



## SIE 270: Fundamentals of Optimization Spring 2017

**Time and Location:** Tues and Thur, 8:00am-9:15am, Aero & Mech Engr, Rm S212

**Instructor:** Jianqiang Cheng   **Email:** jqcheng@email.arizona.edu

**Office Location:** ENGR 123

**Office Hours:** Tues and Thur, 9:30am-10:45am, or by appointment

**Teaching Assistant:** Sara Minaeian   **Email:** minaeian@email.arizona.edu

**Office Location:** ENGR 162

**Office Hours:** Tues and Wed, 11:00am-12:00pm, or by appointment

**Grader:** Regdy Vera Caicedo   **Email:** rvera1@email.arizona.edu

**Course Description:** Basics of data structures, transformations, computer methods, their implementation in MATLAB, and their applications in solving engineering problems.

### Prerequisite(s):

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

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

**Supplementary:** B. Hahn & D. Valentine, Essential MATLAB for Engineers and Scientists, (5th Edition), Elsevier, 2013. (The book is available

online.)

**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 also be sending emails to the whole class throughout the semester using the classlist in D2L. You must check the announcements in D2L and your email at least twice a week.

**Course Topics (subject to change):**

1. Preliminaries: Data Structure, Matrix Theory
2. Linear Equations
3. Polynomial Interpolation
4. Numerical Differentiation and Integration
5. Solutions of Nonlinear Equations
6. Data Fitting
7. Ordinary Differential Equations
8. Complex Numbers and Laplace Transforms (\*)

**Course Requirements:**

- Lectures: Students are expected to attend and participate in all lectures. Lecture materials will be posted in D2L. Some questions left in lectures will require you study by yourself.
- Reading: Reading materials from textbook or supplementary posted in D2L will be mentioned at the end of lecture notes. Students are responsible for completing these readings.
- Homework: There will be about 8-10 problem sets. Homework and its due date will be posted on D2L. Please hand in a hard copy in the class (preferred) expect for the on-line students.

**Late submission:** A late fee of 10% of the grade is imposed for each day (or part of a day) that an assignment is late. No grade is awarded if the work is submitted after the solutions have been posted on the web. Late submissions must be turned in directly to the TA.

**Grading distribution:**

Homework: 20%

Quizzes and Attendance: 10% (Random choice of time)

In-class Midterm exam 1 (75-minute limit): 20%

In-class Midterm exam 2 (75-minute limit): 20%

Final exam: 30% 8:00am - 10:00am, Thursday, 5/11/2017

**Note:** For questions on grades, you have to talk to teaching assistant or the instructor within one week of grades posted.

**Final Grade:** A (90-100), B (80-89), C (70-79), D (60-69), E (< 60)

**Academic integrity policy:** All students are expected to commit themselves to be honest in all academic work and understand that failure to comply with this commitment will result in disciplinary action. This is a reminder to uphold your obligation as a UA student and to be honest in all work submitted and exams taken in this course and all others.

You are encouraged to make recommendations to improve the class and my teaching skills.

**Note:** This syllabus is tentative and the instructor reserves the right to make modifications if appropriate.