Math 25 Syllabus

Instructor: Michael Dougherty
Fall 2021

Introduction

Overview

In a first course on calculus, we usually focus on derivatives, integrals, and the relationships between them. Among the key lessons is that differentiation is significantly more straightforward than integration; in particular, the definition of an integral requires us to evaluate the limit of a Riemann sum, which can be very difficult! Two questions immediately follow:

1. What techniques can we develop for evaluating integrals?
2. Can this notion of a limit of a sum be useful in other contexts?

This course focuses on answering these questions and exploring the applications that come from those techniques. Some of the topics include techniques for computing integrals, applications of integration to geometry and physics, convergence of sequences and series, Taylor approximation, and a brief introduction to differential equations.

Objectives

- Master techniques and applications for integration
- Improve geometric intuition in two and three dimensions
- Develop a conceptual and practical understanding of sequences and series
- Practice and improve mathematical communication and collaboration skills

Administrative Information

office: Science Center 148
office hours: M 3-4pm, Tu 10am-12pm, F 9-10am
email: mdoughe1@swarthmore.edu
course website: https://moodle.swarthmore.edu/course/view.php?id=20974

Textbook

Calculus: Single-Variable (Seventh Edition), Hughes-Hallett et al

Course Components

Active Learning

In this course, we place a heavy emphasis on in-class group learning. While there will still be some amount of traditional lecturing, you should expect to spend a large portion of each class period learning collaboratively with your peers. While the work you complete in class will not be graded on its correctness, you will still receive a grade based on your effort to collaborate with classmates.

Homework

Homework will be assigned weekly via the course website and is due on Wednesdays. You are allowed to work together on the homework - in fact, I encourage it! However, **your final solutions must be written independently**. If you work with one or more of your classmates, you should cite them at the top of your assignment. Each assignment will be collected in two parts. The first is completed electronically on WebWork and graded automatically. The second is hand-written (or typed, if you prefer) and hand-graded, but submitted online via Gradescope. You can find the links for both of these websites on Moodle.

Quizzes

Each week, you will complete a brief in-class quiz on your own. I will collect quizzes, give feedback, and return them to you, but they will not be graded. The goal of this activity is not for me to measure how much you know, but rather to act as a check-in so that you can adjust your study strategies if need be.

Projects

Throughout the course, you will complete a few projects on the course material. Some projects will involve groupwork (beginning in class and finished outside of class) and others will be done individually. In each project, you will be graded on the quality of writing as well as correctness. More information on the projects will be announced as we get closer to them.

Exams

We will have both a midterm exam and a final exam. Details regarding the format will be announced as we approach the exams. The midterm is tentatively scheduled for Wednesday, October 6, but this date is subject to change.

Grading Policy

The graded work in this course includes homework (both written and online), in-class participation, a midterm exam, a project, and a final exam. These categories combine to form your final grade according to the following breakdown:

In-class group work: 10%
Homework (online): 10%
Homework (written): 15%
Projects: 15%
Midterm: 20%
Final: 30%

In all forms of assessment, you must support your solutions by showing and explaining your work.

Office Hours

For a few hours each week, I will be available to chat about the course in my office. While it is often helpful if you come to office hours with a specific concept or question youd like to discuss, Im also happy to just chat about how things are going. You do not need to request time for my scheduled office hours - you can just drop by! If you cannot make it to my scheduled hours, let me know and I will be happy to find a time to meet with you.

Peer Assistants ("Pirates") and Math Clinic

Our Math 25 Pirates will hold Study Sessions three times a week: Sunday, Tuesday, Thursday nights 8-10pm (EST). These study sessions are a wonderful opportunity to study, do homework, meet/work with classmates, and ask questions about mathematics. Because study sessions are drop-in, you are welcome to come and go as you please. To make the most of your time at study sessions be sure to first try problems on your

own, or bring questions you have from your text or lecture. Having your textbook and lecture notes handy is essential because these are helpful resources for both you and the Pirate working with you. There will likely be other students at study sessions with questions for the Pirates, so do not expect to get individual attention the entire time you are there. Be open to working on other problems, thinking about and trying to work through the question you have for the Pirates, working with classmates, or doing other coursework while you wait to speak with the Pirates. In addition to the course specific Study Sessions held by Pirates, you are welcome to attend Math Clinic Sunday-Thursday nights 7-10pm. Utilizing Clinic is the same as making use of Pirate Study Sessions, but there may be students from different courses in attendance, as well. For questions about Pirate Study Sessions or Math Clinic please visit

https://www.swarthmore.edu/math-stat-academic-support/math-and-stat-clinics

or contact the Academic Support Coordinator for the Math/Stat Department.

Policies and Resources

Etiquette

Discussing mathematics can often be difficult - it takes practice! Please work hard to be considerate and respectful when talking to your classmates. Remember that we are not just machines attempting to solve math problems. We are humans as well!

Late Work

In general, I do not accept late work for credit and I do not offer makeup assignments. However, I am happy to be flexible in cases of emergency or other unavoidable circumstances. If you anticipate being unable to submit your work, please let me know as soon as possible.

Academic Integrity

While working collaboratively on homework is (strongly) encouraged, the submission of work which is not your own is strictly prohibited. This includes (but is not limited to) copying answers from peers or the internet. Explicitly, you may discuss assignments together, but your written work must be your own. When you do work with someone else or get help from an outside source, you must cite it accordingly.

Diversity and Inclusion

We value diversity and inclusion, and are committed to a climate of mutual respect and full participation in and out of the classroom. This class strives to be a learning environment that is equitable, inclusive, and welcoming, regardless of race, ethnicity, religion, gender and gender identities, sexual orientation, disability, socioeconomic background, and nationality. If you anticipate or experience any barriers to learning, please dont hesitate to discuss your concerns with me.

Disability Resources

We value disability as a form of diversity in this course. If you believe you need accommodations for a disability or a chronic medical condition, please contact Student Disability Services via email at

studentdisabilityservices@swarthmore.edu

to arrange an appointment to discuss your needs. As appropriate, the office will issue students with documented disabilities or medical conditions a formal Accommodations Letter. Since accommodations require early planning and are not retroactive, please contact Student Disability Services as soon as possible. For details about the accommodations process, visit the Student Disability Services website. You are also welcome to contact me privately to discuss your academic needs. However, all disability-related accommodations must be arranged, in advance, through Student Disability Services.

Religious Observations

If you anticipate that you will have a course conflict due to a religious observation, please meet with me as soon as possible so that we can make appropriate arrangements.