



USC University of
Southern California

MATH229

Calculus III for Engineers and Scientists

Units: 4

Fall 2020

MWF: @ 09:00 - 09:50 am

Instructor: Ramtin Sheikhhassani

Office: OHE 500J

Office hours: MW 2:00-5:00 PM. (Online)

E-mail: sheikhha@usc.edu - Include Math229 in subject
I will respond to emails within 48 hours.

Web-page : [Piazza](#)

Teaching Assistant

Alexander Sahakian

E-mail: alexander.sahakian@usc.edu

Discussion TTH.: 8-8:50 AM & 9-9:50 AM

Last edited: Oct/28/2020

Please note that the syllabus is subject to change based on the needs of the class. Changes, if any, will be announced in class. Students will be held responsible for all changes.

Course Description

This course presents concepts of multi-variable calculus to provide an understanding and to develop skill sets required to applications of vector fields, differentiation and integration of multi-variable functions in science and engineering .

Learning Objectives and Outcomes

- Perform basic vector calculations in three dimension
- Visualize and analyze 3D surfaces
- Perform basic operations on multivariate and vector-valued functions including limits, derivatives, integrals, and curvature
- Solve constrained and unconstrained optimization problems
- Apply vector calculus theorems including Green's theorem and the Divergence theorem to simplify integration.

Pre-requisite

Calculus Math 126 or 127 or 129

Textbook

Stewart, J., (2012) *Essential Calculus 2nd* ed. Cengage Learning , ISBN: 9781133710875

Course Notes

Copies of lecture notes, and other class information will be posted on Piazza.

Technological Proficiency and Hardware/Software Required

This course requires use of Blackboard and Piazza.

Communication

I want you to feel comfortable asking questions and giving me feedback on the course. If you have questions or comments, please speak to me directly after class or during my posted office hours. You can also email me (sheikhha@usc.edu). I will respond to all emails within 48 hours.

Description and Assessment of Assignments

Homework

At least 12 problem sets will be assigned. Problems will be posted on Piazza.

Late Work Policy

No late homework will be accepted. Two of the lowest grades in homework assignments will be discarded.

Quizzes

Weekly quizzes conducted in the discussion sessions on Thursdays, with problems extracted from assigned homework or similar problems. There will be a quiz each week with exception of the first week and the midterm weeks. NO “make-up” of any of the quizzes will be offered. Two of the lowest quiz grades will be discarded before a final course grade is calculated.

Examinations

Two midterm examinations are scheduled for the regular lecture periods. The format will be similar to the assigned homework assignments; successful completion of the homework will be a good indicator of your success on the exams.

a. Midterm examinations:

i. Midterm 1: Friday, September 25, class time

ii. Midterm 2: Friday, October 30, class time

b. Final Examination : Wed, November 18, 2-4p.m.

The final examination will be comprehensive, covering all topics presented in the course. Extra emphasis will be placed on the material covered after the second midterm.

A respectable performance on quizzes and exams can be realized by all students if attention and energy are given to the timely completion of assigned homework problems.

Dates

Midterm dates are tentative and may change depending on how the class progresses. Any change will be announced two weeks before. The final examination date and time are set by the office of registration and cannot be changed.

Grading Breakdown

Assignments	Points	%
Homework	100	15
Quiz	100	20
Max(MT#1,#2)	100	22
Min(MT#1,#2)	100	18
Final	100	25
Total	500	100

If there is any extra-credit assignment or project it will be applied to the final exam.

Grading Scale

Course final grades will be determined using the following scale.

Grade	Total
A	93-100
A-	90-92.99
B+	88-89.99
B	83-87.99
B-	80-82.99
C+	78-79.99
C	73-77.99
C-	70-71.99
D+	68-69.99
D	63-67.99
D-	60-62.99
F	59.99 and below

The overall letter grade will be assigned within three days of grading the final. The grade letters are based on a class average performance of B. If the mean falls below the grade cutoffs of B, the grades will be curved.

Grading Dispute

Grading disputes are to be resolved within two days after returning the exam.

Additional Course Policies

Class attendance is strongly encouraged. The approach to specific subjects in the lecture might be different from the text. Students will be responsible for the methods outlined in the class.

