Math 397 - Calculus III - Fall 2016

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. This course covers the concepts of vectors, vector valued functions, functions of several variables, partial derivatives, multiple integration, and vector calculus.

Course Supervisor. Professor Loredana Lanzani, Carnegie Room 313G, phone: (315) 443-1475, e-mail: `llanzani@syr.edu`.

Text. *Essential Calculus: Early Transcendentals*, by James Stewart, 2nd edition, Cengage Publishing. 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.

Pre-requisites. Completion of MAT 296 (Calculus II) with a grade of C- or better.

Liberal Arts Core. Completing MAT 397 with a grade of C or better satisfies the Quantitative Skills requirement of the Liberal Arts Core in the College of Arts and Sciences. It also may simultaneously be used to partially satisfy the Natural Sciences and Mathematics divisional requirement.

Calculators and other electronic devices. A calculator may be useful or needed at times for some homework problems. However, **calculators are not allowed on quizzes or exams.** This includes calculators on cell phones. All electronic devices should be silenced and put away during class and exams.

Course Format. The course format is two or three lectures per week (depending on your section), plus a recitation each week. New material will be introduced in lecture by your primary instructor. Your recitation instructor will answer questions on the course material and the assigned homework problems. Exams and quizzes will be given during recitation.

Class Attendance and Participation. You are expected to attend and participate in class. Strong attendance and participation are consistently good indicators of success in this course. On the other hand, missing class is the most common reason for poor performance. If you miss a class, you are responsible for obtaining notes and HW for that class from a classmate who attended. It is also your responsibility to find out about any announcements made in class.

Help. Your instructor and recitation instructor will be holding regular office hours and may 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 and on the departments website.

Course-related problems. Please inform your instructor of any problems you have with this course. Problems not satisfactorily resolved with your instructor should be brought to the attention of the course supervisor (listed above) without delay.

Homework: Homework assignments are listed on the Homework Sheet for the entire semester. Some variations from this list may be announced in class. You may submit some homework assignments to your instructor on paper for grading. Some sections will use the online homework system WebAssign. You may also have weekly quizzes during recitation which are based on the homework assignments.

Midterm Exams. There will be three in-class examinations. There will be **no make-up quizzes or exams**. A missed quiz or examination counts as a zero unless you present a valid excuse from a physician or the Dean's Office. With an acceptable written excuse, your missed exam score will be replaced by your score on that portion of the material on the final.

Final Exam. The final examination covers the entire course. It is a two-hour exam and will be given on **Wednesday, December 14**, 8:00am–2:30pm. The exact time and location of your final examination will be announced at lecture later on in the semester. The final examination is given at this announced time and at no other time. **Do not make plans to leave campus before 2:30 pm on Wednesday, December 14.**

Grades: Each of the three semester examinations counts for 20% of your course grade. The final examination counts for 25%, with the remaining 15% coming from quizzes and homework.

How to Succeed.

1. It is absolutely essential that you understand how to solve the HW 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.

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 303 at 804 University Avenue, or call (315) 443-4498 or TDD: (315) 443-1371 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**.

Religious observances policy. Syracuse Universitys 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 holy days 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 a religious observance provided they **notify their instructors before the end of the second week of classes** for regular session classes and by the submission deadline for flexibly formatted classes. For Fall and Spring semesters, an online notification process is available in MySlice under Student Services/Enrollment/My Religious Observances/Add a Notification, from the first day of class until the end of the second week of classes.

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.

Homework Sheet

Chapter 10 - Vectors and the geometry of space approximately 4 weeks (including one review for Test 1)			
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, 42, 43	Homework broken into 2 parts:
	not-online:	3, 9, 10, 13, 44, 46	(a)-lines and (b)-planes. Skip skew segments.
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	If needed, add refresher problems on basic algebra and basic analytic geometry e.g., how to complete a square; how to solve a quadratic equation (diagnostic tests A and B in textbook)
	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. Skip differentiation properties.
	not-online:	9, 11, 19, 23, 27, 29, 43, 51, 61, 67.	
10.8	online:	1, 2, 3, 39, 41	Skip curvature. If pressed for time, you may skip this entire section (Arc-length is also covered in Chap. 13 and is not used again until that chapter, anyway).
	not-online:	4, 40, 42.	
10.9	online:	1, 8, 10, 13(a), 15, 19, 20, 21, 27	Skip tangential and normal components of acceleration and Kepler's laws.
	not-online:	3, 5, 7, 9, 24, 25	

Chapter 11 - Partial Derivatives			
approximately 4 weeks (including one review for Test 2)			
Section		**Problems**	**Notes**
11.1	online:	5, 8, 11, 13, 15, 25, 29, 33, 41-47	
	not-online:	1, 3, 7, 17, 22, 23, 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			
approximately 3 1/2 weeks (including one review for Test 3)			
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.	If needed, add refresher problems on polar coordinates (Section 9.3).
	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	
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, 28, 37	
12.8	online:	1, 7, 9, 15, 17, 23	
	not-online:	3, 8, 16, 19, 25	

Chapter 13 - Vector Calculus		
approximately 2 1/2 weeks (including two reviews for final exam)		
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	If needed, add refresher problems on curves in parametric equations (Sections 9.1 and 9.2).
	not-online: 6, 11, 13, 15, 18, 22	
13.3	online: 1, 3, 5, 7, 9, 17, 20, 21	Skip conservation of energy
	not-online: 4, 8, 13, 18, 31	
13.4	online: 5, 7, 9, 13, 17	
	not-online: 1, 3, 6, 11, 18	

Final Exam: December 14