

Math 112: Calculus II
Spring 2020
Pierce Hall Room L09
Section 1: MWF 12:10-1:00pm, T 9:40-11:00am
Section 2: MWF 1:10-2:00pm, T 1:10-2:30pm

Professor: Marie Snipes
Office: 309-C Hayes Hall
Phone: (740) 427-5929
Email: snipesm@kenyon.edu

Office Hours: M 10:10-11am and 2:10-3pm, T 2:40-3:30pm, W 10:10-11am, F 3:10-4pm,
and by appointment.

Webpage: <http://www2.kenyon.edu/Depts/Math/Snipes/Math112>

Lead Tutor: TBA

Math and Science Skills Center: Tomsich 207 (usu. 3rd Floor Hayes)
Sun/Tues/Thurs 7-10pm

Text: *Active Calculus*, by Boelkins, Austin, and Schlicker, version 2.1 (single variable ed.).

Software: Maple 2018

Prerequisite: MATH 111 or permission of the instructor.

Content: Math 112 is the second in a three-semester calculus sequence. This course continues the journey you began in Calculus I, where you studied rates of change and derivatives. In this course, we investigate **(1)** the relationship between derivatives and antiderivatives through a study of differential equations; **(2)** the relationship between rates of change and total change through a study of Riemann sums and definite integrals; and **(3)** infinite sums through a study of sequences and series. At each stage along the way we will study the ideas from multiple perspectives: formulas, graphs, numerics, and applications. You will hone your skills in thinking critically and communicating about mathematical ideas.

Course Philosophy: Although you can expect to gain proficiency with calculations and formulas, that is not really what calculus is all about. This course is designed to help you develop a conceptual understanding of the material from graphical, numerical, and symbolic points of view. You will practice articulating your understanding through class presentations and written work. Group work and technology (use of the Maple software package) will be an integral part of the class.

You should also expect to gain an appreciation for the ways in which integrals, sequences and series, and differential equations are used in modeling real-world processes!

Learning Objectives:

- Be able to translate between graphical, numerical, and symbolic points of view for key topics in the course.
- Use antiderivatives, definite integrals, and (signed) area to find total change from a rate of change.
- Work with limits and convergence tests to determine integrability of a function (on an interval), convergence of improper integrals, and convergence of sequences and series.
- Precisely use mathematical notation for Riemann sums, limits, integrals, sequences and series.
- Compute definite and indefinite integrals using methods of substitution, integration by parts, partial fractions, and combinations of these.
- Solve differential equations using slope fields, Euler's method, and antidifferentiation.
- Apply the tools of integration, differential equations, and series to model and analyze situations in other fields including economics, biology, physics, and chemistry. (Transfer knowledge across disciplines)
- Describe the connection between power series and functions; use power series to solve calculus problems.

Grading Policy:

Preview activities	5%
Daily Homework	15%
Group Projects	10%
Participation and Attendance	5%
Gateway Exam	10%
Three Midterms	10% each
Cumulative Final Exam	25%

Regular class attendance and class participation are expected. Due to the nature of the course, a failure to fulfill these expectations will result in a lower course grade.

Exams:

First Midterm	Tuesday, February 11	(in class)
Second Midterm	Tuesday, March 24	(in class)
Third Midterm	Tuesday, April 14	(in class)
Cumulative Final Exam (Sec. 1)	Wednesday, May 6	(6:30 – 9:30pm)
Cumulative Final Exam (Sec. 2)	Tuesday, May 5	(6:30 – 9:30pm)

Preview Activities: These activities are designed to introduce you to the material that will be discussed/worked on in class. You receive full credit for activities that you complete thoughtfully before class. No credit is given for late completion of preview activities.

Homework: Homework will be assigned after most classes and will generally be due the following class meeting. The lowest three homework scores will be dropped from the final homework average.

Homework is due at the beginning of class on the due date; late homework will not be accepted. See pages 4-5 for more information about about daily homework assignments.

Group Projects: In addition to individual homework, two to three group projects will be assigned over the course of the semester. These projects provide you an opportunity to investigate an interesting application of calculus in more depth and to communicate your findings. More information on these projects will be provided later in the semester.

