PRELIMINARY SYLLABUS FOR UN2000 INTRO TO HIGHER MATHEMATICS - SPRING 2023

FRANCESCO LIN

General information

Contacts. You can contact me at fl2550@columbia.edu. My office is 613 in the Mathematics building.

Time and location. TTh 1:10-2:25PM, room TBA.

Prerequisites. There are no formal prerequisites beyond high-school algebra and some exposure to calculus/limits (Calculus I is more than enough).

Teaching assistant. TBA.

Office hours: TTh 12:30-1PM and 2:30-3PM in my office.

Course Web Page. All materials of the class will be available on Coursework.

Textbook. The main textbook, which we will follow quite closely, is *Transition to Higher Mathematics* by Dumas and McCarthy. Another very useful resource, with many worked examples, is *Reading, writing and proving* by Daepp and Gorkin.

Course Content. This course gives a fairly leisurely introduction to the basic concepts of analysis, topology and algebra. We will explore the fundamental definitions and proofs in these subjects, illustrating them by many explicit examples. A central theme of the class is the mathematical concept of infinity (in its various forms).

The course is intended for students who are interested in mathematics and mathematical reasoning, but who have not had much experience in dealing with abstract definitions and proofs. The main aim is for students to learn how to read and understand the language of abstract mathematics, and to construct and write down valid proofs. The ability to do this is an invaluable aid in understanding more advanced math classes, such as Analysis and Optimization, and the Modern Analysis and Algebra sequences.

Materials. The (handwritten) notes I use for the lectures will be posted on Courseworks.

Assessment

Homework: There will be (around eleven) weekly assignments. Their contents and deadlines are in the Assignments on the course web page. They will be due on Thursdays at 11PM via a file upload.

If you plan on turning in handwritten solutions, make sure to upload a **single, readable PDF** (scanning apps such as CamScanner are strongly recommended); documents that do not satisfy this requirement will **not** be taken into consideration. Your solutions should be clearly marked with problem numbers, and they should appear in the same order as the book. Your name (first and last) needs to be written clearly and legibly at the beginning of each set. Write your explanations clearly, and circle or box the final answers where appropriate. The graders will be instructed to take away points for anything that causes them undue difficulty in grading your homework, including poor presentation, organization, or handwriting. You may check your calculations using a calculator or any other technology while doing homework, but you must include all steps of a calculation (done by hand) to receive full credit.

The course policy is that **homework delays are not accepted**. However, your two lowest homework scores will not count towards your grade. Use these for unexpected circumstances such as illnesses when you are unable to do or hand in your assignment on time. Do the problems later, on your own, so that you learn the material.

Homework is the best way to stay up to date with the material. We **encourage** you to collaborate with your classmates, **but** to hand in your own copy of the assignment. Identical copies are a violation of the expected standard of academic integrity and will be dealt with according to university policy.

Exams. There will be two 75 minutes in-class **midterms** on February 14th and March 28th respectively. The **final exam** date TBA is scheduled by the Registrar, and it will cover the entire course.

There will not be make-up exams. You must plan to take the midterm and final exams at the scheduled time. Besides students with disabilities having prior arrangements with ODS, the only exceptions will be for those with an incapacitating illness, a serious family emergency, or situations of comparable gravity. In both cases you will need a note from your advising dean. Incompletes can be granted only by your advising dean and only in the circumstances mentioned above.

Books, notes, calculators, and other electronic devices will not be allowed (or needed) on quizzes or exams. Anyone guilty of academic dishonesty, such as cheating on an exam or helping someone else to cheat, will automatically fail the course and faces further academic discipline.

Students with disabilities. In order to receive disability-related academic accommodations for this course, students must first be registered with their school Disability Services (DS) office.

Exam preparation. I will provide a practice test about one week before the actual exams; these will be close in spirit to the actual test, and it is recommended for you to work on them on your own in a test-like setup.

Review Sessions. There will be in-class review problem sessions on February 9th, March 23rd and April 20th in preparation of the tests.

Grading. Your final score will be computed via the following weights:

- Homework: 25%
- Each midterm: 20%
- Final: 35%

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