MATH 116.09
Business Calculus
Fall 2021
Fully Online Asynchronous Class

Instructor: Kathryn Pedings-Behling (primary) & Amy Langville
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Office Hours: virtual via Zoom (by appointment)

COURSE INFORMATION

Course Description: Calculus for the Business and Social Sciences is a required course for many majors at the College of Charleston. In Math 116, you learn concepts such as derivative, limit, global extrema, and integrals, all of which enable the solution of some very interesting problems. For example, what is the most dangerous part of a racetrack? Given a rectangular piece of cloth, what are the dimensions of the octagon of maximal area?

This material is covered in an active learning journal that we wrote specifically for this particular learning environment: *Deconstruct this Business Calculus Journal: derivatives & integrals with business applications.*

Amy Langville and Kathryn Pedings-Behling developed this course and course materials together. You will see videos and content from each of them, but your primary instructor for this course is Kathryn. She will grade all assignments and be your contact for support.

This class is taught with 100% asynchronous delivery. You will access materials on your own time. A new module with material and assignments will be released every week on Sunday at 12:01 AM ET. Assignments will always be due on Sundays at 11:59 pm ET. There will be several group assignments that you must complete with classmates, either synchronously or asynchronously. Many more details follow, but in general, plan to spend 6-9 hours per week on this class.

Course Credit: 3
Prerequisites: MATH 101 College Algebra or placement

STUDENT LEARNING OUTCOMES

Student Learning Outcomes from the CofC Mathematics Program

This course can be used to satisfy requirements of the undergraduate mathematics program, for which there are several broad 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:

- model phenomena in mathematical terms;
- solve problems by applying these models and establishing conclusions;
- demonstrate an understanding of the supporting theory behind the models apart from any particular application.

These will be assessed with several assignments and a final exam.

Content-specific Student Learning Outcomes for this MATH 116 course

Then there are some outcomes that are specific to this class. You will be able to:

Explain and define fundamental concepts of differential and integral calculus.

Work in groups efficiently and effectively. We will break into small groups when possible. You can learn a great deal by engaging with classmates around a key concept or problem.

Use the solid mathematical foundation developed in MATH 116 for success in later major courses.

These will be assessed with weekly quizzes, calculation problems, activities, group challenge problems, and a final exam, all of which are described later.

My General Course Objectives: In addition to the above learning outcomes, I also have several additional goals for each of you. I have designed materials and assignments so that you will:

- appreciate "meta-mathematics" by understanding how your definition of mathematics affects how you do it, and hopefully broaden your definition of what mathematics is and how various people do it;
- improve your scientific communication skills, both written and oral;
- improve your teamwork;
- improve your problem-solving skills.

These will be assessed with group challenge problems and discussion forums.

COURSE REQUIREMENTS

Course Text: There is no e-text, only a hard copy because the text is designed for you to physically interact with, e.g., by folding pages to visualize functions and flipping pages to animate motion. Visit the CofC Bookstore to get your copy of the journal below or contact the bookstore to have one mailed to you. In order to keep the cost of course materials low for you, this journal is produced and provided at cost to you. (The College and I do not make one cent from them. You merely pay what it costs the Copy Center to produce them.)

1. Amy N. Langville & Kathryn E. Pedings-Behling. *Deconstruct this Business Calculus Journal: derivatives & integrals with business applications*. Fall 2021 edition. College of Charleston Copy Center, Charleston, SC.

Hardware:

1. Computer with high speed internet access, sound card, microphone and external speakers or headphones.
2. Scanner for ability to take photos and upload or email with a computer or smartphone. A great app for converting smartphone pictures to pdf files is Camscanner.

Software:

1. Consistent and reliable access to high speed internet.
2. Adobe Acrobat Reader to view assigned readings.
3. Web browser to access OAKS and free tech tools like Symbolab and WolframAlpha.
4. Word processing software to construct written assignments.
5. Zoom to record individual and group video assignments.

Calculator: not required, but you may use one if you like. Your *Deconstruct journal* will teach you how to use several powerful and free online tech tools, such as Wolfram Alpha and Symbolab.

