

Introductory Calculus (Math 120, Section 4) Fall 2023

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Updated on December 4, correcting the final exam date

1 Basic Information

Classes meet. 1:00–1:50pm Monday, Wednesday and Friday in MYBK 113 and 1:40–2:55pm Thursday in MYBK 219.

Textbooks. All course materials are free, available as both websites and PDF, and with the option of buying inexpensive paperback versions.

- The primary source is [Calculus, Volume 1](#)¹ from [OpenStax](#)².
- I also provide a study guide based on my in-class presentations, with further examples, recommended exercises, homework assignments and so on; that is available at the website <https://lemesurierb.people.cofc.edu/math120-notes/>³ and as a PDF file at <https://lemesurierb.people.cofc.edu/math120-notes.pdf>⁴, and will be in [OAKS](#)⁵.

Professor's Office hours. Monday 10–11, Wednesday 2–3, Thursday 11–noon, and also on request after any class, and by appointment.

Professor's Office. Room 344, Robert S. Small Building.

Professor's Email Address. lemesurierb@cofc.edu

Professor's Websites. <http://lemesurierb.people.cofc.edu/> and <http://blogs.cofc.edu/lemesurierb/>, but once the course starts, most online communication will be through [OAKS](#)⁶.

Prerequisites. Placement, or C⁻ or better in MATH 111.

2 Course Objectives and Student Learning Outcomes

The main goal of this course is for students to learn the basic concepts and skills of solving mathematical and scientific problems described by functions that vary "smoothly" (with no jumps, breaks or sharp corners

¹openstax.org/details/books/calculus-volume-1/

²openstax.org

³lemesurierb.people.cofc.edu/math120-notes/

⁴lemesurierb.people.cofc.edu/math120-notes.pdf

⁵lms.cofc.edu/

⁶lms.cofc.edu/

in their graphs) and to solve problems whose solutions can at best only be approximated with algebra, geometry and trigonometry (like the areas of most regions), but can be solved exactly with the methods of calculus.

Applications include the description of motion in terms of velocity and acceleration, models of population growth, chemical reaction rates and growth of the value of an investment, and optimization problems such as minimizing the cost of a task or maximizing what can be achieved with a fixed amount of resources. This material is covered in the first five chapters of the text, with a few sections omitted or left until Calculus 2 (Math 220).

Students are expected to do not only the graded online assignments and class exercises but also to review each section of the text after it has been covered in class and to attempt the exercises set for each section. This is because, more broadly, *a majority of the learning in this or any college course comes through students' efforts outside the classroom.*

By the end of the course, students should be able to:

- Calculate a wide variety of limits, including derivatives using the limit definition and limits computed using l'Hospital's rule;
- Demonstrate understanding of the main theorems of one-variable calculus (including the Intermediate and Mean Value Theorems, and the Fundamental Theorem of Calculus) by using them to answer questions;
- Compute derivatives of functions with formulas involving elementary polynomial, rational, trigonometric, inverse trigonometric, exponential and logarithmic functions;
- Use information about the derivative(s) or antiderivative of a function (in graphical or symbolic form) to understand a function's behavior and sketch its graph;
- Construct models and use them to solve related rates and optimization problems;
- Recognize functions defined by integrals and find their derivatives;
- Approximate the values of integrals geometrically or by using Riemann sums; and
- Evaluate integrals by finding simple antiderivatives and by applying the method of substitution.

These outcomes will be assessed on the final exam.

3 General Education Student Learning Outcomes

This course can be used to satisfy some general education requirements, for which there are some standard goals. Students are expected to display a thorough understanding of the topics covered. In particular, upon completion of the course, students will be able to

1. model phenomena in mathematical terms,
2. solve problems using these models, and
3. demonstrate an understanding of the supporting theory behind the models apart from any particular application.

These outcomes will be assessed on the final exam.

4 Calculators

It might be useful to have a graphing calculator, and the standard recommendation is the Texas Instruments TI-84 Plus. However, many choices of free "calculating device" can work too, including websites, phone apps and computer software, and I will demonstrate some of them. One of my favorites is the [Desmos](#)

[Graphing Calculator](#)¹; in addition to that website interface, this is available as a free app for [iPhones](#), [iPads](#)², and [Android](#)³ devices.

There are also several other tools at the [Desmos](#)⁴ website, such as a Scientific Calculator.

Such tools may be used for some homework and in-class exercises, but not on tests or the final exam.

5 Graded Work and Grading Scheme

5.1 Homework Exercises for Practice

The study guide will give a list of exercises for each section covered, to help your study. These are not for grading but doing them is an *essential* part of the course; like learning a musical instrument or sport, success in mathematics requires a lot of practice beyond what your instructor sees and grades you on.

5.2 In-class Exercises

There will be some in-class exercises for extra credit. You are encouraged to work on these in groups and ask me questions, but you should each write up and hand in your own version of the results.

5.3 Weekly Quizzes

There will be a short quiz on most Thursdays; the questions will be similar to some of the homework exercises for the sections covered since the previous quiz.

