

# MAT 183 - Elements of Modern Mathematics

## Syllabus for Summer Session I 2015

**Class Meetings:** MoTuWeTh 2:00PM – 4:25PM  
Hall of Languages 102

**Course Instructor:** Xiaoxia (Alice) Liu  
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Office: Archbold 103C  
Office hours: TuWe 11:00AM – 12:00PM, or by appointment

**Course Description:** This course is designed for students in the School of Management. The course will involve no calculus, and a thorough background in high school mathematics is the only prerequisite. The course has three main components: Linear Algebra, Probability & Statistics, and the Mathematics of Finance.

**Textbook:** Goldstein, Schneider, and Siegel (2004). *Finite Mathematics and its Applications (2nd custom ed.)*. Prentice Hall, Custom Edition for Syracuse University.

**Calculator:** This course involves extensive use of the TI-84 graphing calculator. Each student is required to own a TI-84 calculator. The calculator will prove to be an indispensable tool throughout the course, particularly in the Mathematics of Finance component. Since the TI-84 will be useful, if not essential, for virtually every topic, it is important to familiarize yourself with the calculator as soon as possible. Though the main techniques will be demonstrated in class, it is up to you to become proficient with the calculator on your own. **The TI-84 is the only calculator that may be used on a test without prior approval from your instructor. In particular, calculators on cell phones are not to be used on tests or quizzes.**

**Quizzes and Homework:** There will be regular quizzes. Quizzes will be announced ahead of time. There will be no make-up for quizzes. One lowest quiz score will be dropped. Homework will be assigned regularly and be collected at the beginning of the next class. One lowest homework score will be dropped.

**Attendance and Class Preparation:** Students are expected to attend every lecture and are responsible for any announcements made during lecture. Students should read the appropriate sections of the textbook before the class in which the material is presented.

**Tests:** A missed exam, **with a valid excuse**, can be made up by the end of the fourth class following the exam. Otherwise, it will become a zero.

**DO NOT PLAN TO LEAVE CAMPUS BEFORE JUNE 25!**

**HELP!** The main lecturer will hold regular office hours. The times and places will be listed on Blackboard. In addition, the Mathematics Department offers regular math clinics. A schedule of clinic hours will be available in the math office, 215 Carnegie and on the math website: [math.syr.edu/Help.htm](http://math.syr.edu/Help.htm).

**Other Problems:** These should be resolved with your instructor. Problems that cannot be resolved with your instructor should be referred to the **course supervisor**, Prof. Graham J. Leuschke, [gjleusch@syr.edu](mailto:gjleusch@syr.edu).

**Learning Outcomes:**

- The ability to select an appropriate mathematical model for a given real world problem;
- The ability to understand and enunciate the limitations of conclusions drawn from mathematical models;
- The ability to effectively use appropriate mathematical technology;
- A mastery of the basic properties of matrices and the ability to solve simple matrix equations;
- A mastery of the basic properties and formulas of probability and statistics and the ability to compute simple probabilities in a statistical setting and to interpret the results;
- A mastery of the basic formulas from the mathematics of finance and the ability to apply these formulas in a variety of settings that arise in personal finance.

## Grading Policy

The grade for this course will primarily be based on the student's performance on the three tests.

Test 1: Linear Algebra & Counting	25%
Test 2: Probability & Statistics	25%
Test 3: Markov Processes & Finance	25%
Homework & Quizzes	20%
Participation	5%

Letter grades will be assigned as follows:

A	93-100%	B+	87-89%	C+	77-79%	D	65-69%
A-	90-92%	B	83-86%	C	73-76%	F	0-64%
		B-	80-82%	C-	70-72%		

## College and Department Policy Statements

**Getting Help:** Your instructor will be holding regular office hours and will make appointments with students having class conflicts with their scheduled office hours. In addition, the Mathematics Department offers regular math clinics. These will be set up by the second week of the semester and a schedule of the clinics will be posted outside the math office.

**Cell Phones:** All electronic devices other than the calculator should be turned off and put away during class. Calculators on cell phones are not to be used on tests or quizzes.

**Students with Disabilities:** If you believe that you need accommodations for a disability, please contact the Office of Disability Services (ODS), <http://disabilityservices.syr.edu>, located in Room 309 of 804 University Avenue, or call (315) 443-4498 for an appointment to discuss your needs and the process for requesting accommodations. ODS is responsible for coordinating disability-related accommodations and will issue students with documented disabilities Accommodation Authorization Letters, as appropriate. Since accommodations may require early planning and generally are not provided retroactively, please contact ODS as soon as possible. You are also welcome to contact me privately to discuss your academic needs although I cannot arrange for disability-related accommodations. Making arrangements with ODS takes time. Do not wait until just before the first test.