Netiquette Guidelines: Even though this class is an online course, we will still do a good bit of teamwork in this class. As a result, it is important to follow common netiquette standards when communicating with your teammates in discussion boards, group projects, and emails or text messages.

- Before posting your question to a discussion board, check if anyone has already asked it and received a reply.
- Stay on topic. Don't post irrelevant links, comments, thoughts or pictures.
- Don't type in ALL CAPS; it looks like you're screaming.
- Don't write anything that sounds angry or sarcastic even as a joke, because without hearing your tone of voice, your peers might not realize you're joking.
- Always remember to say "please" and "thank you" when soliciting help from your classmates.
- Respect the opinion of your classmates. If you feel the need to disagree, do so respectfully and acknowledge the valid points in your classmate's argument. If you reply to a question from a classmate, make sure your answer is accurate.
- Before asking a question, check the class FAQs or search the Internet to see if the answer is obvious or easy to find.
- Be forgiving. We all make mistakes from time to time.
- Run a spelling and grammar check before posting anything to the discussion board.

How to Get Help: Do not make the mistake of thinking that because this is an online class, it's going to be easier than taking it in person. After all, this is Calculus. This course is rigorous and will require self-discipline on your part to ensure your success. If you have questions about assignments or the course content, it is imperative that you reach out for help. Please use the following process for getting help:

1. Consult the class schedule and syllabus as you may find your answer there.
2. Check OAKS for announcements and instructions, including discussion boards.
3. Confer with classmates, particularly teammates.
4. The College of Charleston Math Lab is within the Center for Student Learning, which is located on the first floor of Addlestone Library (Room 116), and has a walk-in tutoring center. They also have virtual office hours. Make an appointment at https://csl.cofc.edu/labs/math-lab/index.php
5. If you still don't know the answer to your question, contact me through email or OAKS. All correspondence will be answered within 48 hours so plan accordingly. We can set up a time for office hours if needed.
6. In general, ask yourself this: Is the content of my question personal or confidential? If so, contact me. On the other hand, if the content of your question is public and something that you would have asked in a face-to-face class, then this question belongs in a public space, like a discussion board since its answer could benefit your classmates too and could be answered by anyone, student or instructor.

Discussion Boards in OAKS: We will have two types of discussion boards: a Q&A board and a module-specific board. For the module-specific board, I may start the discussion with a prompt that is either about the content or about meta-mathematics. These prompts will help us get to know each other, how we think about math, how we each do math, what we like and dislike about math, etc. Though we don't meet face-to-face, I want to get to know each of you and I want you to know each other. Connectedness and community are key to success, particularly with the group challenge problems. You will learn essential teamwork and communication skills that will apply beyond this class. I will facilitate these discussions; you are the drivers.

Zoom: We will use Zoom in this class in several ways. I will record videos with Zoom and I will hold virtual office hours in Zoom because it not only allows for synchronous face-to-face interactions, but also provides an online "whiteboard" where we can work on problems together synchronously. In addition, you will periodically submit Zoom team videos demonstrating your solution to Challenge problems. Help with Zoom:
http://blogs.cofc.edu/sits/zoom-video-resources/

Email/Text Messages: We will use a buddy system in this class. You must submit challenge problems as a group but you are invited to contact your teammates beyond that for other individual assignments, checking in by email or text. For example, you might email your buddy something like "done with activity 9, took about 10 minutes, pretty straightforward" or "having trouble with tech tool for graphing f(x) for problem 6. Have you done it yet?"