Cellphones, laptops, tablets (except for note-taking purposes) and anything else electronic are to be turned off during class.

Final grade will depend entirely on the performance on the above components and be independent of the financial support requirements (e.g., minimum grade requirement for tuition reimbursement).

Work-related travel must be scheduled outside of the mid-term and final examinations periods. Accommodation to take exams on different dates will be made only for family emergencies, religious observance and documented illness or health-related emergencies.

DSP approved students should inform the instructor at the beginning of the semester for any requested accommodation.

Course Evaluation

Two surveys will gather student opinions about the course: the mid-semester evaluation and the standard USC course evaluation survey at the end of the semester. Your opinion is valued and can make a difference in how this course is conducted; please give your honest and constructive recommendations.

Table 1: Tentative Schedule : a weekly breakdown

Lec*	Date	Principal Topics	Readings	Problem Set
1	Mon Aug 17	Three-dimensional coordinate systems,	10.1	
2	Wed Aug 19	Vectors	10.2	
3	Fri Aug 21	The dot products	10.3	
4	Mon Aug 24	The cross products	10.4	
5	Wed Aug 26	Equations of lines and planes	10.5	
6	Fri Aug 28	Equations of lines and planes	10.5	HW1
7	Mon Aug 31	Cylinders and quadric surfaces	10.6	
8	Wed. Sep 2	Vector functions and space curves	10.7	
9	Fri. Sep 4	Arc length and curvature	10.8	HW2
10	Wed. Sep 9	Velocity and acceleration	10.9	
11	Fri. Sep 11	Functions of several variables	11.1	HW3
12	Mon. Sep 14	Partial derivatives	11.3	
13	Wed Sep 16	Tangent planes and linear approximation	11.4	
14	Fri. Sep 18	The chain rule	11.5	HW4
15	Mon Sep 21	Directional derivatives and gradient vector	11.6	
16	Wed. Sep 23	Directional derivatives and gradient vector	11.6	
	Fri. Sep 25	Midterm # 1		HW5
17	Mon. Sep 28	Maximum and minimum values	11.7	
18	Wed. Sep 30	Lagrange multipliers	11.8	
19	Fri. Oct 2	Lagrange multipliers	11.8	HW6
20	Mon Oct 5	Double integrals over rectangles	12.1	
21	Wed. Oct 7	Double integrals over general regions	12.2	
22	Fri Oct 9	Double integrals in polar coordinates	12.3	HW7
23	Mon. Oct 12	Applications of double integrals	12.4	
24	Wed. Oct 14	Vector fields	13.1, 13.5	
25	Fri. Oct 16	Line integrals	13.2	HW8
26	Mon. Oct 19	The fundamental theorem of line integrals	13.3	
27	Wed. Oct 21	Green's theorem	13.4	HW9
28	Fri. Oct 23	Triple integrals in Cartesian coords.	12.5	
29	Mon. Oct 26	Application of triple integrals	12.5	
30	Wed Oct 28	Triple integrals in cylindrical coordinates	12.6	HW10
	Fri. Oct 30	Midterm #2		
31	Mon Nov 2	Triple integrals in spherical coordinates	12.7	
32	Wed Nov 4	Parametric surfaces and their areas	13.6	
33	Fri. Nov 6	Surface integrals	13.7	HW11
34	Mon. Nov 9	Stokes' Theorem	13.8	
35	Wed. Nov 11	The divergence theorem	13.9	
36	Fri. Nov 13	The divergence theorem	13.9	HW12
	Wed. Nov 18	Final Exam 2-4pm		

A review session will be offered for each examination. Dates and time will be announced accordingly.