Gateway Exam: The gateway exam will cover integration rules and will be given in class shortly after these rules have been covered. The exam consists of five integration questions, all of which must be solved correctly without the use of a calculator. It may be taken up to twice a day outside class, but must be passed within three weeks of the initial test date in order to receive credit for this component of the course.

Academic Honesty: Students are encouraged to work with other students on outside assignments. However, every piece of written or computer-generated work that you submit must be your own. Students who work with or receive help from other students MUST include attributions in their assignments. Finally, on group assignments all group members should contribute equally to the final product—putting a member’s name on a paper written by others constitutes a breach in academic honesty.

Special Arrangements: A student with a disability who thinks they need an accommodation to access a campus program, activity, or service should contact Erin Salva in Student Accessibility and Support Services (SASS) at salvae@kenyon.edu to discuss specific needs. Advance notice is required to review documentation, evaluate accommodation requests and provide notice or arrangements for any accommodation.

Other Resources: Kenyon College seeks to provide an environment that is free of bias, discrimination, and harassment. If you have experienced any form of harassment/misconduct/assault, interpersonal violence, or stalking we encourage you to report it. If you report the incident to a faculty member, they must notify Kenyon’s Civil Rights & Title IX coordinator of any information about the incident you provide. More information can be found on the following College web pages:

Sexual Misconduct & Harassment Policy: Title IX, VAWA, Title VII:

<https://www.kenyon.edu/directories/offices-services/ocr/title-ix-vawa/kenyon-policies/title-ix-policy/>

Discrimination & Discriminatory Harassment Policy:

<https://www.kenyon.edu/directories/offices-services/ocr/discrimination/>

ADA/504 Student Grievance Procedures:

www.kenyon.edu/directories/offices-services/ocr/discrimination/504-ada-grievance/student-grievance-procedure-resolving-complaints-under-ada-section-504/

Assignment Policies

Assignments are listed on the course webpage at <http://www2.kenyon.edu/Depts/Math/Snipes/Math112/assignments.html>.

The written assignments are designed to give you practice with concepts from the course and to give you feedback on your understanding of the material. Assignments will help you pull together course material, and you should look at them as opportunities to build connections.

- Assignments must be turned in by the start of class on the due date! Late work will not be accepted.
- At the top of each assignment, please include the following:
 - Your Name
 - Math 112, Section ____
 - Date due
 - Homework #
 - Collaborators: (specify “none” if you worked entirely independently)
- Assignments requiring multiple pages must be stapled (not paper-clipped).
- Homework must be typed or neatly handwritten.
- Problem statements must be included with your homework. One easy way to do this is to include the printout of the problems with each problem set (though you will need to transcribe problem statements for any textbook problems if the statements are not included in the assignment).
- Graphs and other computer output (if applicable) need to be interleaved with explanations!
- Answers without explanations and calculations will not receive credit. Where appropriate you should answer in complete sentences.
- I expect you to complete the assignments without consulting any resources other than the class textbook.
- I encourage you to work with other students in the class on homework assignments, but you should attempt all the problems on your own before collaborating. If you do work with other students in the class, you should still understand the solutions well enough to write them up independently (without, for example, a picture of the whiteboard with the group’s work in front of you). Your final writeups must be your own work – turning in identical assignments constitutes a breach of academic integrity.
- List the names of any students you worked with or who gave you assistance.

Please also follow the Mathematics and Statistics Department guidelines on healthy collaboration. These can be found at <http://www.kenyon.edu/academics/departments-programs/mathematics/academic-program-requirements/guidelines-for-collaboration-on-homework/>

I strongly recommend that you start the homework as early as possible to allow you ample time to think about the problems and to seek help if necessary.

I am always happy to talk about homework problems during my office hours (or at another arranged time). The Math and Science Skills Center also has tutoring available on Su/Tu/Th from 7-10pm. Many students have found it helpful to work on homework (often in groups!) during these hours.

For extra practice, I encourage you to work extra problems from the book – and if you have questions about problems that were not assigned, I would be happy to talk to you about them in office hours!