Fall 2024 Math 61CM: Modern Mathematics: Continuous Methods

Instructor
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Teaching assistant
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Prerequisites
Score of 5 on the BC-level Advanced Placement Calculus exam, or consent of the instructor

Lectures and TA sessions
MTuWThF 9:30am-10:20am, Hewlett-200

Offfice Hours
M 5:30-6:30pm and W 1:00-3:00pm or by appointment for Eugenia at 382-E
M 1:30-3:30pm and Th 1:30-3:30 for Joseph at 380-R

Textbook and Lecture Notes
The main textbook will be "An Introduction to Multivariable Mathematics" by Leon Simon. The textbook is accessible on the web via the address
https://link.springer.com/book/10.1007/978-3-031-02394-1
if you are on campus. (If you are not on campus, you will need to connect through the Stanford University Library website.)

We will also use notes by Lenya Ryzhik and Jan Vondrak. These notes can be found on Canvas. Some other books which may be useful for the analysis part of the course are:
V. Zorich "Mathematical Analysis I"
W. Rudin "Principle of Mathematical Analysis"
These two books are supplementary and not required. The former book is available electronically through the Stanford website.

As introduction to proof writing and understanding, the following book is recommended:
How to Read and Do Proofs: An Introduction to Mathematical Thought Processes by Daniel Solow (6th edition, ISBN: 1118164024)
There will be a handout on Canvas as well.

Topics of the course
Vector spaces, linear maps and duality, eigenvalues, inner product spaces, spectral theorem, metric spaces, differentiation in Euclidean space, submanifolds of Euclidean space as local graphs, integration on Euclidean space, and many examples.
A lecture-by-lecture list of topics can be found in the schedule, which is posted on the Canvas. Note that there are linear algebra lectures to be held jointly with DM (in the CM classroom).

Homework assignments
There will be nine Problem Sets (homework assignments). Problem set can be found on canvas (at least) one week before it is due. Your solutions are due on Monday at 11:59 pm starting with week 2 of classes (September 30th).
Please, turn in your homework electronically through Gradescope. No late homework will be accepted. Gradescope is set up so that late submission will not be allowed. You may (and are strongly encouraged to) discuss the homework problems with others in the class, but you must write up your own solutions. Also, please, write down the names of people who you have discussed with on your problem sets.
The use of generative AI tool will be treated analogously to assistance from another person. In particular, the use of generative AI is allowed for homework assignments, but you must write up your own solutions and the use of generative AI should be acknowledged. See https://communitystandards.stanford.edu/generative-ai-policy-guidance for more details on Stanford's policy.

Problem sets will be graded for clarity of exposition (write in complete sentences!) as well as correctness. Solutions will be posted, and you are strongly encouraged to review these solutions to learn other ways to look at the problem, etc. **The two lowest homework scores will be dropped.** The final score for the homework assignments will be calculated as the average of seven highest-scoring assignments, each with an equal weight.

Examinations
There will be two midterm examinations (preliminary dates are Monday, October 14th and Tuesday, November 12th, 7-9pm) and a final examination. Dates, times and locations will be announced soon.

Makeup midterm examinations are only available to students with a clash with other classes or in an exceptional situation with prior approval by the instructor. If this applies to you, you should contact the instructor as soon as possible. The final exam is scheduled by the registrar's office and no makeup exams will be available.
All examinations will be in-class, closed books, closed notes, closed internet etc.

Grading policy
The grade will be based on the homework assignments (30%), the midterm exams (20% each) and the final exam (30%).

Access and Accommodations
Stanford is committed to providing equal educational opportunities for disabled students. Disabled students are a valued and essential part of the Stanford community. We welcome you to our class. If you experience disability, please register with the Office of Accessible Education (OAE). Professional staff will evaluate your needs, support appropriate and reasonable accommodations, and prepare an Academic Accommodation Letter for faculty. To get started, or to re-initiate services, please visit http://oae.stanford.edu/.

If you already have an Academic Accommodation Letter, please use the googleform https://goto.stanford.edu/math61cmoae to upload it and detail the specific accommodations you will need in this course. Letters are preferred by the end of week 2, and at least two weeks in advance of any exam, so we may partner with you and OAE to identify any barriers to access and inclusion that might be encountered in your experience of this course. New accommodation letters, or revised letters, are welcome throughout the quarter; please note that there may be constraints in fulfilling last-minute requests.

Switching to 56, 51, etc.
You may switch to (1) MATH 56 or (2) MATH 51, or (3) both MATH 56 and MATH 51 up till 5pm (Stanford time) on Monday of Week 5.
Notice that there are different procedures from usual add/drop if you switch on or after noon (Stanford time) on Thursday of Week 3. Please refer to the separate file *"61-51-transfer.pdf"* for detailed instructions. Watch out for unit change as you switch!

Honor code
Please be sure you are aware of the requirements of the Stanford Honor Code and your responsibilities under the code.

Course related expenses
All students should retain receipts for books and other course-related expenses, as these may be qualified educational expenses for tax purposes. If you are an undergraduate receiving financial aid, you may be eligible for additional financial aid for required books and course materials if these expenses exceed the aid amount in your award letter. For more information, review your award letter or visit the Student Budget website *https://financialaid.stanford.edu/undergrad/budget/index.html*

Syllabus revision
Stanford as an institution is committed to the highest quality education, and as your teaching team, our first priority is to uphold your educational experience. To that end we are committed to following the syllabus as written here, including through short or long-term disruptions, such as public health emergencies, natural disasters, or protests and demonstrations. However, there may be extenuating circumstances that necessitate some changes. Should adjustments be necessary we will communicate clearly and promptly to ensure you understand the expectations and are positioned for successful learning.