Math 221: Calculus III

Spring 2023 Course Syllabus
Section 02: 10-10:50 MWF in Maybank Hall (MYBK) 108
10:50-12:05 Th in Maybank Hall (MYBK) 108

This syllabus covers course information and the expectations of the students throughout the course. I will notify students of any changes.

Professor: Daniel Poll
Email: polldb@cofc.edu
Office: RSS 345
Office Hours: Drop-in (see schedule on OAKS)

Course Description: This course is an introduction to multivariable calculus. We will cover the calculus of geometry and motion in two and three dimensional space, continuity and differentiability of functions of several variables, multivariable optimization, line integrals and multiple integrals, the theorems of Green and Stokes, and the Divergence Theorem.

Prerequisite: MATH 220 or its equivalent

Text: (Required) *Calculus: Early Transcendentals*, 8th Edition by James Stuart (search by ISBN: 978-1285741550). Available at the CofC bookstore or online. Other versions that cover fewer chapters may also be available online. The online software WebAssign is **not** required for this course. Feel free to find the book wherever you please.

Software: (Recommended) One useful method for verifying your work is to numerically solve or simulate problems. This is by no means required, but it is generally a good idea to have some coding experience when working in STEM. CofC offers MATLAB free to students with instructions to download here:

`https://it.cofc.edu/computing/software/matlab/index.php`

Some demonstrations of ideas, graphs, etc. may be done in MATLAB. The code will also be provided to students if they would like to look at it themselves. However, coding is not a required part of the class and will not impact your grade.

Calculators: Calculators will **not** be allowed on exams. The exam questions will be written such that a calculator is not necessary. Students may use a calculator when solving their assignment problems. However, students should take care to use this as a study aid. Assignments without sufficient explanation will not receive credit.

Learning Outcomes: By the end of the course, students will be able to:

1. Identify, sketch and parameterize surfaces and space curves. Identify and plot vector fields. Additionally, students will be able to algebraically manipulate vectors using the dot product, scalar product and cross product to answer geometric questions.

2. Apply differentiation and integration techniques to parameterize curves so that students can draw conclusions about the geometry of the curve or about the trajectory of a particle.

3. Compute, interpret, and apply various kinds of derivatives of multi-variable functions (whether scalar functions or vector functions), typically in application to multivariate optimization problems, both constrained and unconstrained.

4. Setup and evaluate integrals over two or three dimensional regions, using various coordinate systems, various orders of integration, and the ability to convert between these coordinate systems. Additionally, students should be able to transform integrals by applying Stokes' or Divergence Theorem.

Mathematics Program Student Learning Outcomes: By the end of the course, students will be able to

1. use algebra, geometry, calculus and other track-appropriate sub-disciplines of mathematics to model phenomena in mathematical terms;

2. use algebra, geometry, calculus and other track-appropriate sub-disciplines of mathematics to derive correct answers to challenging questions by applying the models from the previous Learning Outcome; and

3. write complete, grammatically and logically correct arguments to prove their conclusions.

These outcomes will be assessed on the final exam.

Resources: Academic support can be found at the Center for Student Learning (CSL). Services include tutoring, supplemental instruction, study skills appointments, and workshops. For more information, visit:

`https://csl.cofc.edu`

However, because this course is considered advanced, you may not always find tutoring resources. In this case, I encourage you to contact me directly (polldb@cofc.edu) or drop-by office hours.

Additional resources such as notes, practice exams, and other helpful links will be posted on the course homepage on OAKS. Students can access OAKS here:

`https://lms.cofc.edu`

Grade Distribution: Students will be evaluated using the criteria given below.

