



Instructor: Kevin Hartshorn  
Department of Mathematics and Computer Science  
hartshornk@moravian.edu

Course Meeting: MWF 7:30am-8:40am, PPHAC 232

Course Website: <https://sites.google.com/a/moravian.edu/math-170a-fall-2015/>

Office Hours: Tuesdays 8-9am and 2-3pm, Wednesdays 2-3pm, Thursdays 8-9am,  
*or by appointment*  
PPHAC 215

## Overview

Calculus is the key tool to understanding and modeling many aspects of the real world. Measuring rates of change, speed, area, length, and volume are all in the purview of calculus, as is computing averages, finding centers of mass, or plotting trajectories. It is arguably the most important intellectual tool developed in the past 400 years, finding use in virtually every area of science, including physics, chemistry, biology, sociology, business, medicine, architecture, engineering, psychology, and astronomy.

## Main Ideas for the course

- Continuous changes can be approximated by discrete processes.
- Linearization is the key to understanding many functions.
- Solving problems requires finding the right model.
- Calculus is about the concept of the infinite.

## Course Objectives

In working toward internalizing these main ideas for the course, we will work to meet the following objectives:

- Master differentiation and integration methods and the concepts behind them,
- Demonstrate facility with functions graphically, algebraically, numerically, and verbally,
- Apply the methods of calculus to solving real world problems, and
- Discuss and present solutions to mathematical problems in written and oral form.

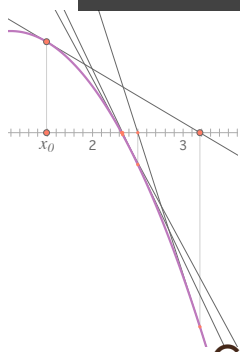
## F2 objectives

Math 170 fulfills the F2 requirement in the LinC curriculum. Each course in this category will develop the student's facility in quantitative reasoning through a wide variety of applications chosen from many fields and will involve converting conceptual information into problems that can be solved quantitatively; using appropriate techniques for analyzing and solving such problems; creating and reading pictorial and graphic representations of data and data analysis, including those showing relationships among or between multiple variables; using appropriate technology as a tool for quantitative analysis; and writing and interpreting results and solutions of problems.

## Required materials and texts

Rogawski and Adams *Calculus: Early Transcendentals* (3rd Edition) is the only required text (ISBN 978-1-4641-7174-1). Note that we are using the Early Transcendentals version of the text, and only require the Single Variable portion. This course will cover most of the first 5 chapters of the text. Math 171 (Calculus II) will cover chapters 6–10 of the text.

The TI-83 graphing calculator is recommended — *but not required*. There are several options available on your iPad to meet your graphing calculator needs.



## Required and recommended apps for the iPad (all are free downloads):

- Google Drive (*required*, free app)
- Desmos (recommended, free app)  
Some other graphing apps are listed on the class web page
- Notability (recommended, less than \$6)

## Grading and Assessment

Your course grade will be computed based on a raw percentage score, broken down as shown in the table below.

15%	Written problem sets
15%	<i>WebWork</i> activities
15%	Discussion and group work
5%	Culture Points
10%	Exam 1 (Wednesday, September 23)
10%	Exam 2 (Wednesday, October 28)
10%	Exam 3 (Wednesday, November 18)
20%	Final Exam (Monday, December 14 at 8:30am)

When computing your score at the end of the semester, an A (+ or –) is typically given to a score of 85% or above, a B (+ or –) to a score between 70% and 85%, a C (+ or –) to a score between 60% and 70%, and a D (+ or –) to a score between 50% and 60%. These values are subject to change and are meant only as a rough guideline, and the final assignment of grades will be determined based on the performance of the entire class and the judgement of the professor.

## Homework (written problem sets and *WebWork*)

You cannot learn mathematics without actively and personally grappling with problems. You will be given regular problem sets to explore new topics in mathematics. The problems assigned for homework represent a bare minimum, and you should work extra problems to ensure mastery of the material. It is vital that you do all the homework problems assigned; you should keep all your work in a binder or notebook for reference.

NOTE: Problem sets are *not* simple rehashing of what we cover in class. They are meant to expand your knowledge and constitute a vital part of the learning process.

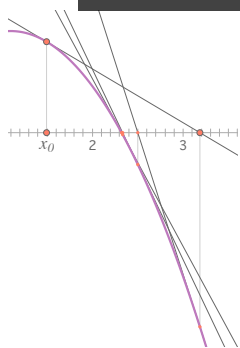
You will be assigned problems from the textbook as well as the online homework system *WeBWork*.

- Textbook problems: You will be given several problems from the text that call for a written reflection or deeper analysis of the topic. I will check these problems for completion at the beginning of class.
- *WebWork* problems: Your scores on the *WeBWork* on-line homework system will constitute the remainder of your homework grade. Details about *WebWork* is available on the class web site.

## Discussion and group work

Much of our time in class will be spent working in teams. Your team will collaborate on discussion questions and problems. Everyone in the group is expected to contribute to the discussion and actively participation. In addition, you will each be assigned a particular role each day:

- **Managers** are responsible for keeping the group on task and ensuring that your time is used efficiently.
- **Scribes** are responsible for writing and submitting the group's responses for the day.



- **Speakers** are responsible for reporting the group's work to the class. Often, we will present the scribe's written work and ask the speaker to explain.
- **Reflectors** are responsible for assessing how the group worked together. They need to identify areas of improvement.

