



# Math 320 Introduction to Mathematical Computation



### Lecture Hours

MW 14:30-15:45 PM  
in MH-452

### Instructor

Dr. Charles H. Lee

### Office

MH 182 E

### Office Hours

MW 1:30-2:20PM

### Phone

567-278-2726

### E-mail

charleshlee@fullerton.edu

### URL

newton.fullerton.edu

### Text Book

**MATLAB:** *An Introduction with Applications*,  
Amos Gilat, 6th Edition  
by John Wiley & Son  
2017

**Withdrawal deadlines:**  
Sep 29 (no doc. required)  
Nov 09 (doc. required)

**Class Attendance/ Participation (CAP):**  
Make every effort to be in class on time. Perfect attendance and actively participating in class will earn you 100 CAP points. You are allowed to have one absence. Each absence thereafter will cost you 5 points. Being tardy twice is equivalent to one absence.

**Software:** It's recommended that you purchase and install on your computer a student version of MATLAB for this course.

**Course Goal:** This course is intended to help you become comfortable using personal computers to solve quantitative problems, as well as to experiment with mathematical concepts and techniques. A variety of problems from mathematics, science and engineering will be considered to illustrate the problem-solving process. In addition, various topics from the four-semester calculus and linear algebra sequence will be studied from a computational viewpoint. You will gain experience in the use of MATLAB, a state-of-the-art software package for interactive numerical and symbolic computation, as well as in writing programs of your own. What you learn will prove to be useful in many of your future courses in mathematics, particularly those involving numerical computation, mathematical modeling, and simulation. The skills you will develop here are also invaluable for **any** career in mathematics, science or engineering, including teaching.

### Important Remarks

- ♦ Know your nearest emergency exit. In the event of a fire or an earthquake emergency, take all your personal belongings, leave the building, go to the lawn areas on Nutwood Avenue, and stay with class members. **Do not use the elevator.**
- ♦ Students who violate university standards of academic integrity are subject to disciplinary sanctions, including failure in the course and suspension from the university. Since dishonesty in any form harms the individual, other students and the university, policies on academic integrity are strictly enforced. Academic dishonesty violations include, but are not limited to, copying from another student's homework, term paper, or exam, possessing or using unauthorized materials during the exam, or allowing another student to copy your work.

### Homework

- There are 15 homework assignments. List with the course schedule. Assignments are equally weighted. One lowest score will be dropped.
- Homework must be carried step by step. Solutions alone are not acceptable.
- Homework is due weekly on Wednesday before class. No late homework will be accepted.
- To guarantee your work are promptly graded and returned, NO late homework will be accepted.

### Exams

- There will be 2 midterms and a final comprehensive exam.
- **NO** make-up exams except in very special circumstances.

Exam I—Ch. 1-3 Ch. 1-5	Wed— 09/27/17
Exam I—Ch. 1-6	Wed— 10/25/17
Comprehensive Final Exam	Wed— 12/13/17

### Grade Distribution

Homework	10%
Quizzes & In-Class Assignments	10%
Midterm Exam I	20%
Midterm Exam II	20%
CAP	5%
Final Exam	35%
Total	100%

### Grade Scale

93%-100%	A
90%-92.9%	A-
87%-89.9%	B+
83%-86.9%	B
80%-82.9%	B-
77%-79.9%	C+
70%-76.9%	C
60%-69.9%	D
0%-59.9%	F

# Course Schedule



Math 320 — Introduction to Mathematical Computation — Fall 2017 — Dr. Charles H. Lee

