Math 104   VAINTROB

Syllabus, Spring 2019

Basics

INSTRUCTOR. Dmitry Vaintrob,

INSTRUCTOR'S EMAIL. vaintrob@math.berkeley.edu. Please use email or come to my office during office hours to get in touch with me.

INSTRUCTOR'S OFFICE. 1073 Evans Hall

CLASS LOCATION. 3107 Etcheverry

CLASS TIME. Tuesdays and Thursdays, 3:30-5:00 PM.

OFFICE HOURS. Tuesday, 9:00-10:00 AM and Thursday, 10:00 AM-12:00 PM (first hour shared with my math 113 OH), in 1073 Evans Hall.

GSI. TBD (shared with all other 104 classes)

TEXTBOOK. *Elementary Analysis: The Theory of Calculus*, by Ross, **second edition**. ISBN:9780201763904.

COURSE WEBSITE. `https://math.berkeley.edu/~vaintrob/analysis`.

Content

OVERVIEW. This is a course on analysis with theorems and proofs. Some familiarity with proof-based mathematics will be expected.

COURSE TOPICS. The real number system. Sequences, limits, and continuous functions in R and R. The concept of a metric space. Uniform convergence, interchange of limit operations. Infinite series. Mean value theorem and applications. The Riemann integral.

Exam dates

Midterm #1 will be on Tuesday, **February 26**, during regular class time.

Midterm #2 will be on Tuesdsay, **April 9**, during regular class time.

The Final exam will be on Friday, **May 17**, 7:00 PM - 10:00 PM.

Exam dates are not subject to change and there will be no makeup exams given (except in cases of documented medical or family emergency). If you foresee a conflict with one of these dates, keep in mind that there are several different sections of math 104 this semester, each with its own exam dates. If one of these dates does not work and you are unable to change sections because of space constraints, please let the GSI or myself know about your situation and we will try to work something out.

Grading

30%: Homeworks and reading assignments. Lowest homework score dropped.

30%: Final exam.

20%: Midterm I (see note below).

20%: Midterm II (see note below).

Note. If it benefits your score, the lowest midterm grade will be replaced by your grade on the final exam.

Homework: due dates and submission

- Homeworks will be assigned each Tuesday, and put on the course webpage. They will be due by Tuesday of the following week, at the beginning of class.

- Submissions after 5pm will be considered late. Illegible homeworks or homeworks without a legible name may not be graded. Printed homeworks typeset using LaTeX (or a comparable math typesetting program) are encouraged.

- Late homeworks will be accepted in class two days after the due date (i.e., Thursday), but will be penalized 10% of the total score. Students with DSP accomodations can get the penalty waived. Any later homework submissions will not be accepted (including for DSP accomodated students).

- If you would like to request an extension because of special circumstances, please email me at least two days before the original due date. If you don't have a valid reason or do not notify me early enough, you will not be able to get an extension (with the exception of medical emergencies).

- Many homework problems will require rigorous proofs. Proofs must be logically correct and concise within reason (extremely long or very badly written proofs may lose points even if correct).

- Collaboration is encouraged, but everyone must write up their own solutions. Please list collaborators and anyone else who helped at the beginning of your homework assignment. Listing collaborators will not affect anybody's grade, and is requested for convenience of the grader and myself.

Book readings

The class textbook covers the material in concise, readable chapters. There will be required reading for each class (not more than 10-15 pages: note however that reading math is much more dense than most other subjects!) For each class I will post some reading-related exercises which you are required to do but *do not need to turn in* with the rest of the homework. You are encouraged to keep these in a separate hand-written document, together with any other notes you take while reading, and bring them to class every day. At a few random points in

the semester I will collect these in class and having complete, original and up-to-date write-ups will be worth up to 10% of your total grade (up to 1/3 of the homework component). Please note that if you are absent or leave your notes at home when this happens you will incur a late grade.[1]

You are encouraged to scan these regularly or keep them in a safe place, as you would have to re-create the entire document if it is lost.

Exams

- The two midterms will be roughly at 1/3 and 2/3 of the semester. The final will cover the entire semester's worth of material, with a focus on the last third. Exams are closed book, without notes, calculators or other external aids.

Attendance

- Please be respectful of yourselves and others: refrain from talking or checking cell phones during class.

- Lectures will not follow the course book exactly: some material will be presented differently and we may diverge from the book at some points. Anything done in class can be on a homework set or test, unless stated otherwise. If you have to miss class for some reason, it will be your responsiblity to get notes from someone else.

Miscellaneous Information

- If you will need special accommodations approved by the Disabled Students Program, make sure you discuss these with me as soon as possible.

- Incomplete "I" grades are almost never given. The only justification is a documented serious medical problem or genuine personal/family emergency. Falling behind in this course or problems with workload in other courses are not acceptable reasons.

- Academic dishonesty will not be tolerated. Any such incidents will be reported to the appropriate authorities and will almost certainly result in you failing the course.

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[1]You may also keep these in a LaTeXed, digital format as a pdf. In that case, you would have to email them to me within two hours of the end of class for a full score.