

Math 227 - Enhanced Calculus III

4.0 units
Spring 2017
MWF 11:00-11:50am

Location: KAP 138

Instructor: Sami Assaf

Office: KAP 438-C

Office Hrs: M 12pm-1pm, F 10am-11am

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Teaching Assistant: TBD

Office Hours: TBD

Contact: TBD

Course Description

MATH 227 is an honors version of MATH 226/229 and a continuation of MATH 127. It is designed for bright, intellectually curious students who wish to obtain a deeper understanding of some of the mathematical principles behind the formulas and techniques developed in a standard calculus class. In places it will be more rigorous; in other places it will demonstrate connections between calculus and other areas of mathematics such as geometry and algebra. Throughout it will be more interesting, and it will be an excellent preparation for your future studies in any major that would benefit from a strong background in mathematics.

Learning Objectives

This course extends single variable calculus (MATH 125 and 126/7) to a multidimensional setting. Numbers will now be called scalars, and we work with vectors and vector-valued functions as well as curves in 2 and 3 dimensions. We will focus on differentiation and integration of scalar valued functions until we arrive at the multidimensional generalizations of the Fundamental Theorem of Calculus, namely Green's Theorem, the Divergence Theorem, and Stokes's Theorem. Additional enrichment topics will be covered that highlight connections between calculus and aspects of physics and engineering.

Prerequisite(s): MATH 127 or MATH 225

Course Notes

Homework, exam solutions, and lecture notes will be disseminated through Blackboard.

Required Readings and Supplementary Materials

Required: *Essential Calculus*, 2nd edition, by James Stewart.

Description and Assessment of Assignments

Students are expected to complete weekly problem sets that reinforce topics covered in lecture. There will be three in-class midterm exams, on February 1, March 1, and April 5, and a final exam on Wednesday May 3 from 11am to 1pm.

Grading Breakdown

Assignment	% of Grade
Homework	20%
Midterm I	15%
Midterm II	15%
Midterm III	15%
Final Exam	35%
TOTAL	100%

Assignment Submission Policy

Problem sets will be posted on Blackboard by noon on Wednesday and are due in discussion on the following Tuesday.

Additional Policies

This course strictly adheres to deadlines. Late homework will not be accepted without prior permission from the instructor. There are no make-ups allowed for quizzes or exams. If you have a scheduling conflict for a quiz or an exam, you must get prior approval from the instructor at least 2 weeks before the quiz or exam date.

Course Schedule: A Weekly Breakdown

	Topics	Readings	Deliverable (Due Dates)
Week 1	Vectors	10.1-10.4	Homework 1 (1/17)
Week 2	Parametric equations	10.5, 10.7	Homework 2 (1/24)
Week 3	Vector functions	10.7-10.9	Homework 3 (1/31)
Week 4	Review		Midterm I (2/01)
Week 5	Partial derivatives	11.5, 11.7	Homework 4 (2/14)
Week 6	Gradients	11.6, 11.8	Homework 5 (2/21)
Week 7	Double integrals	12.1-12.4	Homework 6 (2/28)
Week 8	Review		Midterm II (3/01)
Week 9	Line integrals	13.1-13.3	Homework 7 (3/10)
Week 10	Green's Theorem	13.4, 13.5	Homework 8 (3/28)
Week 11	Triple integrals	12.5-12.7	Homework 9 (4/04)
Week 12	Review		Midterm III (4/05)
Week 13	Divergence Theorem	13.7, 13.9	Homework 10 (4/18)
Week 14	Stoke's Theorem	13.8	Homework 10 (4/25)
Week 15	Review		
Final			Final Exam (5/03)

Statement on Academic Conduct and Support Systems

Academic Conduct

Plagiarism presenting someone else's ideas as your own, either verbatim or recast in your own words is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in *SCampus* in Section 11, *Behavior Violating University Standards* <https://scampus.usc.edu/1100-behavior-violating-university-standards-and-appropriate-> Other forms of academic dishonesty are equally unacceptable. See additional information in *SCampus* and university policies on scientific misconduct, <http://policy.usc.edu/scientific-misconduct/>.

Discrimination, sexual assault, and harassment are not tolerated by the university. You are encouraged to report any incidents to the *Office of Equity and Diversity* <http://equity.usc.edu/> or to the *Department of Public Safety* <http://capsnet.usc.edu/department/departments-public-safety/online-forms/contact-us>. This is important for the safety of the whole USC community. Another member of the university community such as a friend, classmate, advisor, or faculty member can help initiate the report, or can initiate the report on behalf of another person. The *Center for Women and Men* <http://www.usc.edu/student-affairs/cwm/> provides 24/7 confidential support, and the sexual assault resource center webpage sarc@usc.edu describes reporting options and other resources.

Support Systems

A number of USC's schools provide support for students who need help with scholarly writing. Check with your advisor or program staff to find out more. Students whose primary language is not English should check with the *American Language Institute* <http://dornsife.usc.edu/ali>, which sponsors courses and workshops specifically for international graduate students. The *Office of Disability Services and Programs* http://sait.usc.edu/academic-support/center-programs/dsp/home_index.html provides certification for students with disabilities and helps arrange the relevant accommodations. If an officially declared emergency makes travel to campus infeasible, *USC Emergency Information* <http://emergency.usc.edu/> will provide safety and other updates, including ways in which instruction will be continued by means of blackboard, teleconferencing, and other technology.