Calculus for Business and Social Sciences (Math 116, Section 3) Spring 2024

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Updated on January 11, announcing the Math Lab opening on January 22.

1 Basic Information

Classes meet.   Monday, Wednesday and Friday from 10 to 10:50 am in MYBK 100.

Text and Online Learning System.   The main text is *Essential Calculus with Applications* by Franklin Wright, Spencer Hurd, and Bill New (3rd edition), from Hawkes Learning[1], which will be used in conjunction with the online Hawkes Learning System ("Hawkes" for short). Thus you should get Hawkes access (and *optionally*, the printed book), either from the College of Charleston bookstore or directly at Hawkes Learning: Electronic Version + Software ISBN: 978-1-944894-45-0.

Then create a Hawkes Learning account: follow the steps at `http://www.hawkeslearning.com/Students.htm`

Professor's Office Hours.   To see me out of class, there are two options:

- After any class
- by appointment: arrange by email or by talking with me in-class.

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

Professor's Email Address.   lemesurierb@cofc.edu

Professor's Website.   `http://lemesurierb.people.cofc.edu/`, but once the course starts, most online communication will be through OAKS and the Hawkes Learning System.

Prerequisites.   Placement, MATH 110 or MATH 111.

2 Course Objectives and Student Learning Outcomes

The goal of this course is to learn the calculus tools for use in business and the social sciences. There are two main parts to this:

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[1]hawkeslearning.com

- *derivatives*, which measure things like the slope of a curve, the speed of a moving object and more generally how fast one quantity (say cost or population size) changes in response to change in some other quantity (say quantity produced or time.)

- *integrals*, which measure things like the area under a curve, the distance traveled by a moving object based on information about its speed and more generally the total change in a quantity based on information about how fast it is changing.

In more detail, my goal is to enable students to understand and communicate the mathematics of the world around them, to improve problem-solving and critical thinking skills, and to enhance student's qualitative and quantitative reasoning skills by using mathematical models to represent problem situations graphically, algebraically, numerically and verbally. Our focus will be on understanding aspects of calculus such as functions, limits, continuity, derivatives, integrals, and the application of these ideas to real world problems, specifically those related to Business, Economics, and Social Sciences.

After successfully completing this course, students will be able to

1. *compute and interpret derivatives and antiderivatives.*

2. *use functions and graphs to model phenomena relevant to business and the social sciences.*

3. *produce and interpret graphs of functions.*

4. *use calculus to solve optimization problems.*

I will also emphasize some generally useful mathematical skills:

1. Learning correct use of mathematical notation and organization of thinking and written presentations so that it can be understood by peers and instructors.

2. Facility and accuracy in basic computational manipulations so that these steps do not get in the way of understanding and solving the main questions at hand.

3. Reading, working exercises and developing concise written summaries of important formulas, notation and ideas, to help with study and test preparation.

These outcomes will be assessed on the tests and the final exam.

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

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 succesful 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 tests and the final exam.

4 Computers and Calculators

We will use computers in class for online quizzes and other activities, so you will need to bring one to class.

A calculator will be needed, paticularly for the tests and final exam. For work done online, you could use an online calculator like The Desmos Scientific Calculator[1] but for written work like the tests and final exam, a hand calculator will sometimes be needed.

Calculators must be ones that do *not* include symbolic computation abilities; the standard recommendation for math courses is a Texas Instruments TI-83 or TI-84.

P. S. The above Desmos Scientific Calculator does not do graphs, but for that there is The Desmos Graphing Calculator[2], which I also use in class sometimes. These are both also available as free apps for Android and iOS.

5 Exercises, Graded Work and Grading Scheme

5.1 Online Exercises and Homework

The Hawkes Learning System will be used for online exercises, both as homework and in-class; these are referred to in Hawkes as "Lessons", and there are one or two for each section of the text that we cover. Each lesson has three modes:

- *Learn*, which is akin to a complete online textbook,
- *Practice*, which leads you through exercises in the style of those that will then be in ...
- *Certify*, which is the exercises for actual credit.

This uses a "mastery" approach: when you do not get the correct answer on a topic it offers a hint, and can send you back from Certify mode to Practice mode.

I encourage you to write down your working (on paper or a tablet or such) and then enter your results; for one thing, if you have questions about an exercise, showing me your written work can help me to answer.

5.2 Weekly Quizzes

There will be a short quiz most weeks, usually on Friday; the questions will be similar to some of the exercises for the topics covered since the previous quiz. These will again be done online using the Hawkes Learning System. However, *do your work on paper before entering results online*; I will collect this and use it to give partial credit on questions that you got wrong (Hawkes does not give any partial credit).

5.3 Group Work

In some classes there will be written exercises to be done in small groups.

5.4 Mid-term Tests

There will be two mid-term written tests, provisionally scheduled for the Friday classes of *February 16* and *March 29*. 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, I will have you do the test as homework for practice; then the score can be replaced by your results on the corresponding part of the final exam.

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[1] www.desmos.com/scientific
[2] www.desmos.com/graphing

5.5 Final Exam

The final exam will be held *from 10:30am to 12:30pm on Monday April 29*, as determined by the College's exam schedule[1]. It will cover the whole syllabus, but with more emphasis on topics seen after the second test.

5.6 Grading Scheme

- The online homework will count for 20% of the course total,

- the quizzes and group work will count for 20%,

- each mid-semester test will count for 15%,

- and the final exam will count for the remaining 30%.

However, if the final exam score is better than the lowest test score or the quiz 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

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 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 Additional Help from Tutors in the Math Lab at CSL

You can 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/

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[1] registrar.cofc.edu/pdf/exam-schedule-spring2024.pdf

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.

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 January 15	Martin Luther King Day—no classes.
Wednesday January 17	Last day to drop/add courses.
Monday January 22	The Math Lab[1] opens.
Saturday January 27	Storm make-up day, if needed (classes will be made-up online).
Sunday January 28	Storm make-up day, if needed (classes will be made-up online).
Saturday February 10	Storm make-up day, if needed (classes will be made-up online).
Friday February 16	Mid-term Test 1, proposed date.
March 3 to 9	Spring Break—no classes.
Friday March 22	Last day to withdraw with a grade of "W".
Friday March 29	Mid-term Test 2, proposed date.
Wednesday April 24	Last day of classes.
Thursday April 25	Reading Day.
Monday April 29, 10:30am–12:30pm	Final Exam.

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[1]deanofstudents.cofc.edu/honor-system/
[2]deanofstudents.cofc.edu/honor-system/studenthandbook/
[1]csl.cofc.edu/labs/math-lab/