MAT 397 - CALCULUS III   Summer Session I 2014

Course Description: MAT 397 is the third course in a three-semester sequence in Calculus. This sequence is designed for Mathematics, Science and Engineering majors and for those students in other majors who intend to take advanced courses in mathematics. It covers the concepts of vectors, vector valued functions, functions of several variables, partial derivatives and multiple integration.

Text. *Essential Calculus: Early Transcendentals*, by James Stewart, 2nd edition, Cengage publishing. This is the same text that was used for MAT 295 or 296 at Syracuse University last year. We will cover chapters 10-12 and the first half of chapter 13. The subsections that will not be covered are listed on the homework sheet. Changes to these skipped subsections may be announced by your instructor during the semester.

Background for Course: Completing MAT 296 (Calculus II) with a grade of C- or better is a prerequisite for MAT 397 (Calculus III). **If you have not satisfied this prerequisite, you must drop MAT 397 and register for MAT 296.** Students who earned a C or less in MAT 296 are at great risk in MAT 397. For these students it is important to review material from earlier courses, especially as it comes up again. At the same time it is also vital not to fall behind with the current material.

Calculators: The TI-83+ is the recommended graphics calculator for this course. Students who already own and know how to use another equivalent calculator are free to use it. Calculators may or may not be allowed on exams and quizzes but symbolic calculators (such as the TI-89 or the TI-92) may not be used. On exams and quizzes complete solutions, and not merely answers, must be presented. For example a numerical computation of an integral by calculator is not acceptable.

Course Format: The course meets four times per week. Your instructor will meet with the class for all of these periods. New material will be introduced in lecture by your instructor. Your instructor will answer questions on the course material and the assigned homework problems. Exams will be given in class.

Class Attendance and Participation: You are expected to attend and participate in class. Missing class is the most common reason for poor performance in the course. If you miss a class, you are responsible for obtaining notes for that class from a student who attended. It is also your responsibility to find out about any announcements concerning homework, quizzes or exams that were made during the class.

Homework: Assignments for the entire semester are listed below. Each day's assignment, given in lecture, should be completed before the next class meeting. Variations from the list of homework exercises may be made in lecture. Your instructor may elect to grade some homework assignments and to use these in determining your final grade. It is *essential* to do the homework in a timely fashion! And then do it again.

Help: Your instructor will be available regularly during his office hours. You can also seek help at the Math Clinic in the Reading Room of Carnegie Hall. The Clinic hours are posted by 215 Carnegie Hall or you can obtain a copy of the schedule in the Math Department Office.

Examinations: There will be two examinations during the semester on May 29 and June 12, and then a final exam on the last day of class. **Quizzes** will be given regularly in class.

Final Examination: The final examination will take place on **June 26.** The final will not be given at any other time.

Grades: Each of the midterm examinations counts for 25% of your course grade. The final examination counts for 25%, with the remaining 25% coming from quizzes as well as homework and attendance.

Course Supervisor: Dr. G. C. Verchota, Professor of Mathematics, 229A Physics Building. Hours: M 8-9 am, T 3-5 pm. Telephone 443-1579. Email gverchot@syr.edu.

Class: 12:00 to 2:25 pm, 111 Bowne Hall.

Students with Disabilities: Students who are in need of disability-related academic accommodations must register with the Office of Disability Services (ODS), 804 University Avenue, Room 309, 315-443-4498. Students with authorized disability-related accommodations should 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.

How to Succeed:

(1)   It is absolutely essential that you understand how to solve the assigned problems. Quiz and exam questions will be similar to these problems. It is important to be able to use the skills and techniques presented in the course and not simply to be able to solve a specific set of problems.

(2) Ask questions in lecture, in recitation and at the clinic about anything that is not completely clear. Don't hesitate to bring questions to your instructors during office hours.

(3)   Every day, read and study the sections in the textbook covered in the lecture. Learning mathematics takes time! Read carefully and work through all the examples in complete detail. It can be helpful to try to work through an example on your own before reading the solution.

(4)   Stay caught up. Calculus concepts build on each other cumulatively and you need to stay on top of the material at every stage. If you are having difficulty, don't expect that the problem will take care of itself and disappear later. Contact your course instructor or your recitation instructor immediately and discuss the problem!

(5)   Form a study group. Many students benefit from a study group to work through challenging problems and to review for exams. You should attempt the problems ahead of time by yourself and then work through any difficulties with your study partners. Explaining your reasoning to another student can help to clarify your own understanding.

(6)   You should expect to work hard. Don't get discouraged if you find some of the material very difficult. Be persistent and patient! If you follow the above suggestions, your experience in this course will be a rewarding one.

