

Syllabus Spring 2024

MATH 3468, Analysis of Several Real Variables, 3 Credit Hours

Meeting Time, Meeting Pattern, Location

Tuesday & Thursday: 2:50-4:05

Cohen Hall 208

Instructor Name, Contact Information, Office Hours

Instructor: Assistant Professor Spencer Backman

Email: sbackman@uvm.edu

Office: Innovation Hall E441

Office Hours: Tuesday 4:30-5:30 and Wednesday (sometime TBD). I will update this on the syllabus on Brightspace when I make a decision about Wednesday.

Midterm dates: Thursday February 29th and Thursday April 11th

Final Exam date and location: May 7th from 4:30-7:15 in our classroom COHEN 208

Technical support for students

Students, please read this technology checklist to make sure you are ready for classes.

<https://www.uvm.edu/it/kb/student-technology-resources/>

Students should contact the Helpline (802-656-2604) for support with technical issues.

Pre-requisites or co-requisites

Prerequisites: [MATH 2468](#) or [MATH 2551](#) or C- or better in [MATH 2055](#); [MATH 2248](#); [MATH 2522](#) or [MATH 2544](#).

Notes on courses or transferred-in AP exam scores that may duplicate credit (if applicable) *(Note: It is important to ensure that this information is updated yearly.)*

Catamount Core/General Education (e.g., AH1; D1) or other requirements satisfied (if applicable). Please include corresponding [outcomes information](#).

Quantitative Reasoning QR

Course Description

Real analysis is the study of the real numbers, particularly as it relates to concepts of continuity, differentiability, and integrability of functions. This course will cover properties of the real numbers, basic topology of metric spaces, infinite sequences and series, and continuity. A first sequence in real analysis is often described as “calculus with proofs”, but it is more than this; for proving things in this setting, we will need to develop new conceptual tools.

Course Learning Objectives/Outcomes

The goal of this course is to learn about the real numbers and the underpinnings of calculus while simultaneously strengthening your understanding and command of logical reasoning and proof-based mathematics.

I want everyone in this class to succeed. This course may be very challenging for you, and this is natural, but if you find that you are really struggling, e.g. regularly spending more than 6 hours per week outside of class, please get in touch with me. Additionally, I strongly encourage you to make use of office hours. This can be a very good time to get additional help with the material.

Required Course Materials:

Mathematical Analysis, 2nd Edition, by Tom Apostol.

Required platforms and software:

Brightspace and maybe Teams.

I am not planning to use Respondus Monitor or Lockdown Browser, but I am including the statement below in the unexpected situation that the course goes remote part way through the semester.

Note that there are limitations for which systems can use Respondus Lockdown Browser.
[Please review the instructor information](#) before choosing to use the Lockdown Browser in your

class. **If using Respondus Monitor for proctoring tests, be sure to include the following information:**

This course will use **Respondus Monitor**, automated exam-proctoring software that uses artificial intelligence to flag suspected cases of academic integrity violations during exams. The software will make a video/audio recording of you taking your exam, but a proctor is not watching you take the exam.

After the video recording of you taking your test is processed, faculty are notified if there are points in your video where academic dishonesty may have occurred. The faculty member then reviews only these flagged video segments. Monitor has been reviewed by UVM's information security team and meets the institution's requirements for data security and privacy.

Important information for students to include if you will be using Respondus:

[This page explains technical requirements and step-by-step instructions for students to set up and take tests with Respondus](#)

Brightspace, MS Teams, or other course sites:

I will use Brightspace for entering grades. I may use Teams for posting supplementary materials. I will primarily communicate by email. You can always communicate with me before or after class and in office hour.

For Brightspace information, students can access the following UVM Knowledge Base article:

<https://www.uvm.edu/it/kb/article/brightspace-for-students/>

Attendance Policy and Classroom Environment Expectations:

You should attend class and be respectful of me and your fellow students, e.g. please do not speak over me or others, text, or leave your cell phone on.

“In this class, we will work together to develop a learning community that is inclusive and respectful. As a learning community we will seek to encourage and appreciate expressions of different ideas, opinions, and beliefs in the spirit of Our Common Ground. Meaningful and constructive dialogue is encouraged in this class. This requires mutual respect, willingness to listen, and open-mindedness to opposing points of view. Respect for individual differences and

alternative viewpoints will be maintained at all times in this class. Conduct that substantially or repeatedly disrupts the ability of faculty and instructors to teach and the ability of students to engage may result in my asking a student to temporarily leave the classroom. [See Undergraduate Catalogue - Classroom Code of Conduct \(p. 443-444\).](#)”

Grading Criteria/Policies

Grading breakdown:

5% student participation,

25% homework,

20% first midterm,

20% second midterm,

30% final exam.

