Math 118 Introduction to Functions of Several Variables

Summer II 2019—July 1st to August 3rd, 2019

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<tr>
<th>Instructor:</th>
<th>Ning Jia</th>
<th>Office:</th>
<th>TBD</th>
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<tbody>
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<tr>
<td>Class Meetings:</td>
<td>MW 1:00-4:15pm</td>
<td>Location:</td>
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Course Pages: Please check our Canvas page regularly for all announcements, assignments, supplementary materials and schedule.

Office Hours: I will hold regular office hours each week during the following times:

- MW 11:00am-1:00pm (on-campus), F: 9-11am (online)
- By appointment! Send me an email to request a meeting outside of my regular office hours. I’m happy to meet with you privately or with a small group of your peers.

Textbooks:

- Kuttler, A First Course in Linear Algebra (notice you should not purchase this textbook)
- McCallum, et. al., Calculus: Multivariable, Wiley, 7th Edition

Course Description: A combination of linear algebra and differential calculus of several variables. Matrix representation of linear equations, Gauss elimination, vector spaces, independence, basis and dimension, projections, least squares approximation, and orthogonality. Three-dimensional geometry, functions of two and three variables, level curves and surfaces, partial derivatives, maxima and minima, and optimization. Intended for students in the social sciences, especially Economics.

Prerequisites: Math 112 or equivalent. Please seek instructor consent if you have not taken Math 112 at Yale University before.

Brief Course Outline:

- Systems of Linear Equations
- Matrix Arithmetic
- LU Factorization
- Vectors and Algebra in \( \mathbb{R}^n \)
- Functions of Several Variables
- Differentiation of Functions of Several Variables
- Optimization of Functions of Several Variables
Grading Policy:

Pre-Class Assignments ........................................ 15%
Homework ........................................................... 35%
Midterm #1 ......................................................... 25%
Final Exam ........................................................... 30%

Important Dates:

Midterm #1 ....................... July 17th, 4:15-6:15 pm*
Final Exam ....................... July 31st, 4:15-6:15 pm*

Homework: Mathematics is best learned through constant practice. This is especially important during an intense summer course. As such, homework will be collected on every Monday, Wednesday and Friday after the first Monday we meet. You will be able to find the assignments on Canvas under the assignments tab. Homework should be written out by hand, then scanned and uploaded through Canvas to ensure timely grading and feedback. I encourage you to work together and discuss the homework exercises, but each of you should write up and submit your own assignment which is written in your own voice.

Pre-Class Assignments: Prior to each class, you will be asked to complete a reading assignment. Reading guides will be posted to help you pick out the key points and organize any notes you wish to take while reading. In addition to the reading, you will answer a few questions on Canvas, under the quizzes tab, which will help check your understanding of what you read. I will use these responses to tailor the in-class experience to what will be most beneficial to your learning. These pre-class assignments will be due at 9am the day of class, so as to allow me time to review your responses before we meet.

Exams: All exams will be cumulative, with a slight emphasis on the untested material. There will be one midterm exam and a final exam. See above for these dates.

Exam Corrections: For the midterm exam, you will have an opportunity to earn back half of the points that were deducted for errors by providing reflective corrections. That is, you will provide the mathematical corrections along with a narrative explaining why the original solution was incorrect and why the new solution is correct.

Active Learning: In class and online, we will employ a variety of active learning techniques. Designed to keep you all engaged with the material during class, you should be prepared to participate in group work activities, discussions and other tasks. Through these activities, you will be able to ask and get answers to your questions in class.