

Math 136: Calculus II

Spring 2021

Zoom, MWThF 10:30–11:20 (Section 02) or 3:30–4:20 (Section 06)

Instructor: Dr. Peter Bonventre
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Course Website: [Canvas](#)

Office Hours: TBD

Format. Online. Classes will be conducted synchronously on Zoom. Assignments will be submitted online through Canvas. Students are expected to participate during the class meeting.

Textbook. *Calculus: Early Transcendentals, 4th Edition* by Jon Rogawski, Colin Adams, and Robert Franzosa. You will need access to WebAssign. This comes bundled with a new physical book from the College bookstore, but can also be purchased entirely electronically through the online homework system.

Is this the right Calculus course for me? This course is designed for students who are interested in majoring in Mathematics, economics, physics, and chemistry, and either: (1) took Calculus in high school, did well in it, and feel confident about your understanding of it; (2) earned a score of 4 or 5 on the AP Calculus AB exam; or (3) successfully completed Math 135. For more information, see the [Holy Cross Math Department website](#).

Course Description. Math 136 is the second semester of a two semester sequence in single variable calculus. Like Math 135, it focuses on developing tools to understand functions of a single variable, and applying these tools to different scenarios. The main concepts are integration and its applications, as well as differential equations and sequences and series. Although the focus is no longer on differentiation, all the material about functions from the first semester, including differentiation, will be used throughout the course.

The subject will be approached from both a conceptual and a computational viewpoint. Rather than just learning a set of formulas, techniques, and algorithms, the theory and applications of calculus will be central to our study. Additionally, the course will also require you to effectively communicate your solutions.

By the end of the semester, you will be able to:

- compute integrals analytically using advanced techniques
- approximate definite integrals numerically and understand the limitations of these methods
- determine the convergence or divergence of an improper integral, infinite sequence, or infinite series
- find series for the elementary functions and estimate numerical values of series
- recognize when a physical or geometric quantity can be computed using integral calculus
- use integrals to compute arc length, surface area, and volume
- analyze mathematical models involving first-order differential equations

as well as

- set up and solve word problems
- explain the results and context of your computations
- interpret formulas and processes
- clearly communicate your solution process.
- collaborate and produce work with others
- investigate new definitions and theorems with examples and counterexamples.

The “Flipped” Classroom. To encourage the growth of these skills and learning outcomes, this course will be using a “flipped classroom” style of instruction. The majority of our class time together will consist of working on guided worksheets or projects in small groups. There will be less traditional lecturing so that active student learning is the primary focus.

While working in groups:

- *Share responsibility for making sure all voices are heard:* If you tend to have a lot to say, make sure you leave sufficient space to hear from others. If you tend to stay quiet in group discussions, challenge yourself to contribute so others can learn from you.
- *Understand that we are bound to make mistakes in this space:* Everybody (myself included!) does so when approaching complex tasks or learning new skills. In particular, you are invited to step outside your comfort zone!

Homework and Assessments. This flipped classroom approach will be scaffolded and complemented by the out-of-class assignments.

There will be three types of homework:

(1) **Daily Homework, due at the start of every class.**

In order to prepare for active in-class learning, there will be short daily assignments, taking the form of *Modules* in Canvas. Typically, these will include an introduction to the topic of the day, usually by either a short video lecture or a link to an online visualization, and a short Canvas quiz on the introduced material.

(2) **WebAssign Weekly Homework, due Mondays at 11:59pm.**

There will be weekly assignments on [WebAssign](#), covering material from the previous week. To access WebAssign, you will need a *class key*:

Section 002: **holycross XXXX XXXX**, Section 006: **holycross XXXX XXXX**.

You will have free access to WebAssign for two weeks. After that, you will need to purchase access, either bundled with a physical textbook, or online directly through WebAssign.

(3) **Written Homework, due every Friday at 11:59pm.**

The written homework will consist of a small number of more-involved problems. These will be submitted as Canvas Assignments. You must submit these assignments to Canvas as a PDF. However, they can be completed however you wish: printed, filled out, and scanned; filled out electronically; answers written on a blank piece of paper and scanned; etc. (There are apps to convert from pictures to PDFs, or take pictures as PDFs, if necessary.)

Additionally:

(4) **Quizzes, every Wednesday at the start of class.**

Each Wednesday will begin with an in-class, video-on quiz. It will be conducted through Canvas, and will be time-limited. These will cover the previous week’s material.

