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**Office Hours:** TW 1:30-2:30;  
**Office:** Exploratory Hall 4205

**Text and Materials:** Finite Mathematics and Its Applications, 12th Edition, by Goldstein, Schneider and Siegel, Pearson 2017

Math 111 Data Fitting Notes – available on Blackboard

**Expo** Bold Dry-erase markers

Expo whiteboard eraser or black sock

**Course Description:** This course meets the quantitative reasoning requirement, one of the Foundation requirements of the Mason Core. The goal of the Foundation requirement is to help ensure that students are equipped with the tools and techniques necessary to succeed in college and throughout their lives and careers. We will cover the following topics:

- Linear Equations
- Linear Systems and Matrices
- Leontiff Input/Output Analysis
- Markov Processes
- Data Fitting - Polynomial Interpolation, Least Squares
- Difference Equations

**Active Learning with Technology Classroom:** I chose this classroom for Math 111 because the space facilitates active learning and collaboration.

Students will be able to try problem solving skills and procedures immediately after being introduced to them. Eliminating the time gap between the introduction of a skill and the first individual attempt (usually homework several hours later) will provide the opportunity for better retention of the mathematical concepts introduced in the course.

The circular seating arrangement allows for comparing, sharing and discussing results. This approach is beneficial to everyone. The students who understand a concept can reinforce their understanding by explaining it others. On the other hand, students who are not confident with a certain skill can get assistance from their tablemates.

### **Student Expectations**

- Attendance- you are expected to attend every class. There will be collected/graded work on most class days.
- Preparation- you are expected to be prepared for class. The preparation includes doing homework problems and reading the textbook. There will also be videos posted on blackboard that can be used for review and reinforcement. Please check the Math 111 Blackboard the night before **each class** for announcements and other information.
- Collaboration – I am requesting that you help other students at your table when it is appropriate. However, keep in mind that not all exercises will allow for collaboration. For instance, tests are individual efforts and sharing information about them is prohibited. Please don't hesitate to ask if you are not clear whether or not collaboration is permitted.

**Final Exam:** Wednesday, December 13 at 10:30am-1:15pm

**Tests:**

**Test 1:** Monday September 25

**Test 2:** Monday October 30

**Test 3:** Monday December 4

**Grading:** Your grade for the course will be calculated based on three exams, collected class work, and a final exam. Matlab assignments will be worth 25 points each (total 100). Each test is worth 100 points, class work will total 100 points, and the final exam 100 points. The sum of these grades divided by 6 will determine your grade according to the scale:

A: 90-100 B: 80-89.9 C:70-79.9 D:65-69.9 F: below 65

+ or - will be attached to the grade for the upper or lower 2 points in each range

NO make-up tests or class work will be given. If you miss an exam contact me ASAP.

**Homework:** Homework problems will be assigned at the end of each class and presented at the beginning of the next class meeting by students. Reading the sections of the text related to the problems is a part of the homework assignment. I will post the assignment regularly on the course Blackboard.

**Calculators:** You will need a calculator for class work, homework, and exams. Our textbook includes notes on the use of TI-83/84. You are not required to get this particular calculator but if you have one, feel free to use it. Matrix computations on graded class work and exams are to be **done by hand**.

**Honor Code:** Sharing information of any kind about exams is an Honor Code violation. The assigned *Matlab* problems are NOT GROUP PROJECTS. Each student is to work independently at the computer terminal and hand in his or her own computer printout. Any violations will be referred to the Office of Academic Integrity.

**Disability statement:** If you are a student with a disability and you need academic accommodations, please see me and contact the Office of Disability Services at 703-993-2474. All academic accommodations must be arranged through that office.

**Computers:** We will be using *Matlab* to help with matrix calculations. This software is available for student use either on campus or remotely on mason.gmu.edu. The system requires your Patriot Pass. Details for connecting will be available on Blackboard. There are computer labs in the Johnson Center in rooms 342 and in Innovation Hall 301. For open hours see

<http://doit.gmu.edu/faculty-and-staff/computer-labs/computer-lab-locations/>

**General Remarks:** Please be considerate of other students in the class. Turn your cell phones off before entering the classroom and keep the noise level at a minimum. Be respectful of other students in the class. We all have different experiences in Mathematics. What is easy for one person may be monumental for another.

