

Calculus 1

MATH 135-01, TuTh 2:00 - 3:15, Smith Labs 154, Spring 2016

Professor Gareth E. Roberts

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Office hours: Mon. 2:00 - 3:00, Tues. 10:00 - 11:00, Wed. 2:00 - 3:00, Thurs. 10:00 - 11:00 or by appointment.

Required Text: *Calculus: Single Variable (Early Transcendentals)*, third ed., Jon Rogawski and Colin Adams (bundled with WebAssign for \$145 in the College bookstore).

Web page: <http://mathcs.holycross.edu/~groberts/Courses/MA135/homepage.html>
Homework assignments, worksheets, class handouts, exam materials, useful links and other important information will be posted at this site. Please bookmark it!

Is this the right Calculus course for me? This course is designed for students interested in majoring in either Mathematics, Computer Science, Physics, Biology, Chemistry, Economics, or Accounting and who have **not** received a 4 or 5 on either the AB or BC advanced placement exams in Calculus. If you have taken an advanced placement course or a solid high-school course in Calculus, you should consider enrolling in Math 136, Calculus 2, since most of the course material will be a review for you. For more information, visit the *Mathematics Introductory Courses and AP Credit* section of the Math/CS Department's webpage.

Homework: There will be homework due every Thursday at the start of class, except for the weeks in which a midterm exam is scheduled. Homework will consist of two parts, an online component to be completed using the system **WebAssign** and a hand-written portion consisting of selected problems from the course textbook.

Late homework will not be accepted. While you are allowed and encouraged to work on homework problems with your classmates, the solutions you turn in or enter on the computer should be your own work. No help from any Internet sources other than those offered by WebAssign is allowed. Plagiarism will not be tolerated and will be treated as a violation of the Departmental Policy on Academic Integrity.

In order to access WebAssign, you will need a **Class Key**. The Class Key for this course is [holycross 2025 9243](https://holycross.edu/2025/9243). If you did not purchase an access code as part of your bundled textbook from the College Bookstore, then you will eventually need to purchase one directly from WebAssign. You will have free access to WebAssign until Feb. 9.

It is recommended that you take advantage of the **Calculus Workshop**, a drop-in peer tutoring center, open Sunday through Thursday from 7:00 - 9:00 pm in Swords 321. This is an excellent place to get help while you are working on homework problems or studying for exams. In addition, Jake Alofs (HC '17) will be serving as a modified teaching assistant for the class and will hold his own office hours as well as conduct exam review sessions.

Syllabus: The main focus of the course is the study of real-valued functions of a single variable, particularly, rates of change of functions. 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. The text has been chosen with this goal in mind. Many of the exercises require a solid understanding of concepts as opposed to a cursory “plug-and-chug” approach.

A tentative outline of the course is given below. We will cover most of the material in the text from Chapters 1 through 4.

- Functions: linear, exponential, logarithmic, trigonometric, polynomials, piecewise (3 classes)
- New functions from old: shifting, stretching, composition, inverses (2 classes)
- Limits: instantaneous velocity, asymptotes, graphical and numerical approaches (1 class)
- Exam I
- Limits: basic laws, continuity, algebraic evaluation of, squeeze theorem, limits at infinity, Intermediate Value Theorem (4 classes)
- The derivative: tangent line, limit definition of, derivative function, power rule (2 classes)
- Exam II
- Differentiation rules: product, quotient, chain rule, trig, implicit, exponential, logs (4 classes)
- Meaning of the derivative: rates of change, related rates (2 classes)
- Applications of the derivative: linear approximation, absolute extrema (1 class)
- Exam III
- Applications of the derivative: first and second derivate tests, curve sketching, L’Hôpital’s rule, optimization (3 classes)
- Calculus Jeopardy (last class)
- Final Exam (Cumulative)

The Flipped Classroom: Approximately half of the classes this semester will solely consist of problems and/or worksheets for you to complete in groups. For these classes there will not be a traditional lecture, but rather the class is “flipped” so that active student learning is the primary focus. You will be expected to prepare for these classes by completing a few problems on WebAssign and/or reading the text beforehand.

Exams: There will be three midterm exams given during class and a comprehensive final at the end of the semester. The exam schedule is given below. We will typically hold review sessions on the Tuesday evening before each midterm. Please make a note of these dates and plan accordingly. Any conflicts must be legitimate and brought to my attention well before the exam is scheduled. If you have any specific learning disabilities or special needs and require accommodations, please let me know early in the semester so that your learning needs may be appropriately met. You will need to contact the director of Disability Services in Hogan 215 (x3693) to obtain documentation of your disability.

Exam Schedule:	Exam 1	Thurs., Feb. 25	In Class
	Exam 2	Thurs., March 31	In Class
	Exam 3	Thurs., April 28	In Class
	Final Exam	TBA	2.5 hours

Academic Integrity: The Department of Mathematics and Computer Science has drafted a policy on academic integrity to precisely state our expectations of both students and faculty with regards to cheating, plagiarism, academic honesty, etc. You are required to read this policy and sign a pledge agreeing to uphold it. A violation of the Departmental Policy on Academic Integrity will result in a 0 for that assignment or exam, and a letter describing the occurrence of academic dishonesty will be sent to your Class Dean.

Grade: Your course grade will be determined by the scores you receive for each of the following items:

- participation (includes in-class work, preparedness, attitude, effort) 10%
- homework 14%
- midterm exams 51%
- final exam 25%

How to do well in this course:

- ATTEND CLASS, PARTICIPATE and ASK QUESTIONS.

I take pride in my lectures and will work hard to get you to master the course material. However, this will not be of much use to you if you don't attend class. Furthermore, on those special days when the classroom is "flipped," it is up to you to come prepared for class. Taking some initiative beforehand will result in a better learning experience for you. Do not take for granted the privilege you have of attending college. Value your time here and I will make it worth your while.

- DO YOUR HOMEWORK REGULARLY.

The best way to learn mathematics is to *do* mathematics. This means mastering the material to the point where you could explain it to your classmates and friends. "You don't really learn the subject until you teach it," is a common adage amongst mathematicians. It is not enough to know how to mimic an algorithm. A strong student should be able to follow and propose arguments as to why an algorithm is working or not working.

- WORK WITH YOUR CLASSMATES.

Some of the best assets available to you are the knowledge and abilities of your peers. Learn to explain mathematics to your classmates. Mathematics can be fun and rewarding when there are people around you who enjoy figuring out problems as much as you do. Take advantage of this opportunity and organize study groups outside of class.

- ASK FOR HELP WHEN NECESSARY.

Ask for help when you need to. One of the stumbling blocks for many math students (particularly us guys) is being afraid to ask for help. Just do it! It's actually ok to admit that you don't understand something. Some might even characterize it as a strength.

Never regard study as a duty, but as the enviable opportunity to learn.

— Albert Einstein