(5) **Exams: Projects**

There will not be timed exams. Instead, you will complete 3 take-home projects during the semester, and one after. These will be week-long assignments, completed with a partner. During the weeks these are due, there will be no quizzes or Group Homework due.

Tokens. Each student will have two **tokens**. These can be used to grant a 2-day extension on any WebAssign or Written Homework. Otherwise, late assignments will **not** be accepted. However, only the 10 best scores of each type (WebAssign, Written, Weekly Quiz) will count towards your final grade.

Grading. Grades will be assigned based on the following scheme:

Participation — 20%

WebAssign — 10%

Quizzes — 25%

Written Homework — 25%

Projects — 20%

Course expectations. This is a weird and difficult time for us all. I expect myself to work hard to make this class effective and flexible, and I expect you to do the same.

Math 136 students are expected to complete their assignments, come to class on time and ready to participate and engage with the material and their fellow classmates.

Additionally, you are responsible for announcements made in class, as well as any emails sent to your UK email account or announcements on the course website.

Attendance. Attendance is required. That being said, I expect there may be times where you are not able to make it to class, for a potential variety of health or personal reasons. If you must miss class, due to an illness or other pressing circumstance, please let me know as soon as possible. I will not ask for medical documentation or a note from a Class Dean. Instead, I will trust your judgement and voice in these matters, and expect that you will take ownership of this trust and act responsibly.

As listed above, participation is **20 percent** of your grade this semester. That includes the Daily Homework and attendance, as well as in-class work and engagement. Your effort and energy into our class time together is essential to this course. You get out what you put in; this grading scheme codifies that numerically.

Cameras. You may have considerations that will prevent you from keeping your camera on during our synchronous meetings, including internet speed or access issues, family responsibilities, or personal discomfort, so you may absolutely leave your camera off if you want or need to do so. To the extent that you are comfortable and able to turn your camera on, though, please feel free to do so (and be mindful of what's within your camera's view or which virtual background you're using!). This will help us to create a sense of connection and community in our class and encourage engagement with and trust in one another.

Please try, however, to mute your microphone unless you are actively speaking or would like to offer a thought or question. This is to ensure that we give due focus to whoever is speaking and to avoid being distracted by unintended background noise.

Academic Integrity. The Department of Mathematics and Computer Science has drafted a [Policy on Academic Integrity](#). Please read this policy in full. By taking this class, you assume responsibility towards following this policy. If you cheat in this class, you risk failing the course.

Collaboration. Mathematics is an inherently collaborative and social activity. On all of the homework assignments, you are encouraged to work together. However, the solution you submit for credit **must be your own work**. In particular, you should prepare your formal solutions to the written assignments independently, and you should submit your answers for web homework independently.

You are **not** allowed to work together on quizzes, nor use books, notes, the internet, etc.

Accommodations. It is my job to provide all students with an accessible and inclusive learning environment. Some aspects of this course, the assignments, the in-class activities, and the way the course is usually taught may be modified to facilitate your participation and progress. As soon as you make me aware of your needs, we can work with the [Office of Accessibility Services](#) to

determine appropriate accommodations. Any information you provide is private and confidential, and will be treated as such.

Advice.

- Work with others!
- Attend class, participate, and ask questions.
- Office hours are a great place to ask questions, go over material, and work through problems.
- Make an appointment with the **STEM+E Workshop** for peer tutoring.
- Learning is not fast, don't try to rush it. Be patient with yourself.
- Even if you think you are good at multitasking, you work better when you focus on a single task.
- Just because the first approach at a problem does not work, does not mean that the second or third will not. Sometimes the first thing you (or I) try doesn't work, but this does not necessarily mean that you do not understand the tools required to solve the problem.
- Start your homework sets early and work together! You should make major progress over the weekend so that you can ask questions in class and/or office hours.
- Start the webwork early. The first few will be easy, but they will get harder!
- Get help when needed! Find people you like working with!
- Just because the first approach at a problem does not work, does not mean that the second or third will not. Sometimes the first thing you (or I) try doesn't work, but this does not necessarily mean that you do not understand the tools required to solve the problem.

Important Dates.

- Easter Break: Thursday April 1 – Tuesday April 6
- Last day to withdraw with a W: Friday April 23
- Academic Conference Day: Wednesday April 28
- Last day of Classes: Friday May 7
- Finals: Wednesday May 12 – Tuesday May 18
- Commencement: Friday May 28