



Calculus of Several Variables MATH 22 SUMMER 2022

Instructor Info —



Suzana Milea



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Office Hrs: TBA



McHenry 4144

Course Info —



Prerequisite(s): MATH 11B or MATH 19B or MATH 20B or AM 15B or AP calculus BC exam score of 4 or 5.



Mon, Wed & Fri



09:30AM-12:00PM



Remote Instruction (access Zoom through Canvas)
Note. Lecture recordings will be uploaded to Yuja.

Discussion Sections



Sections info will be updated. Attendance is not required, but highly recommended.



TBA



TBA

TA Info —



Xu Gao



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Office Hrs: TBA

Overview

Functions of several variables. Continuity and partial derivatives. The chain rule, gradient and directional derivative. Maxima and minima, including Lagrange multipliers. The double and triple integral and change of variables. Surface area and volumes. Applications from biology, chemistry, earth sciences, engineering, and physics. Students cannot receive credit for this course and MATH 23A.

Textbook

Calculus by James Stewart, 8th Edition, ISBN-13: 978-1285740621,
or
Multivariable Calculus by James Stewart, 8th Edition.

Grading Scheme

20%	Class Participation
30%	Homework
20%	Midterm Exam → Jul 8 (Ch.12&13)
30%	Final Exam → Jul 22 (cumulative)

Grades will follow the standard scale: A: 100% to 94.0%; A-: < 94.0% to 90.0%; B+: < 90.0% to 87.0%; B: < 87.0 % to 84.0%; B-: < 84.0 % to 80.0%; C+: < 80.0 % to 77.0%; C: < 77.0 % to 74.0%; C-: < 74.0 % to 70.0%; D+: < 70.0 % to 67.0%; D: < 67.0 % to 64.0%; D-: < 64.0 % to 61.0%; F: < 61.0 % to 0.0%.

Class Communication

Ed (or 'Ed discussion') is an online threaded discussion platform that supports document and image upload, math equations, embedded video, runnable code snippets, and image annotation. Discussion board posts can be categorized, private, or even anonymous. Student responses can be 'endorsed' and instructor feedback provided. This tool is integrated in Canvas.

Course announcements will be made via Ed Discussion and NOT Canvas. Ed Discussion will be used for all communication and questions outside of lectures and office hours. Contributions to the learning of your peers will be duly noted and may result in a grade bump. If you have a question regarding homework, concepts, logistics, or anything the whole class might benefit from - post it on Ed. If your question is of a sensitive or personal nature, please send me an email. Include "MATH 22" in the subject line.

Exams

Cheating will not be tolerated. There are no make-up exams given. If you miss the midterm exam, your score on the final will count for both the missed midterm and the final. You need to take the final when it is scheduled.

In extreme circumstances, such as in the case of a medical emergency, you can make arrangements before the end of the course in order to receive an Incomplete. The notation I may be assigned, at the discretion of the faculty teaching the course, when your work for a course is of passing quality but for which some specific required work has not been completed.

Homework

You will be able to see the assignments and due dates in Canvas and Gradescope.

Think of the homework as your opportunity to learn the material and expect to spend MANY hours doing homework. The textbook provides answers to odd-numbered exercises. If you look at the answers too soon and too often, you may not learn the material well enough to do well on the tests.

Gradescope

Assignments must be submitted via Gradescope. You don't need an extra account for Gradescope - it is integrated in Canvas. See the instructional video on how to submit an assignment. When you submit your files, you will be prompted to select, for each specified problem, the pages on which the associated work/solution are located. You are required to accurately identify the pages associated to each problem. If you fail to do so, you may lose credit for each problem for which the pages are not correctly identified. It is your responsibility to make sure your submission is legible and easy to read. If you submit work that is difficult or impossible to read, you will not receive credit for it, and you will not be allowed to resubmit.

Late Work Policy

Late submissions of weekly assignments are only accepted, at my sole discretion, in extreme circumstances, such as in the case of a medical emergency. Extreme circumstances must be brought to my attention as soon as possible and before the due date of the assignment.

Accommodations for Students with Disabilities

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At that time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089 or by email at drc@ucsc.edu.

Academic Integrity

The Mathematics Department has a zero tolerance policy towards any incident of academic dishonesty. If cheating occurs, consequences within the context of the course may range from getting zero on a particular assignment, to failing the course. In addition to these sanctions, every case of academic dishonesty is referred to the students' college Provost, who sets in motion an official disciplinary process. Cheating in any part of the course may lead to failing the course and suspension or dismissal from the university.

What is cheating? In short, it is presenting someone else's work as your own. Examples include, but are not limited to, letting someone else do your homework assignment for you, copying another student's midterm or final exam, allowing your own work to be copied, or in any way facilitating the cheating of others. Although you may discuss problems with fellow students, your collaboration must be at the level of ideas only. Legitimate collaboration ends when you "lend", "borrow", or "trade" written solutions to problems, or in any way share in the act of writing your answers.

