MEC 102: Engineering Computing and Problem Solving

Xiaolei Yang

Spring, 2019

E-mail: xiaolei.yang@stonybrook.edu
Office Hours: TuTh 1:00PM - 2:00PM
Office: 161 Light Engineering

Phone: (631) 632-9164
Class Hours: TuTh 5:30PM - 6:50PM
Class Room: Frey Hall 102

Teaching Assistant: Zexia Zhang
Office: 1212 computer science building

Email: zexia.zhang@stonybrook.edu
Office Hours: MoWe 1:00PM - 2:00PM

Course Description

This course is intended for students with no prior programming experience who are expected to use MATLAB in science and engineering courses. This course will cover the basics of MATLAB, control structures, functions, input/output, the idea of object-oriented programming and engineering applications of MATLAB. From this class, students will be able to solve some simple engineering problems using MATLAB and feel comfortable to continue learning more advanced topics of MATLAB and other programming languages.

Prerequisites

A grade of C or better in MEC 101 or CIV 101.

Required Materials

Textbook

- MATLAB Programming for Engineers (5th Edition). Author: Stephen J. Chapman. Publisher: CENGAGE Learning.

Software

- MATLAB_R2018b.

Hardware

- Laptop for hands-on session.

Course Learning Outcomes/Objectives

Upon successful completion of this course, the students will be able to:

1. Define variables and structure programs.

2. Write commands and scripts in MATLAB

3. Create control structures (selection, repetition).

4. Create modular programs using functions.

5. Synthesize programming structures to solve practical engineering problems.

Grading Policy

The typical grading scale on blackboard will be used. The grade will count the assessments using the following proportions:

- **<u>25%</u>**: Homework.

- **<u>25%</u>**: Midterm.

- **<u>20%</u>**: Hands-on exercise.

- **<u>25%</u>**: Final project.

- **<u>5%</u>**: Class attendance.

Course Policies

During Class

Please refrain from using your laptop for anything but activities related to the class. Phones are prohibited.

Make-up Exams and Late Homework

Make-up exams are considered only for students who provide documentation of a compelling reason for missing the exam, such as doctor's certificate for medical emergency. No make-up exams for reasons that are within your control, such as pre-arranged vacation, travel, or other engagements.

Late homework will be accepted for no penalty if a valid excuse is communicated to the instructor before the deadline. After the deadline, homework will be accepted for a 50% deduction to the score up to 2 days after the deadline. After this any homework handed in will be given 0.

Attendance

For complete attendance policy, please see https://www.stonybrook.edu/commcms/registrar/policies/tracking.php. Attendance is expected in all lectures. Valid excuses for absence will be accepted before class. In extenuating circumstances, valid excuses with proof will be accepted after class.

Student Accessibility Support Center Statement

If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Student Accessibility Support Center, ECC (Educational Communications Center) Building, Room 128, (631)632-6748. They will determine with you what accommodations, if any, are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and Student Accessibility Support Center. For procedures and information go to the following website: http://www.stonybrook.edu/ehs/fire/disabilities.

Academic Integrity Statement

Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty is required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty please refer to the academic judiciary website at http://www.stonybrook.edu/commcms/academic_integrity/index.html

Critical Incident Management

Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of University Community Standards any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures. Further information about most academic matters can be found in the Undergraduate Bulletin, the Undergraduate Class Schedule, and the Faculty-Employee Handbook.

Schedule

The schedule is tentative and subject to change.

Week 01, 01/28 - 02/01: Introduction to Matlab

Week 02, 02/04 - 02/08: Linear Algebra

Week 03, 02/11 - 02/15: Matlab Fundamentals

Week 04, 02/18 - 02/22: Plotting

Week 05, 02/25 - 03/01: Control Structure

Week 06, 03/04 - 03/08: Functions

Week 07, 03/11 - 03/15: Input & Output

Week 08, 03/18 - 03/22: No Class (Spring Recess)

Week 09, 03/25 - 03/29: Midterm & Object-Oriented Programming

Week 10, 04/01 - 04/05: Statistics

Week 11, 04/08 - 04/12: Numerical Calculus

Week 12, 04/15 - 04/19: Engineering Applications

Week 13, 04/22 - 04/26: Engineering Applications

Week 14, 04/29 - 05/03: Engineering Applications

Week 15, 05/06 - 05/10: No Class, Final Project Due.