**My responsibility** as the instructor of this course is to answer questions and organize the material in a logical manner to facilitate learning. **Your job** as the student is to attend every class, arrive on time and be attentive, meet deadlines and be responsible for your learning.

The following is a tentative schedule for the course:

<b>M</b>	<b>W</b>
Aug. 28: Sec 1.1 Linear Models and Graphs	Aug. 30: Sec 1.3, Sec 1.4 Linear Systems; Slope of a line
Sept: 4: Labor Day (no class)	Sept. 6: Sec 1.4, 2.1 Writing a Linear Equation; Intro to Matrix method of solving systems.
Sept. 11: Sec 2.1 Matrix Method of solving systems of Equations; Row Operations	Sept. 13: Sec 2.2 Gaussian Elimination
Sept 18: Sec 2.3 Matrix Operations: Scalar Multiplication and Addition	Sept. 20: Sec 2.3 Matrix Multiplication
Sept. 25: <b>Test 1</b>	Sept. 27: Sec 2.4 Inverse of a Matrix
Oct. 2: Introduction to Matlab	Oct. 4: Sec 2.4 Matrix Equations
Tuesday Oct 10: Sec 2.5, 2.6 Gauss-Jordan Method of finding Inverses	Oct. 11: Sec 2.6 Leontiff Input-Output Analysis
Oct. 16: Sec 8.1 Markov Processes	Oct. 18: Sec 8.2 Processes with Stable Distributions
Oct. 23: Sec 8.3 Absorbing States and Absorbing Matrices	Oct. 25: Chapter 8 Problems
Oct. 30: <b>Test 2</b>	Nov. 1: Sec 1.5 Method of Least Squares
Nov. 6: Data Fitting Models	Nov. 8: Data Fitting Polynomial Interpolation
Nov. 13: Data Fitting Least Squares	Nov. 15: Data Fitting Exponential Model
Nov. 20: Data Fitting Power Law Model	Nov. 22: Thanksgiving Break
Nov. 27: Sec 11.1 Introduction to Difference Equations	Nov. 29: Sec 11.2; 11.3 Difference Equations as models; Properties of Difference Equation Graphs
Dec. 4: <b>Test 3</b>	Dec. 6: Sec 11.3 Graphing Difference Equations
Dec. 11: No Class	Dec. 13: <b>Final Exam</b> <b>10:30-1:15</b>

- September 29 is last day to drop
- October 2 – October 27 is the Selective withdrawal period

## **Class Structure**

### **Table Folder**

Each table will have a folder containing:

- List of students
- Name of Table Leader
- Names of two students who will present homework problems
- Handouts

### **Table Leader**

- Gets 2 points
- Will be in charge of the table folder
- Takes attendance
- Notifies the two homework presenters which problem they will display on whiteboard
- Pass out any handouts at the appropriate time (i.e, when I announce it)

### **HW Presentations**

- Two presenters at each table are identified on the cover sheet of the table folder
- The specific problems to be presented are indicated there as well
- Presenter gets 2 points
- Presenter writes on whiteboard using the following format:
  - Name
  - Page Number/Section number
  - Problem number
  - Complete solution

### **Class structure**

Each class will be divided into 3 time periods (20-25-30 minutes each)

#### **I Homework Presentation**

Two students from each table will present problems designated on cover sheet. Table members will review the work for correctness. The presenter stays with the solution to answer questions while the other students do a gallery walk. They look at other HW solutions and find any solutions that they had trouble with.

#### **II New Material**

Delivered in various formats: mini lecture, powerpoint, video demonstration

#### **III Practice/Classwork**

- Up to 3 points for practice/classwork. Points are based on correctness
- Various formats: whiteboard work, collected work, individual and/or group