SIE 270 Mathematical Foundations of Systems and Industrial Engineering
Spring 2022 (Revision 1)

Instructor: Savanna Silva
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Course Format: Live
Class Hours: 11:00 a.m. to 12:50 p.m. AND 3:00 p.m. to 4:10 p.m. Fridays; EB 127
Virtual Office Hours (By Appointment): M, T, W, Th: 6:00 p.m. to 8:30 p.m.

COURSE DESCRIPTION
Basics of data structures, transformations, computer methods, their implementation in MATLAB, and their applications in solving engineering problems.

PREREQUISITES
1. Calculus, Differentiation, and Integration
2. Ability to write and understand computer programs in a high-level language, such as MATLAB
3. ECE 175 or CSC 127A, MATH 129, PHYS 141

CREDIT HOURS 3

COURSE TOPICS
1. Preliminaries: Survey of Matrix Theory; Computer Number Representation and Roundoff
2. Linear Equations
3. Polynomial Interpolation
4. Numerical Differentiation and Integration
5. Solutions of Nonlinear Equations
6. Function Approximation and Data Fitting*
7. Ordinary Differential Equations, Complex Numbers, and Laplace Transforms*
8. MATLAB and Implementation

*Denotes that it is an optional course topic.

TEXTBOOK

SUPPLEMENTARY TEXT
COURSE WEBSITE
We’ll be using D2L (https://d2l.arizona.edu/). All class materials, including homework assignments, lecture notes, supplementary readings, etc. will be distributed in D2L. I will be utilizing the announcements function in D2L, please be sure to check your email at least twice a week for important updates.

HOMEWORK
Homework assignments will be posted on D2L. All homework problems will be taken directly from the main and supplementary textbooks. There will be approximately 10 homework assignments. Homework assignments are to be submitted via the drop box on D2L not later than 11:59 p.m. local time on the dates indicated.

COURSE EVALUATION
- Homework ...........................................30%
- Quizzes ................................................10%
- Attendance ..........................................5%
- Midterm Exam .................................25%
- Final Exam (Comprehensive) ..............30%
- Final Grade: A (90~100), B (80~89), C (70~79), D (50~69), E (<50)

ABSENCE AND CLASS PARTICIPATION POLICY
Participating in course and attending lectures and other course events are vital to the learning process. As such, attendance is required at all lectures and discussion section meetings. Students who miss class due to illness or emergency are required to bring documentation from their healthcare provider or other relevant, professional third parties. Failure to submit third-party documentation will result in unexcused absences.

The UA’s policy concerning Class Attendance, Participation, and Administrative Drops is available at: http://catalog.arizona.edu/2015-16/policies/classatten.htm

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, http://policy.arizona.edu/human-resources/religious-accommodation-policy.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: http://uhap.web.arizona.edu/policy/appointed-personnel/7.04.02

CLASSROOM BEHAVIOR POLICY
To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and not on extraneous activities (i.e. texting, chatting, reading a newspaper, making phone calls, web surfing, etc). Students are asked to refrain from disruptive conversations with people sitting around them during lecture. Students observed engaging in disruptive activity will be asked to cease this
behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

THREATENING BEHAVIOR POLICY
The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to one’s self. See: http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

ACCESSIBILITY AND ACCOMMODATIONS
Our goal in this classroom is that learning experiences be as accessible as possible. If you anticipate or experience physical or academic barriers based on disability, please let me know immediately so that we can discuss options. You are also welcome to contact Disability Resources (520-621-3268) to establish reasonable accommodations. For additional information on Disability Resources and reasonable accommodations, please visit http://drc.arizona.edu/. If you have reasonable accommodations, please plan to meet with me by appointment or during office hours to discuss accommodations and how my course requirements and activities may impact your ability to fully participate. Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

CODE OF ACADEMIC INTEGRITY
Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog. See: http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity.

UA NONDISCRIMINATION AND ANTI-HARASSMENT POLICY
The University is committed to creating and maintaining an environment free of discrimination, http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy

SUBJECT TO CHANGE STATEMENT
Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.