Week of		Monday	Wednesday	Homework
08/21/17	08/23/17	1.1 Starting MATLAB, MATLAB windows 1.2 Working in the command window 1.3 Arithmetic operations with scalars	1.4 Display formats 1.5 Elementary math built-in functions 1.6 Defining scalar variables	<b>Due Weekly on Wednesday</b>
08/28/17	08/30/17	1.7 Useful commands for managing variables 1.8 Script files 1.9 Examples of MATLAB Applications	2.1 Creating a one dimensional array (vector) 2.2 Creating a 2 dimensional array (matrix) 2.3 Notes about variables in MATLAB	<b>HW-1</b> Ch. 1: 1-20 (even)
09/04/17	09/06/17	<b>Labor Day</b>	2.4 The transpose operator 2.5 Array addressing 2.6 Using a colon: in addressing arrays 2.7 Adding elements to existing variables	<b>HW-2</b> Ch. 1: 20-40 (even) Ch. 2: 2-10 (even)
09/11/17	09/13/17	2.8 Deleting elements to existing variables 2.9 Built-in functions for handling arrays 2.10 Strings and strings as variables 3.1 Addition and subtraction	3.2 Array multiplication 3.3 Array division 3.4 Element-by-element operations 3.5 Using arrays in MATLAB built-in functions	<b>HW-3</b> Ch. 2: 20-30 (even) Ch. 2: 31-37 (part a)
09/18/17	09/20/17	3.6 Built-in functions for analyzing arrays 3.7 Generation of random numbers 3.8 Examples of MATLAB Applications	4.1 Workspace and workspace window 4.2 Input to a script file 4.3 Output commands	<b>HW-4</b> Ch. 2: 38-44 (even) Ch. 3: 4, 8, 12, 16, 20
09/25/17	09/27/17	4.4 The save and load commands 4.5 Importing and exporting data 4.6 Examples of MATLAB Applications	<b>Midterm Exam I</b> (Chapter 1-3)	<b>HW-5</b> Ch. 3: 24, 28, 32, 36 Ch. 4: 1, 3, 5, 7, 9
10/02/17	10/04/17	5.1 The plot command 5.2 The fplot command 5.3 Plotting multiple graphs in the same plot	5.4 Formatting a plot 5.5 Plots with logarithmic axes 5.6 Plots with error bars 5.7 Plots with special graphics	<b>HW-6</b> Ch. 4: 11, 15, 19, 23, 27
10/09/17	10/11/17	5.8 Histograms & 5.9 Polar plots 5.10 Plotting multiple plots on the same page 5.11 Multiple figure windows 5.12 Examples of MATLAB Applications	5.8 Histograms & 5.9 Polar plots 5.10 Plotting multiple plots on the same page 5.11 Multiple figure windows 5.12 Examples of MATLAB Applications	<b>HW-7</b> Ch. 5: 1-20 (even)
10/16/17	10/18/17	6.1 Relational and logical operators 6.2 Conditional statements 6.3 The switch-case statement 6.4 Loops	6.5 Nested loops, nested conditional statements 6.6 The break and continue commands 6.7 Examples of MATLAB Applications	<b>HW-8</b> Ch. 5: 24, 28, 32, 36, 40
10/23/17	10/25/17	7.1 Creating a function file 7.2 Structure of a function file 7.3 Local and global variables	<b>Midterm Exam II</b> (Chapter 4-6)	<b>HW-9</b> Ch. 6: 1, 3, 5, 7, 9, 11 Ch. 6: 16, 20, 24, 28, 32
10/30/17	11/01/17	7.4 Saving a function file 7.5 Using a user-defined function 7.6 Examples of simple user-defined functions	7.7 Comparison between script/function files 7.8 Anonymous and inline functions 7.9 Function functions	<b>HW-10</b> Ch. 7: 1, 5, 9, 13
11/06/17	11/08/17	7.10 Subfunctions 7.11 Nested functions 7.12 Examples of MATLAB Applications	8.1 Polynomials 8.2 Curve fitting 8.3 Interpolation	<b>HW-11</b> Ch. 7: 17, 21, 25, 29, 33
11/13/17	11/15/17	8.4 The basic fitting interface 8.5 Examples of MATLAB Applications	9.1 Line plots 9.2 Mesh and surface plots 9.3 Plots with special graphics 9.4 The view command	<b>HW-12</b> Ch. 8: 5, 10, ..., 35
11/20/17	11/22/17	<b>Fall Recess</b>	<b>Fall Recess</b>	
11/27/17	11/29/17	10.1 Solving an equation with one variable 10.2 Finding min/max of a function 10.3 Numerical integration 10.4 Ordinary differential equations	11.1 Symbolic Objects & Expressions 11.2 Symbolic Manipulations 11.3 Solving Algebraic Equations	<b>HW-13</b> Ch. 9: 5, 10, ... 40
12/04/17	12/06/17	11.4 Differentiation 11.5 Integration 11.6 Solving ODEs	11.7 Plotting Symbolic Expressions 11.8 Num. Calculations of Symbolic Expressions 11.9 Examples of MATLAB Applications	<b>HW-14</b> Ch. 10: 1, 5, 9, 13, 17, 21 Ch. 11: 2-12 (even)
12/11/17	12/13/17		<b>Comprehensive Final Exam</b> 2:30PM-4:20PM	<b>HW-15</b> Ch. 11: 14-24 (even)