By default, you will accrue 3 points each day of class through active participation. You may lose a point if (a) you are late to class, (b) you do not actively contribute to the learning environment, or (c) you do not appropriately meet your assigned role for the day.

If you do not attend class *for any reason*, you will get 0 points for the day. More details on this can be found the the Attendance Policy below.

## Culture Points

An important aspect of the calculus sequence is to introduce you to the idea of what a "mathematician" is and does. Calculus is but a tiny portion of mathematical thought, and we are only studying the topmost surface of calculus. To provide a broader perspective on the role of calculus in mathematics (and the role of mathematics in the world), I will be asking you to participate in mathematically-oriented activities throughout the semester. Details on this will be provided on a separate handout.

## Exams

There will be three exams in the course and a final exam. Details on the midterms will be provided as these dates approach. The final exam will be **Monday, December 14 (8:30am-11:30am)**, and takes place in our regular meeting room.

Be sure to mark these dates on your calendar. Remember, **flight or vacation plans are not acceptable reasons to miss an exam date**. As a general rule, make-up exams are not given. If you have a truly exceptional situation, be sure to see as soon as possible to discuss your dilemma.

If you have a conflict with your final exam (e.g.: two final exams scheduled at the same time), be sure to inform me **as soon as possible** so that alternate arrangements can be made.

## Course policies and information

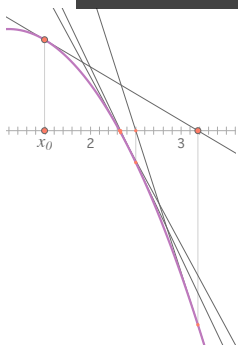
### Attendance

There are 43 class meetings this semester. Each class is important -- each class covers vital information for the course. Your absence can harm not only you, but also your teammates as your contribution to the group discussions will be missing. However, there are unavoidable circumstances every semester. To take this into account, **I will allow up to three absences without penalty to your in-class participation grade**.

Work for this class is your responsibility. If you miss a class, you can complete still receive credit for the homework for the day by submitting it electronically before 10am on the date due. Homework received after 10am will be considered late and will accrue either partial credit or no credit.

*If you know that you will be missing a class* (due to sports or other planned activities), let me know ahead of time. Together, we will decide whether alternate arrangements can be made for exams or other activities.

In all cases, **you** are responsible for any missed work and information. Be sure to contact your team members to help fill in the details that you missed for the day.



## Academic Honesty

Students will be expected to adhere to the standard of the Academic Honesty policy as described in the Student Handbook (<http://www.moravian.edu/studentlife/handbook/academic/academic2.html>). Any violations of this will result in severe penalties on the assignment, a report to the Dean, and the very real possibility of failing the course.

**Team work:** All work in class is meant to be worked on as a team. As a group, you are expected to discuss and come to consensus about the questions. Graphing calculators are encouraged, but you are **not** to use internet resources.

**Problem sets:** Homework problems from the text are *individual work*: you are expected to work on your own. If you have questions about the homework problems, consult with me or with the tutoring center. WebWork activities are meant to be completed on your own, having someone else complete your WebWork activities will be considered a violation of Academic Honesty.

Keep in mind that for the exams, you will be on your own. Copying from your friend helps no one.

## Tutoring and additional support

Beginning the second week of class, the Mathematics and Computer Science Department offers tutoring Monday through Thursday 5:30-8:30pm in PPHAC 238. This is free drop-in tutoring and does not require an appointment.

The Academic Support Center houses Disability Support and Greyhound Tutoring on the first floor of Monocacy Hall and can be reached at 610-861-1401. Greyhound Tutoring provides course-specific tutors to Moravian students, free of charge. If you would like to work with a Greyhound Tutor to boost your academic success, please request a tutor through <http://bit.ly/NeedTutorMC> (case-sensitive). Plan ahead! It takes 2-3 business days to connect you with a tutor.

Students who wish to request accommodations in this class for a disability should contact the Academic Support Center, located on the first floor of Monocacy Hall (extension 1401). Accommodations cannot be provided until authorization is received from the Academic Support Center.

## Other reminders, tips, suggestions

- Get to know your classmates. I actually recommend finding study partners outside of your team to broaden your base of collective knowledge. It is easy to feel overwhelmed, and your best defense is a group of classmates to share in your struggles.
- **Visit my office:** I would love to help address individual issues or answer questions you have about the course or to hear feedback about which aspects of the course are or are not going well. You have a great deal of power to determine the path this class takes — take advantage of it. You can also communicate with me via e-mail ([hartshornk@moravian.edu](mailto:hartshornk@moravian.edu)).
- Take advantage of the tutoring center. Beginning the second week of class, the math tutoring center is open Monday through Thursday evenings in the Math/CS reading room (PPHAC 238).
- *Khan Academy* (<http://www.khanacademy.org/>) provides a review of the mathematics that is expected of all students who are planning to take calculus. You can log in to *Khan Academy* using your Google or Facebook account. If you have trouble with any of the pre-calculus ideas used in this course, I recommend *Khan Academy* to provide some review.
- This syllabus is subject to change through the semester. The most recent version of the syllabus can be found at <https://sites.google.com/a/moravian.edu/math-170a-fall-2015/>.
- Final determination of your course grade is subject to my discretion as professor of the course.