# Mathematical Foundations of Systems and Industrial Engineering
# SIE 270, Spring 2016

**Instructor:** Maryam Hamidi
**Email:** mhamidi@email.arizona.edu
**Class Meetings:** Tue-Thu 8:00-9:15, Aerospace & Mechanical Engineering, Rm S212
**Office Hours:** Tue-Thu 9:30-10:30, or by appointment, Old Engineering Building Rm 159

**Teaching Assistant:** Stephania Vasilieva
**Email:** svasilieva@email.arizona.edu
**Office Hours:** Mon-Wed 2-3 pm, or by appointment, Old Engineering Building Rm 259

## 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;
3. ENGR 170, MATH 129, PHYS 141.

## Required Textbook:
1. S. Yakowitz & F. Szidarovszky, *An Introduction to Numerical Computation* (2nd Edition), MacMillan, 1989.

## Recommended Textbook:
1. B. Hahn & D. Valentine, *Essential MATLAB for Engineers and Scientists*, (3rd Edition), Elsevier, 2007.

The book is available online.

## Grade Policy:

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|---|---|
| Homework | 20 % |
| Quizzes | 10 % |
| Two Mid-term Exams | 20% each |
| Final Exam (comprehensive) | 30% |

**Quizzes:** Every few sessions there will be a short quiz. The lowest quiz grade will be dropped, and there will be no makeup quizzes.

**Group Homework:** Homework will be posted on D2L. Assignments are due by the beginning of the next week's Thursday class. Please hand-in a hard copy in the class (preferred). For each day late 20 points (of 100) are discounted, after the third day no more submissions are allowed and the solution is posted (except for emergency university approved documented reasons).

Each group is two students. Only one copy of the homework per group will be accepted and graded. Each participating member of the team receives the same grade. You cannot change your team throughout the semester.

**Missing an Exam:** If you have a valid reason for missing an exam, please contact me a week before the exam, except when such is not possible in an emergency situation. Valid excuses include illness, serious family emergencies, or religious observance. If you are unsure of whether your excuse is valid, please discuss it with me before the exam. If you missed and exam with a valid excuse, your grade will be distributed to the rest of your exams.

**Attendance:**
Regular class attendance is essential to learn the material of this course.

**Class Website:** I will post grades and class materials on D2L. It can be accessed at `https://d2l.arizona.edu/`.

**Student Code of Integrity:**
Students are encouraged to share intellectual views and discuss 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. Note that penalty for cheating in exam is a failing grade in the course.
See: `http://deanofstudents.arizona.edu/codeofacademicintegrity/`

**Special Needs and Accommodations:**
If you need any accommodations to help you perform better in this class, you should contact the Disability Resources Center `http://drc.arizona.edu/`. You must register and request that the Center or DRC send me official notification of your accommodations needs.

**Other Information:**
You are welcome to show up to office hours if you have questions. If you cannot make office hours after class, we can schedule another time. It's my job to help you understand the material, and if you are having problems I want to help.

**Tentative Course Outline**:

| Chapter # | Chapter Title |
|---|---|
| Chapter 1 | • Preliminaries; Survey of Matrix Theory |
| Chapter 2 | • Linear Equations |
| Chapter 3 | • Polynomial Interpolation |
| Chapter 4 | • Numerical Differentiation & Integration |
| Chapter 5 | • Solution of Nonlinear Equations |
| Chapter 6 | • Data Fitting |
| Chapter 7 | • Complex Numbers |
| Chapter 8 | • Laplace Transforms |

**Note:** I reserve the right to make minor changes to course policies and the syllabus.