Technical Issues: Resolve technical problems promptly. *Computer failure/unavailability does not constitute an excuse for not completing assignments by the due date.*

- Resource for students taking distance education classes: The College of Charleston has put together a helpful guide for students enrolled in a distance education course. Check it out: http://blogs.cofc.edu/studentreadinessforonlinelearning
- https://blogs.cofc.edu/sits/2020/06/16/tips-on-how-to-be-successful-in-online-learning/
- OAKS tutorials: https://blogs.cofc.edu/sits/2020/06/20/introduction-to-oaks-for-students/
- College of Charleston HelpDesk (843-953-3375) can help with MyCharleston, OAKS, and CofC email accounts.
- Zoom tutorials: http://blogs.cofc.edu/sits/zoom-video-resources/
  Technology information and tutorials on many topics are available at: https://continuity.cofc.edu/learning-remotely/index.php and https://blogs.cofc.edu/sits/
- You may also contact the Information Desk at the Addlestone Library (in person, by phone, email or chat), which is manned by Library and Student Computing Support staff. For example, click on the "Ask Us" tab on the library homepage https://library.cofc.edu/

Attendance: The great advantage of taking classes online is flexibility to take class from anywhere and any time. That advantage, however, requires great responsibility. The impetus for completing assignments on time is on you.

Late Submissions: *Late submissions will not be accepted, so plan ahead.* Waiting until the last minute to prepare an assignment is not wise. You may lose power, have problems with your computer, or an emergency may arise.

CLASS POLICIES

- The College of Charleston Student Handbook is a guide to your responsibilities and rights as a student.

- **Academic Honesty:** Faculty members are required to report violations of the honor code to the Office of Student Affairs. If you are found guilty, your grade in the class will be XXF and this will be indicated on your transcript. Examples of cheating include giving or receiving aid during an individual graded activity, using any type of "cheat sheet", copying from or looking at another person's graded activity, or submitting another person's work as your own. Students may find a complete version of the Honor Code and all related processes in the Student Handbook.

- **Disability:** In compliance with the Americans with Disabilities ACT (ADA), all qualified students enrolled in this course are entitled to "reasonable accommodations." Students should apply at the Center for Disability Services, also known as the SNAP Center (843-953-1431), located on the first floor of the Lightsey Center. Please notify me during the first week of the course of accommodations that you need.

- **Pronoun Usage:** Let me know your preferred name and gender pronoun. Mine is she/her.

- **Email Usage:** I am only allowed to communicate about this course through your College of Charleston email address

- **Recording of Classes:** Any Zoom sessions may be recorded via both voice and video recording. By attending and remaining in this class, the student consents to being recorded. Recorded class sessions are for instructional use only and may not be shared with anyone who is not enrolled in the class.

- **Interruption of Instruction:** If in-person classes are suspended, faculty will announce to their students a detailed plan for a change in modality to ensure the continuity of learning. All students must have access to a computer equipped with a web camera, microphone, and Internet access. Resources are available to provide students with these essential tools.

- **Attendance Verification:** Only students officially registered (graded or auditing) for this course may attend class. During the week following the drop/add deadline, the professor will verify student enrollments in this course. Any student appearing on the class roll but determined not to have attended the class even once will be removed.

- **Mental & Physical Wellbeing:** At the college, we take every students' mental and physical wellbeing seriously. If you find yourself experiencing physical illnesses, please reach out to student health services (843.953.5520). And if you find yourself experiencing any mental health challenges (for example, anxiety, depression, stressful life events, sleep deprivation, and/or loneliness/homesickness) please consider contacting either the Counseling Center (professional counselors at http://counseling.cofc.edu or 843.953.5640 3rd Robert Scott Small Building) or the Students 4 Support (certified volunteers through texting "4support" to 839863, visit http://counseling.cofc.edu/cct/index.php, or meet with them in person 3rd Floor Stern Center). These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.

- **Food & Housing Resources:** Many CofC students report experiencing food and housing insecurity. If you are facing challenges in securing food (such as not being able to afford groceries or get sufficient food to eat every day) and housing (such as lacking a safe and stable place to live), please contact the Dean of Students for support. Also, you can go to http://studentaffairs.cofc.edu/student-food-housing-insecurity/index.php to learn about food and housing assistance that is available to you. In addition, there are several resources on and off campus to help. You can visit the Cougar Pantry in the Stern Center (2nd floor), a student-run food pantry that provides dry-goods and hygiene products at no charge to any student in need., so please email me from your college account.

KEYS TO SUCCESS

To succeed in this class, I recommend the following.

