Calculus for Business and Social Sciences (Math 116, Section 4)
Spring 2023

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1 Basic Information

Classes meet. Tuesday and Thursday 9:25–10:40 pm in RSS 106.

Text and Online Learning System. The main text is Essential Calculus (2nd edition) by Franklin Wright, Spencer Hurd, and Bill New, from Hawkes Learning\(^1\), which will be used in conjunction with homework software from Hawkes. Thus you should get both the book and homework access, 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

Office hours. To be arranged during the first week of classes; for now I am available immediately after each class and by appointment, either in my office or via Zoom.

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.

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:

\(^1\)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 successful 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

You will need to bring a computer to class; we will use these both for online quizzes and other activities.

No calculator is strictly required; where a calculator might be useful, there are free alternatives such as the online tool the Desmos Graphing Calculator\(^1\). In addition to that website interface, Desmos is available as a free app for iPhones, iPads\(^2\), and Android\(^3\) devices. There are also several other tools at the Desmos website\(^4\), such as a Scientific Calculator\(^5\).

If you do plan to use a calculator, it should be one that does not include symbolic computation abilities; the standard recommendation for math courses is a Texas Instruments TI-83 or TI-84.

5 Exercises, Graded Work and Grading Scheme

5.1 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 Online Homework

The Hawkes Learning System will be used for online homework. This uses a "mastery" approach where when you do not get the correct answer on a topic, it helps you review and then try a new version of the question.

5.3 Weekly Quizzes

There will be a short quiz in most Thursday classes; the questions will be similar to some of the exercises for the topics covered since the previous quiz. Some or all of these will again be done online using the Hawkes Learning System.

5.4 Mid-term Tests

There will be two mid-term tests, provisionally scheduled for

- Thursday February 16 and
- Thursday March 30

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.)

There are no make-up tests. 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.

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1. \(\text{www.desmos.com/calculator/}\)
2. \(\text{apps.apple.com/us/app/desmos-graphing-calculator/id653517540}\)
3. \(\text{play.google.com/store/apps/details?id=com.desmos/calculator}\)
4. \(\text{www.desmos.com}\)
5. \(\text{www.desmos.com/scientific}\)
5.5 Final Exam

The final exam will be held from 8 to 10 am on Tuesday May 2; it will cover the whole syllabus, but with an emphasis on topics seen after the second test.

5.6 Grading Scheme

- The online homework will count for 30% of the course total,
- the quizzes will count for 15%,
- each mid-semester test will count for 15%,
- and the final exam will count for the remaining 25%.

*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:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90–100</td>
</tr>
<tr>
<td>A−</td>
<td>87–89</td>
</tr>
<tr>
<td>B+</td>
<td>84–86</td>
</tr>
<tr>
<td>B</td>
<td>80–83</td>
</tr>
<tr>
<td>B−</td>
<td>77–79</td>
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<tr>
<td>C+</td>
<td>74–76</td>
</tr>
<tr>
<td>C</td>
<td>70–73</td>
</tr>
<tr>
<td>C−</td>
<td>67–69</td>
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<td>D+</td>
<td>64–66</td>
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<tr>
<td>D</td>
<td>60–63</td>
</tr>
<tr>
<td>D−</td>
<td>57–59</td>
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</tbody>
</table>

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

I will hold office hours at times to be arranged with the class, as well as being available immediately after classes.

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/](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.

### 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/](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.

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

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>Monday January 16</td>
<td>Martin Luther King Day—No classes.</td>
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<tr>
<td>Wednesday January 18</td>
<td>Last day to drop/add courses.</td>
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<tr>
<td>Saturday January 28</td>
<td>Storm make-up day, if needed (classes will be made-up online).</td>
</tr>
<tr>
<td>Sunday January 29</td>
<td>Storm make-up day, if needed (classes will be made-up online).</td>
</tr>
<tr>
<td>Saturday February 11</td>
<td>Storm make-up day, if needed (classes will be made-up online).</td>
</tr>
<tr>
<td>Thursday February 16</td>
<td>Mid-term Test 1.</td>
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<tr>
<td>March 5–11</td>
<td>Spring Break—no classes.</td>
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<tr>
<td>Friday March 24</td>
<td>Last day to withdraw with a grade of “W”.</td>
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<tr>
<td>Thursday March 30</td>
<td>Mid-term Test 2.</td>
</tr>
<tr>
<td>Wednesday April 26</td>
<td>Last day of classes.</td>
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<tr>
<td>Thursday April 27</td>
<td>Reading Day.</td>
</tr>
<tr>
<td>Tuesday May 2, 8 to 10 am</td>
<td>Final Exam.</td>
</tr>
<tr>
<td>Tuesday May 9</td>
<td>Grades available on MyPortal.</td>
</tr>
</tbody>
</table>

\(^1\)deanofstudents.cofc.edu/honor-system/
\(^2\)deanofstudents.cofc.edu/honor-system/studenthandbook/