Math UN1208: Honors Math B
Tuesdays/Thursdays, 1:10 - 2:25, online

Instructor: Evan Warner

Office hours: Mondays 9:00-11:00, Fridays 3:30-4:30 in 512 Math

Email: `warner@math.columbia.edu`

Website: `www.math.columbia.edu/~warner/honorsmathB`

TAs: Adiba Ejaz; see `http://www.math.columbia.edu/general-information/help-rooms/` for office hours.

Course description: This is the second semester of a rigorous, accelerated introductory course in calculus and linear algebra. The course material will be theoretical rather than applied, and it is expected that students will develop facility in reading, understanding, devising, and writing proofs. Our study of linear algebra will cover linear independence, rank, determinants, orthogonality, and eigenvectors, culminating in the spectral theorem. We then turn to vector calculus, aiming for the famous theorems of Green, Gauss, and Stokes.
As in the previous semester of this class, you should expect to work considerably harder in this class than in a normal calculus class; this is reflected in the fact that each semester of Honors Math counts for 4 credits instead of 3, and students who complete the courses need not take Linear Algebra (Mathematics V2010). The prerequisite is the first semester of this course (Math UN1207) or the instructor's permission.

Class sessions: All classes will be conducted on Zoom and can be accessed via Courseworks. Class sessions are saved and I understand that some students may have time zone issues, so attendance at the scheduled time is *not* required. However if you can reasonably attend, you should – it affords the opportunity to ask questions during the flow of lecture, and I will also occasionally use the quiz feature on Zoom for feedback purposes (not graded). If you opt to watch the lectures later, be careful not to fall behind; it is best to schedule your own time in advance so that you can watch the lectures within a day or so of the class time.
Students in attendance at the scheduled time do not have to turn their videos on during lectures, although you are welcome to if you like; presumably there is some social benefit. I will try to be proactive and explicitly solicit questions often, but also please feel free to interrupt if you are confused about something, or use the chat function for that purpose. Questions during lecture are usually helpful not only to the questioner, but also to the rest of the class.

Textbook: Tom M. Apostol, *Calculus*, 2nd edition, Volume II (Wiley). Reading and written assignments will be drawn from this text. Note that the last two chapters of Volume I are repeated in Volume II. We will cover, approximately, Ch. 1-5, 8, and 10-12.

Homework: Homework will be assigned weekly and will be due at 1:00 p.m. each Tuesday, starting the second week. Assignments will be posted on the course webpage and are to be submitted electronically on Courseworks. You may type or handwrite your solutions; handwritten

solutions may be scanned or photographed but should be legible and contained in one pdf file. Please check to make sure that your file has uploaded correctly; if there are problems you may email the file to me directly.

No late homework will be accepted without prior approval; however, to take care of the occasional lapse *the lowest homework score for each person will not count towards their final grade.* I recommend you not use this "free pass" too early in the semester! You should attempt every homework problem and are responsible for understanding how to solve them for the purpose of exams. Collaboration and discussion with your classmates is encouraged, but each assignment must be written individually, in your own words. In particular, do not exchange any written work with others and do not use any sources for a given problem that trivialize that problem.

In addition to the problems that you are to hand in, there will be some supplementary problems. You are expected to try these and (eventually) understand how to solve them as well, but they will not be graded. They might make good exam practice problems. Finally, each assignment will also include some reading from the textbook (up to 40 to 50 pages, perhaps more on occasion). Much of this will duplicate what is in the lectures, but not all, and you are responsible for understanding the content of both.

Exams: Assessments in this class will be modified slightly from previous semesters. There will be two online, timed multiple-choice "quizzes" that will take the place of the midterm, as well as a take-home final exam. The "quizzes" will be scheduled for Thursday, February 11 and Thursday, March 18 during the first part of class (starting at 1:10 pm). If, due to time zone issues or otherwise, you cannot take the quiz at this time, let me know at least two weeks in advance and an alternate sitting will be scheduled. The final exam will be due at the end of exam period, 5:00 pm on April 23rd. It will be available starting at least a week in advance of that date. Grades will be based 40% on homework, 10% for each quiz, and 40% on the final.

Extra help: If you are unable to make the office hours, feel free to email me to schedule an appointment. Additionally the Columbia Help Room (406 Math) is available without appointment when it is open.

Disability accommodations: If you have an exam accommodation through Disability Services, please let me know at least two weeks in advance so that the (virtual) paperwork can be completed with enough time in advance to make the necessary arrangements.

Academic dishonesty: Anyone found to have cheated on an exam will receive a failing grade for the course and be subject to administrative discipline. Cheating on assignments (e.g., copying written work from somebody else) will also normally trigger administrative disciplinary procedures. Fortunately, the vast majority of students do not cheat in classes like this. Please come to me (or use another resource) if you are struggling with the material instead of resorting to cheating.