CS 225 Mathematical Computing Fundamentals

Summer 2024

Course Credits: 4
Contact Hours: 56 hours
Instructor: TBA
Email: TBA

COURSE OBJECTIVES

This course serves as a comprehensive introduction to the fundamental principles of computing tailored specifically for students in the fields of Mathematics and Statistics. The primary focus is on acquainting students with the Matlab software environment, a powerful tool widely used in scientific and engineering disciplines. Through a combination of theoretical concepts and hands-on programming exercises, students will gain proficiency in utilizing Matlab for problem-solving and data analysis. Topics include loops, efficiency, debugging, Plotting in 2-D and 3-D and more.

Upon Completion of this Course, students will be able to:

1. Understand the basic features and components of the Matlab software environment;
2. Utilize Matlab for basic data manipulation and analysis tasks relevant to math and statistics;
3. Develop an understanding of control structures, including if statements and loops, and their application in Matlab programming;
4. Explore how to use functions and scripts to encapsulate and organize code;
5. Explore techniques for improving the performance of algorithms and code snippets.

PREREQUISITES

N/A

GRADING

Grades will be determined by accumulating points, with 100 points being the maximum, as follows:

ITEM	POINTS
3 Quizzes	30 Points
2 Labs	20 Points
Midterm Exam	25 Points
Final Exam	25 Points
Total	100 Points

Late submissions will be graded at the end of the course. Grades will be assigned according to the following rule:

$A \geq 90 > B \geq 80 > C \geq 70 > D \geq 60 > F$.

We reserve the right to make adjustments to the overall grading policy.

COURSE MATERIALS

Required Texts:

1. Amos Gilat, ***MATLAB: An Introduction with Applications***, 6th Edition, Wiley, 2017.
2. Holly Moore, ***MATLAB for Engineers***, 5th Edition, Pearson, 2018.

Recommended (Optional) Texts or Other Materials:

None

COURSE TOPICS

MODULE	TASKS
Module 1	**Topics:** Topic 1: Starting Matlab, Matlab Windows Topic 2: Arithmetic Operations With Scalars Topic 3: Syntax Topic 4: Useful Commands For Managing Variables **Assessments:** Quiz#1

Module 2	**Topics:** Topic 5: Numeric Data Types Topic 6: Functions with Multiple Inputs and Outputs Topic 7: Programming In Matlab Topic 8: Relational And Logical Operators **Assessments:** Lab#1: Computing Foundations Workshop
Module 3	**Topics:** Topic 9: For Loops Topic 10: Improving the Efficiency of Loops Topic 11: Matrix Operations and Functions Topic 12: Matrix Multiplication **Assessments:** Midterm Exam Quiz#2
Module 4	**Topics:** Topic 13: Polynomials And Curve Fitting Topic 14: Two-Dimensional Plots Topic 15: Three-Dimensional Plots Topic 16: Plots With Special Graphics **Assessments:** Lab#2: Problem-Solving with MATLAB
Module 5	**Topics:** Topic 17: Debugging Topic 18: Debugging Toolbar Topic 19: Sorting Values Topic 20: Generation Of Random Numbers **Assessments:** Final Exam Quiz#3

ATTENDANCE

1) Class attendance is required. Missing classes without permission will lead to decrease in overall grade.

Missing less than two classes: no penalty.

Missing more than two classes: 7% will be taken off from the overall grade.

If the instructor reports a student's frequent missing of class to the Soochow University Academic Administration Office, the student might get a written warning and might be prohibited from attending final exam.

2) Participants in this course are expected to arrive in class promptly and adequately prepared. The primary objective of this course is to critically engage with the readings and the subject matter. Therefore, course participants are expected to have completed the reading prior to class and prepare thoughtful reflections/commentaries to share with fellow colleagues.

LEARNING REQUIREMENTS

1) Late assignments are not acceptable and are subjected to grade deductions.
2) Assignments submitted in the wrong format will be counted as not submitted.
3) Failure to submit or fulfill any required course component results in failure of the class.
4) Make-up for midterm and final exams only with valid excuses, as defined by the University.
5) In order to earn a Certificate of Completion, participants must thoughtfully complete all assignments by stated deadlines and earn an average quiz score of 50% or greater.

TECHNOLOGY POLICY

The use of electronic devices in class is distracting, both for the user and for the rest of the class. Only non-programmable calculators can be used in the tests and exam. Any attempts to use cell phones and other electronic communication devices will be seemed as cheating. Laptops are discouraged, unless you use them for activities DIRECTLY related to the course (eg., note taking, reading course documents).

ACEDEMIC INTEGRITY POLICY

Soochow University highly values the academic integrity and aims to promote the academic fairness, honesty and responsibility. Any academic dishonesty behaviors and any attempts to cheats and plagiarism will be reported to the university administration office. A written warning and the relevant penalties will be imposed. The record might be shown on the official university transcript.

DISABILITY ACCOMMODATION

Soochow University is committed to maintaining a barrier-free environment so that students with disabilities can fully access programs, courses, services, and activities at Soochow University. Students with disabilities who require accommodations for access to and/or participation in this course are welcome.

Note:

Please contact the University Administrative Office immediately if you have a learning disability, a medical issue, or any other type of problem that prevents professors from seeing you have learned the course material.