MAT 183 - Elements of Modern Mathematics

Syllabus Fall 2009

Section 100, TTh 2:00-3:20; Section 200, MW 2:15-3:35; Section 300, MW 3:45-5:05

Course Instructors		**email**	**office**	**ext**
Chapters 2 and 7:	**Elizabeth Hartung**	ejhartun@syr.edu	400 Carnegie	2163
Chapters 5 and 8:	**Ashley Prater**	aaprater@syr.edu	400 Carnegie	2163
Chapters 6 and 10:	**Jack Graver**	jegraver@syr.edu	229E Physics	1576

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* (2^{nd} 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 TI84 calculator. The calculator will prove to be an indispensable tool throughout the course, particularly in the Mathematics of Finance component. Since the TI84 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 or the final exam** without prior approval from your instructor.

Cell Phones: all electronic devices other than the TI84 should be turned off and put away during class. Calculators on cell phones are not to be used on tests or quizzes.

Quizzes and Homework: There will be ***weekly quizzes*** in the recitation sections. ***Homework will be done online*** using WebAssign. You are required to purchase your entry code for this online system – it is bundled with the custom edition of the text. WebAssign problems for a section will be opened the day that section is covered in class; they will be discussed during the following week's recitations and will be due at 11.59pm of the Saturday of the following week (extensions only for an EXTENDED illness).

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. The FINAL exam will be given on **Wednesday, December 16. Every student must take the exam at that time - no exceptions!**

DO NOT PLAN TO LEAVE TOWN BEFORE DECEMBER 16!

HELP! The main lecturers and your recitation instructor will hold regular office hours. The times and places will be listed on Blackboard. In addition, the Mathematics Department offers regular math clinics. These will start the second week of classes and will be held in the reading room of Carnegie. A schedule of clinic hours will be available in the math office., 215 Carnegie.

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. Jack Graver; 229E Physics; *Ext:* 1576; jegraver@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.

Academic Integrity: The Syracuse University Academic Integrity Policy holds students accountable for the integrity of the work that 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 verification of participation in class activities.

Disability-Related Academic Accommodations. Students who are in need of disability-related academic accommodations must register with ODS, the Office of Disability Services, 804 University Ave., Room 309, 315-443-4498. Students with authorized disability-related accommodations must provide a current Accommodation Authorization Letter from ODS to the instructor and review those accommodations with the instructor. Accommodations, such as exam administration are not provided retroactively; therefore, planning for accommodations as early as possible is necessary.

Grading Policy

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

Test 1: Linear Algebra & Counting	20%	Final Exam	25%
Test 2: Probability & Statistics	20%	Quizzes	06%
Test 3: Mathematics of Finance	20%	Homework	09%

Test and Exam scores will NOT be curved. 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%		

Tentative Calendar

Sunday	Monday	Tuesday	Wednesday	Thursday
Aug 30	Class 1	2.1, 2.2	Class 2	2.3, 2.4
Sept 6	NO CLASS*	Class 3	2.6	NO CLASS*
Sept 13	Class 4	5.2, 5.3	Class 5	5.3, 5.4
Sept 20	NO CLASS*	Class 6	5.5, 5.6	NO CLASS*
Sept 27	NO CLASS*	Class 7	Review	NO CLASS*
Oct 4	TEST #1		Class 9	6.1, 6.2
Oct 11	Class 10	6.3, 6.4	Class 11	6.4, 6.5
Oct 18	Class 12	6.5, 6.6	Class 13	7.1, 7.2, 7.3
Oct 25	Class 14	7.3, 7.4	Class 15	7.5, 7.6
Nov 1	Class 16	Review	TEST #2	
Nov 8	Class 18	8.1	Class 19	8.2
Nov 15	Class 20	8.3	Class 21	10.1, 10.2
Nov 22	Class 22	10.3	NO CLASS	NO CLASS
Nov 29	Class 23	10.3, 10.4	Class 24	10.4
Dec 6	Class 25	Review	TEST #3	
Dec 13	EXAM REVIEW		FINAL EXAM	

NO CLASS*

There are 3 Monday vacation days. To keep all sections in sync, there will be no corresponding Thursday lectures.

However, Thursday recitations are NOT cancelled!

Students in the cancelled Monday recitations should meet with the Wednesday or Friday recitation at the same time

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