ME 2543 (Section 3) – Simulation Methods for Mechanical Engineers
Spring 2020

Lecturer
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Virtual Office Hours: Tuesday & Thursday 3:00 – 4:30pm
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Teaching assistant 1
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Teaching assistant 2
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Class Time
T/TH 1:30–2:50 pm
Location: **1225 PFTH**

Required Textbook
James B. Riggs, *Programming with MATLAB for Engineers*, Ferret Publishing, 2014.

Supplemental Reference Book
William J. Palm III, *Introduction to MATLAB for Engineers*, McGraw-Hill, 2011.
Steven Chapra, *Applied Numerical Methods with MATLAB for Engineers and Scientists 4th edition,* McGraw -Hill

Course Objectives
Provide an introduction to:
1. Structured programming for analyzing and simulating engineering problems
2. The usage of MATLAB as a programming tool
3. Numerical methods for the solution of engineering problems.

These tools will be used throughout the junior- and senior-level ME curriculum.

Tentative Course Topics
The course will be divided into the following two parts:
1. Programming Basics (Chapters 1-8 of textbook)
   - MATLAB basics
   - Variables and basic data structures
   - Logic and branching statements, iterations, and recursions
   - User-defined functions
   - Data input/output
   - Programming organization, documentation, and debugging

- Plotting data

2. Numerical Methods (Chapters 10-14 of textbook)
   - Sources of error (round-off, truncation, programmer)
   - Accuracy, convergence, stability, efficiency
   - Roots of nonlinear equations
   - System of linear and nonlinear equations
   - Interpolation and curve-fitting
   - Integration and differentiation
   - Solution of ordinary differential equations

Face mask requirements

All students, faculty and staff are required to wear a facemask or cloth. Faculty will ask students who are not wearing facemasks/cloths in the classroom to leave and they can be referred to Dean of Students for violation of the Student Code of Conduct and University Policy through the CARES system. Failure to comply would result in the student being in violation of the following, which would be addressed via the university's conduct process: LSU Student Code of Conduct: 10.2.I. Failure to Comply. Defying the order or instruction of a University official, other authorized person on behalf of the University or any University policy, contract, mandate or rule.

COVID Statement

We remain under pandemic conditions and expect to be in this state for the entire semester. In order to consistently provide the highest quality LSU education, all students should follow current LSU guidelines. These include the following:

a) If you have any signs of illness, do not come to class.
b) In order to protect all campus community members, the University requires everyone to wear facemasks/cloths on campus. Failure to do so is a violation of the code of student conduct.
c) Wash hands with soap and water or clean with sanitizer frequently, and refrain from touching your face.
d) If you have to cough or sneeze unexpectedly, please be mindful of others nearby and cough or sneeze into your elbow or shield yourself the best you can.
e) If you have been exposed to others who have tested positive for COVID19, self-quarantine consistent with current CDC guidelines.

Unexpected Changes to Courses: Due to the unpredictable nature of the situation, the format of the course and/or requirements may be forced to change, and if this is the case that students will be given appropriate notification.

Assignments

Exam 1 (Th, Feb. 18, tentative)	20%
Exam 2 (T, Mar. 23, tentative)	20%
Final exam (TBA)	20%
Homework	10%
Projects	20%
In-class exercises	10%

Exams: The use of **smart phones** (including the calculator app) during exams is **strictly prohibited**. A student caught using a smart phone will receive a zero on the exam.

Homework and projects are due one week after assigned (unless noted otherwise). Late assignments will not be accepted. Homework are to be uploaded in Matlab Grader. Instructions for preparing these assignments are going to be given in class. If you miss more than 1 homework to submit you will automatically get 0 points for all homework assignments.
Projects are to be uploaded to the course MOODLE page by the due date. Instructions for preparing these assignments will be posted in MOODLE. Students are allowed to have general discussions about assignments with each other as they formulate their solutions individually. However, work turned in should reflect your own knowledge. That is, academic honesty is expected. In-class exercises will be given to you at various times during lectures and you are expected to have the complete solution by the end of the session and will have to be uploaded in Moodle by the end of the allocated time.

This is 3 hours credit course. To be able to pass this class it is expected that you invest at least another 9 hours per-week of individual work. The secrete to being comfortable using any programming language is PRACTICE!!!!!

Plagiarism will NOT be tolerated and may result in a failing course grade and/or expulsion from the university. In fact, it is quite easy to spot plagiarized computer programs.

Class Attendance

Class attendance is expected, so you are responsible for all material discussed and presented in class. Lecture material may not directly follow the textbook. If there's a discrepancy between my class notes and the textbook, the class notes takes precedence. My notes are not available for copying. You are allowed to skip maximum 2 sessions, but you have to inform the instructor of the class beforehand. If you miss more sessions than that, **you will automatically get 0 points for all the in-class exercises.**

Regrade Policy

All questions regarding the grading of an exam (other than points being added incorrectly) are handled exclusively through written request and will only be accepted within the **first week** of the exam being returned to you (with exception of the final exam).

To submit a regrade request, include an explanation of your concerns on a separate sheet of paper. Be as specific as possible. Excuses such as *"The grade does not reflect my knowledge of the material"* or "*I'll lose a year if I fail this class*." are not legitimate reasons for a regrade and will not be entertained. Staple this sheet to the front of your assignment and submit it to me. The problem will be regraded in its **entirety** (note: a regrade might result in a lower grade).

Accessing MATLAB

Students have the following options for accessing MATLAB outside the classroom:

- You may directly access MATLAB using the computers located in the College of Engineering computer labs.

- The MATLAB campus license is called Campus-Wide License. It allows students to download and install all of the licensed products on their work and personal computers. This gives everyone unlimited access both on and off campus. All academic departments and research institutes at Louisiana State University can use the license for teaching and research. Instructions can be found here: https://in.mathworks.com/academia/tah-portal/louisiana-state-university-31463498.html

- You may purchase the Student Version of MATLAB from MathWorks. The student version runs on Windows, Mac, and Linux. Considering that you will frequently use this software throughout the ME

curriculum, it may be worth the investment. See *http://www.mathworks.com/academia/student_version* for more information.