

MAT 183 - Elements of Modern Mathematics

Syllabus Spring 2010

Section 100, TTh 11:00-12:20, Heroy Auditorium

Course Instructor: Prof. Claudia Miller

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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 Theory, and Mathematics of Finance.

Text: 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 (or TI-83) graphing calculator. Each student is required to own a TI-84 or TI-83 calculator. The calculator will prove to be an indispensable tool throughout the course, particularly in the Mathematics of Finance component. Since the TI-83/84 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 and TI-83 are the only calculators that may be used on a test or the final exam** without prior approval from your instructor.

Electronic Devices: No electronic device other than the TI-83/84 may be used on any quiz, test, or final exam. During class, all electronic devices other than the TI83/84 should be turned off and put away.

Quizzes: There will generally be *weekly quizzes* in the recitation sections.

Homework: Homework will be done *online* using WebAssign at:

www.webassign.net

You are required to purchase your entry code for this online system – it is bundled with the custom edition of the text. In addition, you will need the class key code, which will be given to you on the first day of class.

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

Tests: There will be NO makeup tests. For students with an EXCUSED absence, the portion of the final exam corresponding to the missed test will be substituted for the missing score.

Final Exam: The final exam will be given on **Monday, May 10**, in a two-hour block between 8:00 am and 2:30pm, exact time and location to be announced later in the term. **Every student must take the exam at that time - no exceptions!**

DO NOT PLAN TO LEAVE TOWN BEFORE 2:30 pm on May 10, 2010!

HELP! The main lecturer and your recitation instructor will hold regular office hours. In addition, a Math Help Clinic is held in the large reading room on the 2nd floor of Carnegie Hall. 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 215 Carnegie.

Other Problems: Please inform your instructor of any problems that you have with this course. Problems not satisfactorily resolved with your instructor should be brought to the attention of the **course supervisor** without delay: Prof. Claudia Miller; 314D Carnegie; Ext: 1493; clamille@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.

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://academic.integrity.syr.edu>

Grading Policy

Your final grade for this course will be based on the final exam, three tests, quizzes and homework, as follows:

Test 1 (Linear Algebra & Counting)	20%
Test 2 (Probability & Statistics)	20%
Test 3 (Mathematics of Finance)	20%
Final Exam	25%
Quizzes and Homework	15%

Test and Exam scores will NOT be curved. Letter grades will be assigned as follows:

A	93-100%	B+	87-90%	C+	77-80%	D	65-70%
A-	90-93%	B	83-87%	C	73-77%	F	0-65%
		B-	80-83%	C-	70-73%		

Tentative Calendar

Dates	Topics
Jan 19, Jan 21	2.1, 2.2, 2.3
Jan 26, Jan 28	2.4, 2.6
Feb 2, Feb 4	5.2, 5.3, 5.4
Feb 9, Feb 11	5.5, 5.6, Review
Feb 16, Feb 18	Test 1, 6.2, 6.3
Feb 23, Feb 25	6.4, 6.5
Mar 2, Mar 4	6.6, 7.2, 7.3
Mar 9, Mar 11	7.4, 7.5
Mar 16, Mar 18	SPRING BREAK
Mar 23, Mar 25	7.6, Review, Test 2
Mar 30, Apr 1	7.6, 8.1
Apr 6, Apr 8	8.2, 8.3
Apr 13, Apr 15	10.1, 10.2
Apr 20, Apr 22	10.3, 10.4
Apr 27, Apr 29	Review, Test 3
May 4	Review

EXERCISES

The following exercises from the text are selected to help the student understand the material. Problems in WebAssign will be similar to problems in this list.

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, 52*
- 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, 27*, 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