

Math 102: Calculus II Spring 2019

What's there to know about integration? Isn't it just the opposite of differentiation? Well, yes and no. In theory, calculating them only requires finding an antiderivative. But in practice, this is a very complicated process – and sometimes is not even doable. We'll talk about some of the ways one goes about doing that, and also discuss some applications of integration that you probably didn't see in first-semester calculus.

Later on, we will be free to explore more exotic topics. How does a calculator know how to calculate sines, logarithms, and other transcendental functions? Why is π equal to $4 - \frac{4}{3} + \frac{4}{5} - \frac{4}{7} + \frac{4}{9} - \dots$? How might one describe curves in the plane that aren't graphs of functions?

You'll notice some themes running through the course, such as growth and decay rates of functions, or the usefulness of thinking in terms of angles rather than purely in terms of lengths. And by the end, we'll be able to tie everything together in the most beautiful formula in all of mathematics.

Instructor: Stephen Wang (sswang@rice.edu)

Classroom and Course Times: SST 106, MWF 10-10:50.

Office and Office Hours: Herman Brown Hall 410, tentatively Tuesdays 3:30-5 and Thursdays 2-3:30, or by appointment.

In addition, you are encouraged to make use of the Calculus Help Sessions. These are held in Herring 129, Monday through Thursday, 7pm-9pm.

Exams: This course will have two midterms and a final exam. The first midterm will be 7-9 PM on **Thursday February 14**, and the second midterm will be 7-9 PM on **Thursday March 28**. If you have a conflict with these dates you must let me know by the end of the first week of class.

The date for the final exam is set by the Registrar's office and is not available at this time. It is the policy of the Mathematics Department that no final may be given early to accommodate student travel plans. If you make travel plans that later turn out to conflict with the scheduled exam, then it is your responsibility to either reschedule your travel plans or take a zero on the final.

Textbook: OpenStax Calculus, Volume 2 (available free online). We will cover most of Chapters 3, 5, 6, and 7, plus some extra material (Fourier polynomials, complex numbers).

Grades: Your course grade will be based 70% on the exams¹, distributed among Midterm 1/Midterm 2/Final as 20/20/30 or 20/15/35 or 15/20/35, whichever benefits you the most. 23% of your course grade will depend on homework. The remaining 7% will be based on class participation - attendance, engagement in class activities, etc.

Homework: There will be two types of homework. The first type is online, on WebWork; students log in at:

`http://webwork.math.rice.edu`

Use your Rice NetID (without the @rice.edu) as your login, with your Student ID (S followed by 8 digits) as your initial password (you can change this). There will be a few problems due most class days.

The second type of homework is done on paper. This is due every week at the beginning of class on Fridays.

No late homework will be accepted, barring a documented serious illness or other emergency. However, the two lowest-scoring Webwork assignments will be dropped, along with the lowest-scoring written homework.

You should work individually on the problems at first. Collaboration and discussion with others is encouraged, but only after you have given the problems a good amount of independent thought. Similarly, I am more than happy to talk with you about the homework, but only provided that you've worked on it some before coming to me.

If you have worked with others on the online homework, you must make sure that you can re-create all of the necessary work to arrive at an answer on your own, before you submit the answer.

On the written homework, please note the names of any collaborators on each problem. Furthermore, the final write-up of the problems should be done by yourself. You should show the steps you took in order to arrive at your answer, and you should understand what you are writing well enough that you need not refer to any writing or notes produced during your collaboration.

Do not use outside software (including calculator functions that go beyond the normal $+$, $-$, \times , \div and exponentiation) unless otherwise specified. Do not seek help from internet forums.

Following these instructions is part of your duty under the Rice Honor Code.

Disability Support: Students who think they may need accommodations in this course because of the impact of a disability should give me a written letter from Disability Support Services within the first two weeks of the course.

¹When computing final course grades, a student's exam scores are normalized against scores of all students in Math 102 this semester, not just those in this section.