Late Policy: I will generally not accept late homework, but I will drop the latest homework grade.

Midterms: These will both be in class. I will drop the lower grade, that is, the better of your two midterms grades will be used as your grade for both midterms. Attendance at both midterms is required.

Overall Grade: I am currently planning to use the standard grading brackets, but I may curve up at the end. I have no intention of curving down.

Academic Integrity and AI:

The [Academic Integrity policy](#) addresses plagiarism, fabrication, collusion, and cheating. Faculty may wish to supplement this policy with a clarifying statement regarding specific course rules, as these types of statements support student understanding of your course-specific expectations. The UVM Academic Integrity policy defers to faculty expectations outlined in the syllabus. Therefore, outlining these expectations can provide greater clarity when concerns about possible violations of academic integrity arise. Statements may include information such as: rules regarding collaboration on different types of assessments; use of supplementary materials such as dictionaries or other references; and expectations regarding use of AI.

A [Writing in the Disciplines](#) resource page offers guidance and [sample syllabus statements regarding student/classroom use of AI](#) that cover a range of pedagogies.

Assessments (Graded Work):

Homework: This will help you to better understand and internalize concepts from the class and the textbook. Homework will typically be assigned on Thursday and collected the following Thursday before class. I will generally not accept late homework, but I will drop the lowest grade. Do not cheat on homework or exams. I do not want to be in the position of catching you cheating, but if I do, I will report this.

I am planning to assign you to small groups for studying and collaborating on homework. You must spend at least 1 hour working on the homework alone before you collaborate. If you do not, then the other students are not obligated to work with you. While you may discuss the problems and write things down, you are not allowed to read other students' completed solutions; this is to prevent you from copying as well as to encourage you to develop your own mathematical writing style.

For every hour you spend in class you should spend roughly 2 hours outside of class so that's 6 hours per week for this class. I'm imagining that will be around 2-3 hours for reading & studying and 3-4 hours for the weekly assignment.

Midterms and Finals will be in-class, closed book, closed note. Do not cheat!

Recording Class Sessions:

*If you plan to record class sessions regularly, or even occasionally, **please include the following text and, before recording, please remind students that the session is being recorded.** Please consider carefully before requiring students to turn on their cameras for a given session. If you require audio participation as part of course grading, consider not recording the required discussion portion of your course.*

"Our class sessions may/will be audio-visually recorded for students in the class to refer back to, and for enrolled students who are unable to attend live. Students who participate with their camera engaged or utilize a profile image are agreeing to have their video or image recorded. If you are unwilling to consent to have your profile or video image recorded, be sure to keep your camera off and do not use a profile image. Likewise, students who un-mute during class and participate orally are agreeing to have their voices recorded. If you are not willing to consent to have your voice recorded during class, you will need to keep your mute button activated and communicate exclusively using the chat feature, which allows students to type questions and comments live."

Additional Policies

The following information and policies are helpful to include in your syllabus. If you use multiple files for your syllabus, you may also post this policy and information section separately on your Brightspace course site in a module you label Syllabus Files.

Lived Name and Pronoun Information

The UVM Directory includes fields for indicating your lived name and your pronouns. Lived names (preferred names, names in use) are names that an individual wants to be known by in the University community. Entering your pronouns is strongly encouraged to help create a more inclusive and respectful campus community. To update your information, login to the UVM Directory. A preview box will allow you to see how this information will appear in other systems used on campus such as Microsoft Teams and Blackboard.

More information about how to make changes to your lived name and pronouns is available in the [Knowledge Base](#).

Research and Citation Help

For help selecting research topics, finding information, citing sources, and more, ask a librarian. The UVM Libraries are eager to help. You may ask questions by phone, e-mail, chat, or text, or make an appointment for an individual consultation with a librarian.

Howe Library: <https://library.uvm.edu/askhowe>

Dana Medical Library: <https://dana.uvm.edu/help/ask>

Silver Special Collections Library: <https://specialcollections.uvm.edu/help/ask>

Course Evaluation:

Include a statement that all students are expected to complete an evaluation of the course at its conclusion. Indicate that the evaluations will be anonymous and confidential, and that the information gained, including constructive criticisms, will be used to improve the course.