1. Log into our OAKS class at least 4 times a week to be sure you are working with the material in manageable amounts, staying informed of announcements, and participating adequately.
2. Spend 6-9 hours a week on class.
3. Work with teammates. Most students say this is not only the most rewarding and fun part of class, but also the most efficient way to learn the concepts.
4. Interact with your journal. This is designed for active learning so when the journal asks (in gray font) for you to do something like make a paper airplane, draw on your hand, or fold the page, do it. When you do, I promise that you will understand and remember the key concept.

ASSESSMENT & GRADING

Grading Criteria and Scale: I will calculate your grade using the University Plus/Minus grading scale (A, A-, B+, etc.). A grade for every assignment will be posted in the gradebook feature of OAKS so that you can track your progress over the course of the semester. Please contact me if you feel there is an error with the gradebook.

Grading Scale*:

A	93 - 100	B-	80 - 81	D+	65 - 69
A-	90 - 92	C+	75 - 79	D	62 - 64
B+	85 - 89	C	72 - 74	D-	60 - 61
B	82 - 84	C-	70 - 71	F	Below 60

**All final grades will be rounded.*
Ex: 89.3→89 (B+) or 89.7→90 (A-)

Course Overview: Specific instructions for each assignment will be posted under the content section within OAKS. Course material will be organized into 8 modules, released every week at 12:01AM ET on Sunday. Every week assignments will be due on Sundays at 11:59pm ET. A typical module typically consists of readings in your journal, 1-2 quizzes, some activities from your journal, some calculation work from your journal, participation opportunities in discussions, and a group challenge problem.

General Descriptions of Course Assignments: many more details are included with each assignment as we proceed through the course materials in OAKS.

Final Exam 20%: There will be a cumulative proctored final exam in OAKS during the final exam schedule. The exam will consist of a variety of types of questions including but not limited to true/false, matching, multiple choice, fill in the blank, and short answer. At the end of the final, you must also upload your work for each question in order to receive credit. You may not use any resources, other than those indicated, or work with other students when completing your online final exam.

Midterm 15%: There will be a proctored midterm exam in OAKS. The exam will consist of a variety of types of questions including but not limited to true/false, matching, multiple choice, fill in the blank, and short answer. At the end of the midterm, you must also upload your work for each question in order to receive credit. You may not use any resources, other than those indicated, or work with other students when completing your online midterm.

Quizzes 15%: There is a large amount of material presented in this class and preparation is key. If you're not prepared, you will struggle to keep up. There will be 1 or 2 quizzes for each content module. Each quiz is related to the assigned readings in the journal and will be due by 11:59pm EST in accordance with the course schedule. There will be no makeup quizzes offered. Quizzes are open note, open journal, open tech tool but you may not use any resources, other than those indicated, or work with other students when completing your online quiz. You will have a limited time to complete your quiz so pay attention to the posted timer. The quiz will auto-submit when the quiz time runs out. *Your two lowest quiz grades for the semester will be dropped.* To practice, during our first orientation week, there will be a quiz on the information covered in this syllabus. You have an unlimited number of attempts and must earn a 100% before accessing the subsequent modules in OAKS.

Coursework 20%: This category is a catchall for many things we will do in this course. *Your four lowest coursework grades for the semester will be dropped.*

- Orientation Assignments: The orientation assignments have two purposes: (1) to familiarize you with the course learning tools and (2) to get to know each other, building community and teams. With these assignments, you will practice submitting journal pages, making a team video in zoom, and using discussion boards.
- Activities: Several pages in each chapter are activity pages, where you will construct or deconstruct a formula or object, like a Riemann sum, to understand a key concept in Calculus. For each module, several such activity pages will be assigned for submission in an OAKS dropbox.
- Calculation Practice: Each chapter contains several calculation pages, where you practice fundamental calculations, such derivatives, with specific functions. For each module, several such calculation pages will be assigned for submission in an OAKS dropbox.
- Discussions: Regular and active participation is an essential part of this class. There will be a few discussion assignments for this course. Typically to earn credit you must make your post to my discussion prompt and respond to at least one classmate's post.

