Syllabus: Introduction to Analysis

CAS MA 511

Summer 1, 2021

Instructors: Greyson Potter and Robert Jencks

Lecture: 3:00-5:00 PM on Monday, Tuesday, Wednesday, Thursday in CAS 315 (and via Zoom)

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Office Hours: Unless otherwise announced, office hours will be held via Zoom as follows:

Monday	12:00-2:00PM and 8:00-9:00 PM
Tuesday	1:00-2:00 PM
Wednesday	8:00-9:00 PM
Thursday	1:00-2:00 PM
Friday	3:00-5:00 PM

Prerequisites: Multivariate Calculus (CAS MA 225 or CAS MA 230)

Textbook: *Understanding Analysis*, Abbott, Second Edition, Springer (ISBN: 978-1-4939-2712-8)

Description: Introduction to Analysis is a proof-based course in which we carefully study the underpinnings of calculus. The topics include properties of the real-number system, sequences and series, elementary topology, limits, convergence and uniform convergence, continuity, differentiation and integration. Students will be expected to learn how to both read and write detailed, rigorous mathematical proofs.

Format: Course information will be posted on Blackboard. Lectures will be recorded and made available for students who are not able to attend synchronously in person or via Zoom. Office hours will take place only via Zoom. Homework and exams will be turned in on Gradescope. If you are not familiar with any of these platforms, do not worry. All of the links and information about them will be posted on Blackboard.

LfA Status: Due to COVID-19, BU is still in a Learn from Anywhere modality for this summer. As such, it is important that you have your LfA status up to date and remain in compliance with the school's COVID-19 regulations. Your LfA status can be updated through the Student Link. Based on your status, you may need to complete daily symptom attestations and take regular COVID tests. Additionally, you will need to specify whether or not you will attend class in person or remotely via the InClassLfA app. If you intend to be in class, please submit that request at least 24 hours before hand so that the system can determine if there is enough space. If you are not attending in person or are not sure, please choose those options so that there are as many seats available as possible.

Important Dates: Take note of the following dates:

- May 24: First day of class
- May 28: Last day to drop without a 'W' grade (as well as last day to get a refund).
- May 31: Memorial Day holiday.
- June 4: Substitute Monday schedule.
- June 4: Last day to drop with a 'W' grade.
- July 1: Last day of class.

Content: We will cover most of chapters 1-7 of the textbook, namely:

1. The Real Numbers
2. Sequences and Series
3. Basic Topology of $\mathbb{R}$
4. Functional Limits and Continuity
5. The Derivative
6. Sequences and Series of Functions
7. The Riemann Integral

Homework: Writing proofs and working out examples are essential to learning analysis. Since the homework accounts for more than half of the grading, you will be expected to spend a significant amount of time on it. Suggested problems will be assigned every class and some subset of them will be collected weekly. The numbering for the assigned problems will come from the second edition. Since the class moves quickly, late homework will not be accepted. You are encouraged to discuss the homework problems with each other, but your write-up must be your own. Any plagiarizing will result in a referral to the academic conduct committee for disciplinary action.

Final Exam: There will be a single take-home exam, which will start after the final class. There will be no makeups and absences are only excused under exceptional circumstances. In such special cases, you must obtain an excused absence *prior* to the exam.

Grading: The grading breakdown will be as follows:

Homework	75%
Final Exam	25%

Academic Conduct: Your work and conduct in this course are governed by the CAS Academic Conduct Code. This code is designed to promote high standards of academic honesty and integrity as well as fairness. It is your responsibility to know and follow the provisions of the code. In particular, all work that you submit in this course must be your original work. Any cases of suspected academic misconduct will be referred to the CAS Student Academic Conduct Committee.