Homework:	30 %
Projects:	10 %
Exams:	45 %
Final:	15 %
Total:	100 %

Your grade is determined by a combination of weekly homework assignments, two projects, your highest three exam grades (excluding the final), and the final exam. Letter grades will be assigned using the following scale:

Letter grade:	A	A-	B+	B	B-	C+	C	C-	D+	D	D-
Minimum score:	90%	87%	83%	80%	77%	73%	70%	67%	63%	60%	57%

Lecture: The class will meet in-person. While attendance is not evaluated, it's essential that students maintain an active presence in the class including attending lectures. It is in your best interest to attend whenever possible. If you are having difficulty attending lecture, please reach out to me. In situations where you cannot attend, such as COVID quarantine, I will attempt to accommodate with a Zoom room. However, the quality is not guaranteed.

Homework: Homework will be assigned approximately once a week. These will be uploaded to OAKS and announced in-class. The questions will be a selection of problems from the textbook and questions written by the professor. Full explanations of the student's work is required when submitting written work.

Due to the volume of grading, the homework will be assessed by a random sampling of the assigned problems. For example, if 10 problems are assigned, I may choose 4 of those 10 to grade. As a result, it's imperative students complete the entire assignment. Questions with answers left blank or without any justification will receive a zero. Additionally, while collaboration is encouraged, your work should ultimately be your own. Plagiarism is taken seriously. Please keep this in mind when submitting your work for evaluation.

Projects: A selection of a few projects that dive a bit further into the material will be posted during the semester. Students are required to choose two projects for assessment based on addressing the questions asked, independent exploration of the topic, and formatting of their submitted work. A full rubric for projects will be posted on OAKS.

Exams: There will be a total for four exams excluding the final. Out of these, I will drop the lowest score out of the four exams at the end of the semester. If you miss an exam, **that exam will count as your dropped exam**. There are no make-up exams. The final exam is the only exam which will have cumulative coverage of topics. Exam dates are as follows:

Exam 1	Wednesday, February 8	Exam 3	Wednesday, March 29
Exam 2	Wednesday, March 1	Exam 4	Wednesday, April 19

Each exam will be given during class time with the exception of the final. **The final is on Monday, May 1 from 10:30-12:30 pm**. Exams will typically be graded within a few days. However, in some cases, it may take up to one week to return grades.

Absences: If you're absent during lecture, no reason is needed. Read the relevant sections, grab notes from a friend, and bring any questions to me or your peers. If you miss an exam, this will count as your dropped exam. If you miss more than one, you should contact me (polldb@cofc.edu) as soon as possible.

Attendance Verification: College of Charleston policy requires me to take roll during the first two weeks after drop/add, until I determine that all of my students have attended at least once, and report the results to the College. Any student who has not attended class at least once during these two weeks will be dropped from this class by the registrar. These roll calls will not be used in the calculation of the remaining students' grades at the end of the semester.

Student Support: Student Support: 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 please consider contacting either the Counseling Center (https://counseling.cofc.edu) or Students 4 Support. These services are there for you to help you cope with difficulties you may be experiencing and to maintain optimal physical and mental health.

Student Accommodations: The College will make reasonable accommodations for persons with documented disabilities. Students should apply for services at the Center for Disability Services/SNAP located on the first floor of the Lightsey Center, Suite 104. Students approved for accommodations are responsible for notifying me as soon as possible and for contacting me one week before accommodation is needed.

Basic Standards of Academic Integrity:
Registration at the College of Charleston requires adherence to the university's standards of academic integrity. These standards may be intuitively understood, and cannot in any case be listed exhaustively. The following examples represent some basic types of behavior that are unacceptable:

1. Cheating: using unauthorized notes, study aids, or information on an examination; altering a graded work after it has been returned, then submitting the work for regrading; **allowing another person to do one's work and submitting that work under one's own name**; submitting identical or similar papers for credit in more than one course without prior permission from the course instructors.

2. Plagiarism: submitting material that in part or whole is not entirely one's own work without attributing those same portions to their correct source.

The full offical policy for academic integrity can be found at:

`http://deanofstudents.cofc.edu/honor-system/studenthandbook/`