For the full policy and disciplinary procedures on academic dishonesty, students and instructors should refer to the Academic Integrity page at the Division of Undergraduate Education: <https://ue.ucsc.edu/academic-misconduct.html>.

Title IX

The Title IX Office is committed to fostering a campus climate in which members of our community are protected from all forms of sex discrimination, including sexual harassment, sexual violence, and gender-based harassment and discrimination. Title IX is a neutral office committed to safety, fairness, trauma-informed practices, and due process. Title IX prohibits gender discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking. If you have experienced sexual harassment or sexual violence, you can receive confidential support and advocacy at the Campus Advocacy Resources Education (CARE) Office by calling (831) 502-2273. In addition, Counseling Psychological Services (CAPS) can provide confidential, counseling support, (831) 459-2628. You can also report gender discrimination directly to the University's Title IX Office, (831) 459-2462. Reports to law enforcement can be made to UCPD, (831) 459-2231 ext. 1. For emergencies call 911.

Student Conduct and Community Standards

The UC Santa Cruz community includes students, staff, faculty, and others who have a vested interest in the University. As members of an academic community, integrity, accountability and mutual respect are vital pillars of being part of this community. The Principles of Community further illustrate the values and expectations set forth for being a part of this community. See <https://deanofstudents.ucsc.edu/student-conduct/index.html>.

Tentative Course Outline (06/20/22 - 07/22/22)

TOPIC/READING	TENTATIVE HOMEWORK*
(M) Jun 20 NO CLASS	Juneteenth
(W) Jun 22 12.1: Three-Dimensional Coordinate Systems	p.836: 7,9,11,13,15,17,23,29,31,33.
12.2: Vectors	p.845: 9,11,13,19,21,23,25,27,29,33.
(F) Jun 24 12.3: The Dot Product	p.852: 3,5,7,9,13,15,17,19,39,41,43,49,51,57.
12.4: The Cross Product	p.861: 1,3,5,7,13,15,19,27,29,33,35,37,39,41.
(M) Jun 27 12.5: Equations of Lines and Planes	p.871: 3,5,7,11,19,23,27,31,35,37,45,51,55,69,71,73.
12.6: Cylinders and Quadric Surfaces	p.879: 3,5,7,11,13,15,17,19,21,23,25,27,29,31,33,35.
(W) Jun 29 13.1: Vector Functions and Space Curves	p.893: 3,5,7,9,11,17,21,23,25,29,41,43.
13.2: Derivatives & Integrals of Vector Functions	p.900: 9,11,13,17,19,21,23,25,35,37,39,41.
(F) Jul 1 13.3: Arc Length and Curvature	p.908: 1,3,5,13,17,19,21,23,25,27,47,49.
14.1: Functions of Several Variables	p.940: 15,19,21,23,25,27,29,31,33,35,41,45,53,61,62.
(M) Jul 4 NO CLASS	Independence Day
(W) Jul 6 14.2: Limits and Continuity	p.950: 5,7,9,11,13,15,17,19,21,29,31,33,39,41.
14.3: Partial Derivatives	p.963: 11,15,17,19,21,31,33,41,45,47,49,53,63,67.
(F) Jul 8 Review + MIDTERM	Midterm covers Ch.12 and 13.
(M) Jul 11 14.4: Tangent Planes and Linear Approximations	p.974: 1,3,5,11,15,17,21,25,31.
14.5: The Chain Rule	p.983: 1,3,5,7,9,11,13,17,21,23,27,35,39,45.
(W) Jul 13 14.6: Directional Derivatives & Gradient Vector	p.996: 5,7,9,11,13,15,21,23,25,33,43,45.
14.7: Maximum and Minimum Values	p.1007: 5,7,9,11,13,15,29,31,35,39,43,45,47.
(F) Jul 15 14.8: Lagrange Multipliers	p.1017: 3,5,7,9,11,13,33,35,37.
15.1: Double Integrals over Rectangles	p.1039: 15,17,19,21,23,25,27,29,31,33,35,37,39,43.
(M) Jul 18 15.2: Double Integrals over General Regions	p.1048: 1,3,5,7,9,13,15,17,19,21,23,25,27,51,53.
15.3: Double Integrals in Polar Coordinates	p.1054: 1,3,7,11,15,17,19,25,27,29,31.
(W) Jul 20 15.5 Surface Area	p.1068: 1,3,5,7,9,13.
15.6: Triple Integrals	p.1077: 3,5,7,9,11,15,17,21,27.
(F) Jul 22 FINAL EXAM	The final exam is cumulative.

*Make sure to check the assigned problems and the homework due dates in Gradescope.