Group Challenge Problems 30%: Note that these are the only group assignments in the class and one will be due about every two weeks. Each journal chapter contains a few challenge problems at the end. You must choose one to submit with your team. Instructions will be provided with each challenge assignment on the format for submission. Some will require an oral communication of your team's work and others, a written communication. For each challenge submission, a contribution section must be included that details the contributions of each team member.

COURSE SCHEDULE

Unit/Assessment	Date Opened	Due by 11:59 PM (EDT)
Orientation	8/24/21	8/27/21
Unit 1: Week 1	8/24/21	8/29/21
Unit 1: Week 2	8/29/21	9/5/21
Unit 2: Week 1	9/5/21	9/12/21
Unit 2: Week 2	9/12/21	9/19/21
Unit 2: Week 3	9/19/21	9/26/21
Unit 3: Week 1	9/26/21	10/3/21
Midterm Prep	10/3/21	10/10/21
Midterm Exam	**Testing Window: 10/8/21 - 10/10/21**	
Unit 4: Week 1	10/10/21	10/17/21
Unit 4: Week 2	10/17/21	10/24/21
Unit 5: Week 1	10/24/21	10/31/21
Unit 6: Week 1	10/31/21	11/7/21
Unit 6: Week 2	11/7/21	11/14/21
Unit 6 Week 3	11/14/21	11/21/21
Final Exam Prep	11/29/21	12/6/21
Final Exam	**Exam Window: 12/8/21-12/10/21**	

Important Dates:

- 8/24/21 - First Day of Classes
- 8/30/21 - Drop/Add Deadline
- 10/18/21 & 10/19/21 - Fall Break
- 10/29/21 - Withdrawal Deadline
- 11/24 - 11/28/21 - Thanksgiving Break
- 12/6/21 - Last Day of Class
- 12/15/21 - Final Grades Due

ABOUT AMY

I'm Amy, one of your instructors for this Calculus class. I've been teaching calculus every semester, multiple times a semester, for over 20 years. That's a lot of calculus. My goal is to make this subject come alive in a fun, participatory manner. And I also hope to deepen your appreciation for mathematics in general and how you do it.

When I'm not teaching calculus or graduate classes in optimization, I'm doing research on ranking and clustering. Years ago I started studying the mathematics of how search engines, like the Addlestone library search engine and Google, work. I wrote a book, *Google's PageRank and Beyond: The Science of Search Engine Rankings*. This led to research on general ranking methods. I wondered: how does the US News and World Report rank colleges? How are teams seeded for the March Madness tournament? How are Olympic athletes ranked to receive funding from the USOC? I wrote another book, *Who's #1: The Science of Rating and Ranking*.

And when I'm not teaching or doing research, I'm surfing. Or more specifically, whenever there's a rideable wave on Folly or around the world, I'm surfing it. In fact, for my last sabbatical year my husband and I packed boards and two dogs into a van that we lived in. We traveled up and down the East and West coasts of the U.S. and Canada, moving from one surf break to the next, doing math and hiking when the surf was flat.

ABOUT KATHRYN

My name is Kathryn, and I will be your primary instructor for the course. I have been in the field of math education since 2008, and I'm thrilled to take this journey with all of you. I enjoy learning and growing as an educator. I have been a high school math teacher (I taught every course available for HS Math), curriculum writer, summer camp coordinator, and now, adjunct instructor. Just like you, I was once a Cougar! I got both my BS and MS from CofC, and, fun fact, Amy was the most influential professor I had in my time here! Do you know how lucky you are to have us tag-teaming on this course?!? We are the dream team.

I have 3 kiddos - 5-year-old twins Carson & Violet and 1-year-old Abigail. Like Amy, we also love to travel (but we sleep in hotels - boring)! Some of my favorite trips have been the Grand Canyon, Australia, Japan, Switzerland, and driving up the 101 in a convertible! Pictured is me at Platform 9 ¾ in King's Cross Station in London. I'm excited to learn with you this semester!