Homework Sheet

Chapter 10 - Vectors and the geometry of space

Section	Problems	Notes
10.1	online: 3, 4, 10, 13, 27, 31.	
	not-online: 1, 2, 7, 15, 21, 23, 33, 35.	
10.2	online: 5, 7, 9, 11, 13, 15, 17, 18, 24, 28, 34	
	not-online: 2, 3, 4, 10, 12, 18, 21, 22, 33.	
10.3	online: 1, 2, 5, 7, 9, 15, 16, 19, 21, 31, 32, 37, 39	
	not-online: 6, 10, 11, 14, 17, 29, 33, 34, 43.	
10.4	online: 1, 3, 11, 13, 16, 17, 19, 27, 29, 33, 37, 40	
	not-online: 2, 5, 7, 9, 15, 20, 31, 34, 38, 39	
10.5(a)	online: 1, 2, 4, 5, 7, 8, 11, 14, 17, 42, 43	Homework broken into 2 parts. (a)-
	not-online: 3, 9, 10, 13, 15, 18, 19, 44, 46	lines and (b)-planes
10.5(b)	online: 23, 25, 26, 27, 29, 35, 39, 40, 47, 51	
	not-online: 21, 31, 33, 37, 41, 45, 49	
10.6	online: 1, 3, 4, 9, 11, 12-16, 23, 25, 27	
	not-online: 5, 7, 17, 19, 21, 24, 26, 29, 30	
10.7	online: 1, 3, 5, 7, 17, 21, 25, 28, 39-41, 49, 59, 60, 62	Skip using computers to draw space curves
	not-online: 9, 11, 19, 23, 27, 29, 43, 51, 61, 67.	
10.8	online: 1, 2, 3, 39, 41	Skip 4, 40, 42.
	curvature. not-online:	
10.9	online: 1, 8, 10, 13(a), 15, 19, 20, 21, 27 of	Skip tangential and normal components of acceleration and Kepler's laws.
	not-online: 3, 5, 7, 9, 24, 25	

Thursday May 29: Review and 60 minute exam followed by lecture.

Chapter 11 - Partial Derivatives

Section	Problems	Notes
11.1	online: 5, 8, 11, 13, 15, 25, 29, 33, 41-47	
	not-online: 1, 3, 7, 17, 22, 24, 31, 49	
11.2	online: 4, 5, 9, 12, 19, 20, 21, 23	
	not-online: 7, 11, 22, 25	
11.3	online: 3, 5, 6, 8, 9, 14, 23, 25, 32, 39, 43, 45, 55	Skip partial differential equations.
	not-online: 1, 7, 11, 13, 15, 21, 31, 33, 41, 47, 51, 53, 57	
11.4	online: 3, 6, 11, 19, 27, 30	
	not-online: 1, 5, 13, 17, 39	
11.5	online: 1, 4, 7, 9, 11, 17, 32, 33	Skip implicit differentiation
	not-online: 2, 3, 5, 13, 15, 19, 34, 35	
11.6	online: 3, 7, 11, 15, 21, 24, 32, 42	
	not-online: 1, 5, 9, 13, 17, 23, 25, 31, 33, 35, 43	

11.7	online:	7, 11, 25, 28, 34, 37, 43	
	not-online:	1, 2, 5, 9, 13, 23, 35,	
11.8	online:	2, 3, 5, 7, 17, 30	Skip two constraints.
	not-online:	1, 9, 19, 31, 37	

Chapter 12 - Multiple Integrals

Section	Problems		Notes
12.1	online:	1, 7, 8, 12, 15, 17, 24, 29, 35	Skip midpoint rule.
	not-online:	3, 9, 11, 13, 19, 21, 23, 31, 34	
12.2	online:	1, 3, 7, 9, 11, 15, 17, 19, 21, 24, 37, 41, 43.	
	not-online:	5, 13, 23, 27, 39, 45, 49	
12.3	online:	1, 3, 9, 13, 14, 17, 21, 23, 25.	
	not-online:	2, 4, 5, 7, 11, 15, 19, 24, 26,	
12.4	online:	5, 7, 10, 11, 12	Skip moments of inertia.
	not-online: 3, 9, 13, 15		**Thursday June 12:** *Exam,*lecture.
12.5	online:	5, 6, 7, 11, 13, 15, 17, 25, 29, 31, 37	
	not-online:	9, 10, 14, 19, 26, 27, 33, 39	
12.6	online:	3, 5, 8, 11, 17, 20, 23, 27, 29	
	not-online :	1, 2, 4, 6, 7, 9, 13, 15, 19, 21, 30	
12.7	online:	1, 3, 5, 9, 13, 15, 17, 20, 21, 23, 27	
	not-online:	2, 4, 6, 7, 8, 11, 19, 25, 29, 37	
12.8	online:	1, 6, 7, 9, 15, 17, 23	
	not-online:	3, 8, 16, 19, 25	

Chapter 13 - Vector Calculus

Section	Problems		Notes
13.1	online:	1, 5, 7, 13, 15, 25	
	not-online:	11, 12, 14, 16-18	
13.2	online:	1, 3, 5, 7, 9, 17, 19, 21	
	not-online:	6, 11, 13, 15, 18, 22	
13.3	online:	1, 3, 5, 7, 9, 11, 15, 17, 20, 21	Skip conservation of energy
	not-online:	4, 8, 13, 18, 21, 22, 31	
13.4	online:	5, 7, 9, 13, 17	
	not-online:	1, 3, 6, 11, 18	

Final Exam: June 26