permitted during the examinations, nor may you compare papers, copy from others, or collaborate in any way. Any collaborative behavior during the examinations will result in failure of the exam, and may lead to failure of the course and University disciplinary action

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 Community[1], 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

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[1]https://www.ucmerced.edu/principles-of-community

Course schedule

Week	Topic
08/20 - 08/24	No lecture. No lab
08/27 - 08/31	Variables, types, input. Python IDE. Matlab command window
09/03 - 09/07	No lecture (labor day holiday)
09/10 - 09/14	Loops. Nesting and counters
09/17 - 09/21	Lists and Arrays
09/24 - 09/28	Functions and arguments
10/01 - 10/05	Recursion and multiple functions. Modules
10/08 - 10/12	Functions. Classes
10/15 - 10/19	Review. First project due on 10/19
10/22 - 10/26	Pylab. Plotting in Matlab
10/29 - 11/02	Simulations. Multiplots. GUI
11/05 - 11/09	Intro to data. Curve fitting. Interpolation
11/12 - 11/16	No lecture (veterans day holiday)
11/19 - 11/23	Numerical computing. Numpy, Scipy, Matplotlib
11/26 - 11/30	Numerical computing. Equation solvers. Symbolic math
12/02 - 12/07	Review. Second project due on 12/07