If your department is using Blue for this class, you can link to the UVM Knowledge Base page with [student instructions on how to access Blue course evaluations](#).

General statement regarding potential changes during the semester:

<http://catalogue.uvm.edu/>

The University of Vermont reserves the right to make changes in the course offerings, mode of delivery, degree requirements, charges, regulations, and procedures contained herein as educational, financial, and health, safety, and welfare considerations require, or as necessary to be compliant with governmental, accreditation, or public health directives.

Intellectual Property Statement/Prohibition on Sharing Academic Materials:

Students are prohibited from publicly sharing or selling academic materials that they did not author (for example: class syllabus, outlines or class presentations authored by the professor, practice questions, text from the textbook or other copyrighted class materials, etc.); and students are prohibited from sharing assessments (for example homework or a take-home examination). Violations will be handled under UVM's Intellectual Property policy and Code of Academic Integrity.

Tips for Success (optional):

Course-specific study/preparation tips

Here are a few resources for students on remote/online learning:

- Checklist for success [in https://learn.uvm.edu/about/support-for-students/checklist-online-credit-courses/](https://learn.uvm.edu/about/support-for-students/checklist-online-credit-courses/)
- Academic support for online courses: <https://www.uvm.edu/academicsuccess/online-learning-student-resources-remote-instruction>
- 30-minute webinar on online learning success (Mar 2020): https://www.youtube.com/watch?v=Xp_MYsqQyvE

Helpful resources other than the professor (e.g., [Undergraduate/Graduate Writing Center](#), [Supplemental Instruction](#), [Learning Co-op tutors](#), supplemental course materials)

Student Learning Accommodations:

In keeping with University policy, any student with a documented disability interested in utilizing ADA accommodations should contact Student Accessibility Services (SAS), the office of Disability Services on campus for students. SAS works with students and faculty in an interactive process to explore reasonable and appropriate accommodations, which are communicated to faculty in an accommodation letter. All students are strongly recommended to discuss with their faculty the accommodations they plan to use in each course. Faculty who receive Letters of Accommodation with Disability Related Flexible accommodations will need to

fill out the Disability Related Flexibility Agreement. Any questions from faculty or students on the agreement should be directed to the SAS specialist who is indicated on the letter.

Contact SAS:

A170 Living/Learning Center;

802-656-7753

access@uvm.edu

www.uvm.edu/access

Important UVM Policies

Academic Integrity:

The [Academic Integrity policy](#) addresses plagiarism, fabrication, collusion, and cheating.

Code of Student Conduct:

[UVM's Code of Student Conduct](#) outlines conduct expectations as well as students' rights and responsibilities.

FERPA Rights Disclosure:

The purpose of UVM's [FERPA Rights Disclosure](#) is to communicate the rights of students regarding access to, and privacy of their student educational records as provided for in the Family Educational Rights and Privacy Act (FERPA) of 1974.

Final Exam Policy:

The University [final exam policy](#) outlines expectations during final exams and explains timing and process of examination period.

Grade Appeals:

If you would like to contest a grade, please follow the procedures [outlined in this policy](#).

Grading:

[This link](#) offers information on grading and GPA calculation.

Religious Holidays:

Religions may be practiced in many different ways, and can impact participation in classes variably. Students have the right to practice the religion of their choice. Each semester students should submit in writing to their instructors as early as possible and at least one week prior to their documented religious holiday the date(s) of the conflict or absence. Faculty must permit students who miss work or exams for the purpose of religious observance to make up this work. The complete policy is [here](#).

Promoting Health & Safety:

The University of Vermont's number one priority is to support a healthy and safe community:

[Center for Health and Wellbeing](#)

[Counseling & Psychiatry Services \(CAPS\)](#) Direct Phone Line: (802) 656-3340

C.A.R.E. If you are concerned about a UVM community member or are concerned about a specific event, we encourage you to contact the Dean of Students Office (802-656-3380). If you would like to remain anonymous, you can report your concerns online by [visiting the C.A.R.E. Team website](#).

Alcohol and Cannabis Statement:

Do not come to my class intoxicated. If you do, I will ask you to leave, and I may pursue disciplinary action. Don't let friends walk home alone drunk during the wintertime as they may fall into a snowbank and die.