Table 2: Academic sanctions

Violation	USC – Recommended sanction	Recommended sanction
Copying answers from other students ** on any course work	F for course	First offense: F on assignment Second offense: F for course
One person allowing another to cheat from his/her exam or assignment	F for course for both persons	If assignment: First offense: F on assignment Second offense: F for course If exam: F for course
Possessing or using material during exam (crib sheets, notes, books, etc.) which is not expressly permitted by the instructor.	F for course.	First offense: F on exam. Second offense: F for course.
Continuing to write after exam has ended.	F for course.	F on exam
Taking exam from room and later claiming that the instructor lost it.	F for course and recommendation for further disciplinary action (possible suspension)	F for course
Changing answers after exam has been returned.	F for course and recommendation for further disciplinary action (possible suspension)	F for course
Fraudulent possession of exam prior to administration.	F for course and recommendation for suspension.	F for course
Obtaining a copy of an exam or answer key prior to administration	Suspension or expulsion from the university for both students F for course.	F for course
Having someone else complete course work for oneself.	Suspension or expulsion from the university for both students; F for course.	F for course
Plagiarism — Submitting other’s work as one’s own or giving an improper citation.	F for course.	First offense: F on assignment. Second offense: F for course.
Submission of purchased term papers or papers done by others	F for course and recommendation for further disciplinary action (possible suspension).	F for course
Submission of the same assignment, to more than one instructor where no previous approval has been given	F for both courses.	F for both courses
Unauthorized collaboration on an assignment.	F for the course for both students.	First offense: F on assignment. Second offense: F for course
Falsification of information in admission applications (including supporting documentation).	Revocation of university admission without opportunity to reapply	Revocation of university admission without opportunity to reapply
Documentary falsification (e.g., petitions and supporting materials; medical documentation.)	Suspension or expulsion from the university; F for course when related to a specific course.	Suspension or expulsion from the university; F for course when related to a specific course.
Plagiarism in a graduate thesis or dissertation	Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.***	Expulsion from the university when discovered prior to graduation; revocation of degree when discovered subsequent to graduation.***

*Assuming first offense

**Exam, quiz, tests, assignments or other course work.

***Applies to graduate students

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 Part B, Section 11, “Behavior Violating University Standards” policy. <http://usc.edu/scampus-part-b>

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>.

Support Systems

Student Health Counseling Services - (213) 740-7711 – 24/7 on call

<http://engemannshc.usc.edu/counseling>

Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention.

National Suicide Prevention Lifeline - 1 (800) 273-8255 – 24/7 on call

<http://suicidepreventionlifeline.org>

Free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week.

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 – 24/7 on call

<http://engemannshc.usc.edu/rsvp>

Free and confidential therapy services, workshops, and training for situations related to gender-based harm.

Office of Equity and Diversity (OED) — Title IX - (213) 740-5086

<http://equity.usc.edu>,

<http://titleix.usc.edu>

Information about how to get help or help a survivor of harassment or discrimination, rights of protected classes, reporting options, and additional resources for students, faculty, staff, visitors, and applicants. The university prohibits discrimination or harassment based on the following protected characteristics: race, color, national origin, ancestry, religion, sex, gender, gender identity, gender expression, sexual orientation, age, physical disability, medical condition, mental disability, marital status, pregnancy, veteran status, genetic information, and any other characteristic which may be specified in applicable laws and governmental regulations.

Bias Assessment Response and Support - (213) 740-2421

<http://studentaffairs.usc.edu/bias-assessment-response-support> Avenue to report incidents of bias, hate crimes, and microaggressions for appropriate investigation and response.

The Office of Disability Services and Programs - (213) 740-0776

<http://dsp.usc.edu>

Support and accommodations for students with disabilities. Services include assistance in providing readers/notetakers/interpreters, special accommodations for test taking needs, assistance with architectural barriers, assistive technology, and support for individual needs.

USC Support and Advocacy - (213) 821-4710

<http://studentaffairs.usc.edu/ssa>

Assists students and families in resolving complex personal, financial, and academic issues adversely affecting their success as a student.

Diversity at USC - (213) 740-2101

<http://diversity.usc.edu>

Information on events, programs and training, the Provost's Diversity and Inclusion Council, Diversity Liaisons for each academic school, chronology, participation, and various resources for students.

USC Emergency - UPC: (213) 740-4321, HSC: (323) 442-1000 - 24/7 on call

<http://dps.usc.edu>

<http://emergency.usc.edu>

Emergency assistance and avenue to report a crime. Latest updates regarding safety, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible.

USC Department of Public Safety - UPC: (213) 740-6000, HSC: (323) 442-120 - 24/7 on call

<http://dps.usc.edu>