

MATH-UA 328: Honors Analysis

Spring 2021

Version: 01/18/2021

- **Instructor:** Dr. Tanzi Matteo

- e-mail: matteo.tanzi@nyu.edu. Please include “[Analysis]” in the subject line of any correspondence.
- Office: Warren Weaver Hall 519.
- Office hours: via Zoom 11:30AM-1:30PM Wed or by appointment.

- **Teaching assistant**

- Eric Thoma

- **Course information**

- Lecture time and location: Monday & Wednesday 9:30–10:45 AM via Zoom.
- Recitation time and location: Friday 9:30–10:45 AM. There is no recitation during the first week.
- Course website: all the material and announcements will be posted on NYU Classes.
- Textbook:, Johnsonbaugh and Pfaffenberger, *Foundations of Mathematical Analysis*.
- Additional materials: a classical reference for real analysis is Walter Rudin, *Principles of mathematical analysis*. This book contains many good exercises, and a nice point of view on some topics and is a valuable additional resource.
- Prerequisites: See <https://math.nyu.edu/dynamic/courses/undergrad/math-ua-328/>

- **Course outline**

We will rigorously study some fundamental concepts of analysis, mainly concerning functions in one real variable:

- sequences and series;
- continuous functions;
- differentiable functions;
- Riemann integration;
- metric spaces.

You have already encountered most of the above in your Calculus curriculum, however, we are not going to focus on the computational aspects (finding limits, computing derivatives, sketching graphs, etc.), but rather on the rigorous mathematical definitions and properties of these objects (rigorous definition of a limit, mathematical properties of continuous functions, etc.). We will cover most of the material in between chapters I and IX of the book.

- **Learning Objectives**

Throughout the course you will learn

- the main definitions of the mathematical objects listed above, and the related lemmas, propositions, and theorems that describe their properties;
- to use definitions, lemmas, propositions, and theorems to prove claims concerning the mathematical objects under study;
- given the definition of a mathematical object not encountered before, to prove claims concerning that object;
- **to write a concise and logically sound proof of a given claim.**

- **Grade breakdown and test dates**

- Homework 20%. Assignments will be posted on NYU Classes usually on a Monday, and will be due by the beginning of class on the following Monday. Please write clearly, and staple together all your sheets of paper.
- Midterm Test 35%. The date will be communicated later (you should expect the midterm to be in the second half of March).
- Final Exam 45%. The date of the final examination will be communicated later.
- No extra credit projects will be offered.

- **Homework and examination policy**

- Late homework will not be accepted for credit, and no extensions will be given.
- The lowest written homework score will be dropped.
- In case of documented prolonged illness, documented affliction or observance of religious holidays you will be excused from handing in the assignment, and the corresponding grade will be transferred to the midterm if the assignment is due before the midterm, or to the final exam if the assignment is due after the midterm.
- You are allowed to discuss homework with fellow students, but you should write your answers in your own words.
- In case you would like your homework assignments to be remarked because you think that the grader committed a mistake, you should send me an e-mail specifying **which questions** you would like to have remarked and why you think they should be remarked.
- Out-of-sequence examinations may be approved in the following cases:
 - * Documented medical excuse
 - * University-sanctioned event such as an athletic tournament or a performance. Athletic practices and rehearsals do not qualify. Please request a supervisor or faculty advisor to contact the lecturer.
 - * Religious holiday
 - * Extreme hardship such as a family emergency

Please contact me at least a week in advance to schedule them.

- If you miss an examination due to an emergency, please provide written documentation within 2 days of the missed examination.

- **Academic integrity**

- You are expected to follow codes of academic integrity as specified by the university and the College of Arts and Sciences:

- * <https://www.nyu.edu/about/policies-guidelines-compliance/policies-and-guidelines/academic-integrity-for-students-at-nyu.html>
- * <https://cas.nyu.edu/content/nyu-as/cas/academic-integrity.html>
- * <http://cas.nyu.edu/content/nyu-as/cas/academic-integrity/honor-code.html>