**Academic Integrity:** The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work they submit. Students should be familiar with the Policy and know that it is their responsibility to learn about instructor and general academic expectations with regard to proper citation of sources in written work. The policy also governs the integrity of work submitted in exams and assignments as well as the veracity of signatures on attendance sheets and other verifications of participation in class activities. Serious sanctions can result from academic dishonesty of any sort. For more information and the complete policy, see <http://academicintegrity.syr.edu>.

**Religious Observances Policy:** SU religious observances policy recognizes the diversity of faiths represented among the campus community and protects the rights of students, faculty, and staff to observe religious holidays according to their tradition. Under the policy, students are provided an opportunity to make up any examination, study, or work requirements that may be missed due to are religious observance provided they notify their instructors before the end of the second week of classes. For fall and spring semesters, an online notification process is available through MySlice (Student Services - > Enrollment -> My Religious Observances) from the first day of class until the end of the second week of class.

Related link: [http://supolicies.syr.edu/studs/religious\\_observance.htm](http://supolicies.syr.edu/studs/religious_observance.htm)

## Tentative Calendar

This calendar is subject to change.

	Mon	Tues	Wed	Thu
<b>Week 1</b>	5/18	5/19	5/20	5/21
	2.3, 2.1	2.2, 2.4	2.6, 5.1	5.2-5.4
<b>Week 2</b>	5/25	5/26	5/27	5/28
	Memorial Day	5.4, 5.5	5.6 & Review	<b>Test 1</b>
<b>Week 3</b>	6/1	6/2	6/3	6/4
	6.1-6.3	6.4, 6.5	6.5, 6.6	7.1-7.3
<b>Week 4</b>	6/8	6/9	6/10	6/11
	7.3-7.5	7.6, 7.7	Review	<b>Test 2</b>
<b>Week 5</b>	6/15	6/16	6/17	6/18
	8.1	8.2	8.3	10.1, 10.2
<b>Week 6</b>	6/22	6/23	6/24	6/25
	10.3	10.3, 10.4	Review	<b>Test 3</b>

## Important Dates

<b>First day of classes:</b>	May 18
<b>Add class deadline:</b>	May 20
<b>Pass/fail or audit:</b>	May 21
<b>Financial drop deadline:</b>	May 26
<b>Academic drop deadline:</b>	June 10
<b>Withdrawal deadline:</b>	June 19
<b>Last day of classes:</b>	June 26

## Exercises

The following exercises from the textbook are selected to help the student understand the material.

### Linear Algebra

- 2.1 17, 19, 25, 27, 31, 37, 38
- 2.2 9, 15, 23, 26, 27, 30, 35, 36
- 2.3 7, 15, 17, 21, 26, 33, 37, 43, 46, 47, 49, 51
- 2.4 11, 15, 16, 17, 19, 27, 31
- 2.6 5, 7, 8, 12, 13, 16, 19

### Counting

- 5.2 2, 3, 5, 9, 11, 13, 15, 17
- 5.3 5, 7, 13, 15, 17, 19, 23, 25, 41, 43, 45
- 5.4 11, 17, 19, 23, 24, 25, 31, 33, 37
- 5.5 5, 7, 11, 21, 25, 27, 32, 34, 38, 41, 52, 59, 76
- 5.6 1, 3, 5, 7, 9, 10, 11, 17, 19, 23, 30, 31, 36, 46

### Probability

- 6.2 1, 3, 7, 9, 11, 15, 19, 24
- 6.3 2, 3, 4, 7, 10, 17, 19, 23
- 6.4 1, 3, 9, 13, 15, 17, 19, 21, 22, 35, 36
- 6.5 1, 2, 3, 4, 6, 7, 10, 12, 13, 15, 17, 22, 23, 30, 39
- 6.6 4, 6, 7, 8, 13, 15, 20, 24

### Statistics

- 7.2 1, 7, 9, 10, 22
- 7.3 1, 3, 5, 7, 10, 12, 19
- 7.4 2, 9, 10, 11, 12, 16, 24, 26
- 7.5 1, 3, 7, 8, 11, 12, 13
- 7.6 1, 3, 5, 7, 25, 26, 31, 33

### Markov Processes

- 8.1 1, 7, 9, 10, 11, 13, 14, 15
- 8.2 1, 5, 7, 14, 15, 16, 18
- 8.3 3, 5, 7, 12, 13, 14, 15, 16, 17

### Mathematics of Finance

- 10.1 1, 4, 6, 8, 11, 15, 19, 23, 37, 40, 49
- 10.2 1, 4, 7, 9, 11, 14, 17, 19, 21, 25, 36, 41
- 10.3 1, 2, 3, 5, 7, 11, 17, 20, 21, 27
- 10.4 3, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, 30, 32, 34, 36, 38, 42, 44, 46, 48