Math 331 Introduction to Real Analysis
Fall 2021 Syllabus

Lecture: MWF 12:20–1:20 HIG 110

Instructor: Pierre-Olivier Parise (email: `parisepo@hawaii.edu`)
Office: Physical Science Building (PSB) 305
Office hours: TBD

Course description

This course is intended to introduce the student to the fundamentals of real analysis. The content to be covered includes axioms of real numbers, sequences, limits of functions, continuity, differentiation, the Riemann integral, as well as infinite series and sequences/series of functions (if time permits).

WI course: This course is part of the five(5) WI courses you will take in the program. This means that you will be evaluated on your proviciency of writing correct mathematical proofs. Some questions of midterms, homework and team tests will receive feedback from me and you will be allowed to rewrite the proof correctly in your semester project. Overall, during the semester, you will be inspected to write about 4,000 words (which is equivalently about 16 pages). The semester project is estimated to be 4 pages long.

Prerequisites: A grade of C or better in Math 140 or Math 215 or precalculus assessment as specified by the department.

Lectures

There will be lectures each Mondays, Wednesdays, and Fridays, 12:20–1:20pm taking place at HIG 110. All students are expected to attend and participate in each lecture and take their own personal notes. Some material may be presented during lectures that is not in the book.

A student who misses a lecture is responsible for any assignments and/or announcements made. Unavoidable absences should be explained to the instructor. Office hours will not be utilized to re-teach material presented in a class missed by a student.

Course material

Textbook: Edward D. Gaughan, *Introduction to Analysis*, 5th Ed. Access to the textbook is required, as some homework questions will be assigned out of it.

Lecture notes: Attend lectures regularly and take your own notes.

Course website: `https://mathopo.ca/courses-website/math-331/math-331`

Grading components

The students will be required to scan and upload their solutions to the homework and team tests on Gradescope (`http://gradescope.com`, entry code GEK6Y4).

Evaluation	Number	% average
Midterms	3	30%
Final	1	20%
Homework	7	20%
Team Tests	3	10%
S. Project	1	20%
Total	15	100%

(1) **Midterm exams:** There will be two(2) closed book and closed notes midterms exams. Each exam will have a duration of 50min and will be done during class (in-person). No extra time will be allowed. Midterms are not cummulative. This will be at least one question to test your mathematical proof writing. You will get detailed feedback on these questions. Then you may add your corrected version of the proof to your semester project. This component counts for 30% of the course average (at least 10% will count for writing correct mathematical proofs).

(2) **Final exam:** There will be one closed book and closed notes final exam as scheduled on the 13, December 2021 12–2pm. This exam is cummulative and will be in-person. It is not possible to do the exam earlier. This part will count for 25% of the course average.

(3) **Team tests:** There will be three(3) team tests in-person. You will work in team of two(2) on a set of problems (usually 2 problems and there will be a problem x focusing on your mathematical proof-writing). The duration of the test will be 30 minutes. For the remaining 20 minutes, I will give the answers to the questions on the board and you will have to take you personal notes. Your corrected copy will be uploaded on gradescope. Based on my feedback, you may rewrite your proof of problem x and add it to your semester project. This part will count for 15% of the course average (at least 5% for evaluating skills to write correct mathematical proofs).

(4) **Homework:** There will be homework each two weeks. There will be assigned on Mondays (starting on 30, September 2021) and due on the next mondays at 1:20pm. The assigments will be posted on the course website each Mondays morning. You should have access to the book because the exercices will be extracted from it. This part will count for 20% of the course average (at least 5% for evaluating skills to write correct mathematical proofs).

(5) **Semester project:** There will be a semester project. This project will be an opportunity to write-up correct proofs of the problems you've missed during the Midterms and team tests. Even if your proof is correct, I will provide feedback to enhance the clarity of the exposition. I highly recommand LaTeX to write your semester project. Here are some references that may help you:
- A LaTeX tutorial: `http://math.hawaii.edu/wordpress/latex/`
- I recommand to use TeXMaker to produce your source file.
- There is also an internet based options: `https://www.overleaf.com/`
- I will also provide a .tex template that you can use

For the structure of your project, you must provide the statement of the questions and the correct proof directly after (see the template offered on the course website). This project is espected to be a 4-pages document. **You must follow the**

following template to name your file: LASTNAME_FIRSTNAME.tex. If you don't respect this template, you will loose five(5) points and you will ask to resend your file on gradescope. This part will count for 20% of the overall average.

An overall of 40% (5% + 5% + 20%) is dedicated to evaluate your skills at writing correct mathematical proofs.

Missed assignment policies

Policies for exams: Attendance on the exams is compulsory; otherwise, a grade of zero will be recorded. Any student who has an excused, documented conflict with a test time must inform their instructor **within the first two weeks of the semester** when possible. Late requests will either be denied or will result in an automatic deduction from the exam score.

For those students with an excused absence for a midterm, there will be a make-up exam which must be taken within two working days of the scheduled exam time (before or after). Conflicts arising from work or social obligations, or from personal travel plans do **not** qualify as excused absences. By registering for this course, you are agreeing to take all exams at the scheduled times.

Policies for homework: No late homework accepted. A note of zero(0) will be assigned for late homework.

Academic integrity: All students are expected to abide by the university's Conduct Code. Academic sanctions for dishonesty may include receiving an F in the assignment or receiving an F in the class. There may be additional administrative sanctions.
`https://www.hawaii.edu/policy/index.php?action=home&policySection=ep`

Classroom policies

Please refrain from using electronic items, including calculators, cell phones, music players, tablets, laptops, etc., during class, except for note-taking. Please arrive, be seated and ready to start each class on time. If you have a valid reason to leave early, please sit near the exit to minimize disruption.

Sources of help

All students are encouraged to come to *office hours* to discuss homework questions or material from class. If the advertised times do not suit you, please email me to set an appointment. It will be my pleasure to accomodate you.

KOKUA: I am happy to work with you and the KOKUA Program (Office for Students with Disabilities), if you need course accommodations due to a disability. KOKUA can be reached at (808) 956-7511 or (808) 956-7612 (voice/text) in room 013 of the Queen Lili'uokalani Center for Student Services. All course modifications must be arranged through KOKUA. You are encouraged to start this process as early as possible.

Concerns

If at any time during the semester you have any questions or concerns about the class, please contact me during regularly scheduled office hours or via email to make an appointment. You may also contact the following people:

Director of Undergraduate Studies
Mirjana Jovovic
Email: undergrad-dir@math.hawaii.edu

Associate Chair
Bjørn Kjos-Hanssen
Email: assoc-chair@math.hawaii.edu