5.4 Mid-semester Tests

There will be three tests, scheduled for the Thursday classes of *September 14*, *October 12*, and *November 16*. These will be partially cumulative: each will focus on material covered since the previous test, but questions can often rely on ideas and methods learned earlier in the semester. (Math is like that.)

If you miss a test for a good, documented reason, the score can be replaced by your results on the corresponding part of the final exam.

5.5 Final Exam

The final exam will be held from *1:00 to 3:00 pm on Thursday December 7*; this will cover the whole syllabus, but with more emphasis on topics seen after the last test.

5.6 Grading Scheme

The combined scores for quizzes and in-class exercises will count for 20% of the course total, as will each test and the final exam.

However, if the final exam score is better than the lowest test score or the assignment-classwork average, the exam score will carry an additional 10% weight and that low score will count for 10% less.

The aggregate score guarantees at least the following grades:

A	A ⁻	B ⁺	B	B ⁻	C ⁺	C	C ⁻	D ⁺	D	D ⁻
90–100	87–89	84–86	80–83	77–79	74–76	70–73	67–69	64–66	60–63	57–59

¹www.desmos.com/calculator/

²apps.apple.com/us/app/desmos-graphing-calculator/id653517540

³play.google.com/store/apps/details?id=com.desmos.calculator

⁴www.desmos.com

6 Participation Requirements

Attendance to all classes is expected, as is active participation in all the work described above. You are responsible for knowing what happens in each class including assignments, information about test topics, and due dates: thus if you miss a class, check for news, either from a classmate or from me; checking the course's section in [OAKS](#)¹ should help.

Absence from a test or more than three quizzes without adequate explanation will lead to failing the course; thus if you miss any of these, contact me promptly to explain why.

7 Office Hours, and Additional Help from Tutors in the Math Lab at CSL

My office hours are

- Monday 10–11
- Wednesday 2–3
- Thursday 11–noon

and also on request after any class, and by appointment.

You can also get tutoring help in the Math Lab, located in the Addlestone Library, one of the walk-in labs at the Center for Student Learning: <http://csl.cofc.edu/labs/math-lab/> There you will find students and some professors who will help you with any specific problems or questions you may have.

The hours are 10am-9pm on Monday through Thursday, from 10am-1pm on Fridays and 5pm-9pm on Sundays.

8 Accommodations for Students with Disabilities

If you have a documented disability, please contact me during the first two weeks of class or as soon as you have been approved to receive accommodations, so that reasonable accommodations can be arranged. Approval for such accommodations is arranged through the Center for Disability Services: see <http://disabilityservices.cofc.edu/accommodations/>

9 College of Charleston Honor Code and Academic Integrity

Lying, cheating, attempted cheating, and plagiarism are violations of our Honor Code that, when identified, are investigated. Each incident will be examined to determine the degree of deception involved.

Cases of suspected academic dishonesty will be reported directly to the Dean of Students. A student found responsible by the Honor Board for academic dishonesty will receive a XXF in the course, indicating failure of the course due to academic dishonesty. This grade will appear on the student's transcript for two years after which the student may petition for the XX to be expunged. The F is permanent. The student may also be placed on disciplinary probation, suspended (temporary removal) or expelled (permanent removal) from the College by the Honor Board.

Students should be aware that unauthorized collaboration or working together without permission is a form of cheating. Unless the instructor specifies that students can work together on an assignment, quiz and/or test, no collaboration during the completion of the assignment is permitted. Other forms of cheating include possessing or using an unauthorized study aid (which could include accessing information via a cell phone or computer), copying from others' exams, fabricating data, and giving unauthorized assistance.

¹lms.cofc.edu

Students can find the complete Honor Code in this page about the [Honor System](#)¹; see also this page about the [Student Handbook](#)².

10 Some Important Dates and Times

Monday August 28	Last day to drop/add courses.
Monday September 4	Labor Day—classes <i>do</i> meet.
Monday September 4	The Math Lab ¹ opens.
Thursday September 14	Test 1.
Saturday September 23	Storm make-up day, if needed (classes will be made-up online).
Sunday September 24	Storm make-up day, if needed (classes will be made-up online).
Thursday October 12	Test 2.
Monday and Tuesday, October 16 and 17	Fall Break—no classes.
Friday October 27	Last day to withdraw with a grade of “W”.
Saturday November 11	Storm make-up day, if needed (classes will be made-up online).
Sunday November 12	Storm make-up day, if needed (classes will be made-up online).
Thursday November 16	Test 3.
Wednesday to Sunday, November 22–26	Thansgiving Break.
Monday December 4	Last day of classes.
Tuesday December 5	Reading Day.
(Wednesday December 6, 1–3pm	Final Exam, alternate date.)
Thursday December 7, 1–3pm	Final Exam.

¹deanofstudents.cofc.edu/honor-system/

²deanofstudents.cofc.edu/honor-system/studenthandbook/

¹csl.cofc.edu/labs/math-lab/