MA 242: Calculus III

Syllabus for Section 651, Summer 2021, 4 credits

Welcome to Calc 3! The subject of this course is “multivariable calculus”. In earlier calculus courses you’ve taken, you have studied *functions* with an input x and output $f(x)$ like $f(x) = x^2$. Multivariable calculus investigates functions with several inputs like $g(x, y) = x^2 + y^3$ and applies the main ideas of calculus (*differentiation* and *integration*) play out in this setting. Along the way, we will learn to use three-dimensional geometry to help us understand these functions and vice versa. Simply put, multivariable calculus is calculus in 3-D!

Teaching Staff

Instructor of Record: Jessica Notestine -- jginepr@ncsu.edu
Office Hours -- by appointment

Learning Outcomes

After taking this course, you will be able to apply the ideas of differential and integral calculus to multivariable functions, vector-valued functions, and vector fields, e.g. to find volumes and surface area, to answer multivariable optimization problems, and to calculate physical quantities like velocity, work, flux, and potential. You will learn how to work with, describe, and analyze geometric figures in three dimensions with the tools of calculus. You will see generalizations of the fundamental theorem of calculus to multivariable settings.

Course Structure

Lecture videos: The lecture component of this course will take place via a series of videos created by Dr. Bevin Maultsby. The videos are posted to the Moodle site and contain questions designed to help you actively participate in the learning process. These questions are meant to be practice only and do not count toward your grade. You are expected to watch the videos before working on the corresponding homework assignments, and you can rewatch them at any time.

Recitation: In addition to the lecture videos, we will have a weekly recitation on Tuesdays, time TBD. This session will provide extra practice problems and answer questions about the topics covered in lecture. The zoom sessions will be recorded and posted to moodle for those that cannot attend the live session.

WebAssign Homework: You will have online homework assignments through WebAssign due throughout the semester. Please see the Moodle site for instructions on getting access to

WebAssign. The approximate cost for access is $77.50 and includes access to the textbook through the WebAssign portal. I will automatically drop your three lowest WebAssign homework assignments. WebAssign will also allow you to take a five-day extension for 90% credit (a 10% penalty).

Exams: We will have three exams throughout the semester, which will be taken remotely. Details will be posted closer to that time.

Final Exam: The course will have a final exam, which you will take remotely. Details will be posted closer to that time.

Grading Policy

Your grade for the course will be calculated as:

30% WebAssign + 55% Exam + 15% Final Exam

I will use NC State's standard letter grading:

97≤**A+**≤100	93≤**A**<97	90≤**A-**<93
87≤**B+**<90	83≤**B**<87	80≤**B-**<83
77≤**C+**<80	73≤**C**<77	70≤**C-**<73
67≤**D+**<70	63≤**D**<67	60≤**D-**<63
	0≤**F**<60	

Policies for Late or Missed Work

If you fall behind in the course for whatever reason, you should reach out to me. In general, late assignments will not be accepted.

Your lowest three WebAssign assignments and your lowest Quiz grades are automatically dropped from your grade. These drops are meant to be used for short-term illnesses or extenuating circumstances that may cause you to miss or underperform on a particular assignment or quiz. As stated above, you can also turn in WebAssign problem sets up to five days late for 90% credit (a 10% penalty).

For longer-term, recurring, or more serious illness or other interruptions to your participation in this class, you should reach out to me as soon as you can, and arrangements will be made to help you get caught up.

Extra Help

Your peers: It is encouraged and expected for you to work together with your classmates on homework assignments and studying, either remotely or in person.

Piazza: On Moodle, you will find a link to the Piazza page for this course. This allows you to ask and answer questions that you have about the homework/material. The teaching staff will also monitor discussions, providing help with questions, and “certifying” correct responses. Note that your posts will be anonymous to your classmates, but instructors will see your identity.

Office hours: Office hours will be held via Zoom. You can find the Zoom link on the Moodle page, along with any updates or changes. You can ask questions about the homework, or general questions about course material. You must select an appointment at at least 24 hours prior to the start time.

Academic Integrity

On WebAssign and written homework, you are encouraged to work together with your peers and seek help from the teaching staff, textbook, and other resources as needed. However, you should make sure you understand the solutions you submit.

On Exams and the Final Exam, you may **not** work with anyone else nor seek outside help--collaboration is strictly prohibited unless otherwise specified. Each assessment will have instructions outlining exactly what resources or electronic aides you are permitted to use.

Posting course materials to websites like Chegg and Course Hero is a violation of copyright law and course policy and is strictly prohibited. Violations of this policy will be reported to the Office of Student Conduct.

You are expected to abide by the Code of Student Conduct (NCSU POL11.35.01) and Pack Pledge. Violations of academic integrity will be handled in accordance with the Student Discipline Procedures (NCSU REG 11.35.02). Your signature on any test or assignment indicates "I have neither given nor received unauthorized aid on this test or assignment."

Course Schedule

The following rough schedule is tentative and subject to change.

5/19-5/21	Unit 1
5/24-5/28	Unit 1 & 2
6/1-6/4	Unit 2
6/7-6/11	Unit 2 & 3
6/14-6/17	Unit 3
6/21-6/25	Unit 3 & 4
6/28-7/2	Unit 4 & 5
7/6-7/9	Unit 5 & 6
7/12-7/16	Unit 6
7/19-7/23	Unit 6 & 7
7/26-7/30	Unit 7

For a day-by-day schedule, please see the schedule posted on Moodle.

Additional Information

Course catalog description: Third of three semesters in a calculus sequence for science and engineering majors. Vectors, vector algebra, and vector functions. Functions of several variables, partial derivatives, gradients, directional derivatives, maxima and minima. Multiple integration. Line and surface integrals, Green's Theorem, Divergence Theorems, Stokes' Theorem, and applications. Use of computational tools. Prerequisite: MA 241 with grade of C- or better or AP Calculus credit, or Higher Level IB credit.

Requirements for Credit-Only (S/U) Grading: In order to receive a grade of S, students are required to take all exams and quizzes, complete all assignments, and earn a grade of C- or better. Conversion from letter grading to credit only (S/U) grading is subject to university deadlines. Refer to the Registration and Records calendar for deadlines related to grading. For more details refer to http://policies.ncsu.edu/regulation/reg-02-20-15.

Requirements for Auditors (AU): Information about and requirements for auditing a course can be found at http://policies.ncsu.edu/regulation/reg-02-20-04.

Policies on Incomplete Grades: If an extended deadline is not authorized by the instructor or department, an unfinished incomplete grade will automatically change to an F after either (a) the end of the next regular semester in which the student is enrolled (not including summer sessions), or (b) the end of 12 months if the student is not enrolled, whichever is shorter. Incompletes that change to F will count as an attempted course on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student. The university policy on incomplete grades is located at http://policies.ncsu.edu/regulation/reg-02-50-3.

Attendance Policy: For complete attendance and excused absence policies, please see http://policies.ncsu.edu/regulation/reg-02-20-03

Digital Course Components: Students may be required to disclose personally identifiable information to other students in the course, via digital tools, such as email or web-postings, where relevant to the course. Examples include online discussions of class topics, and posting of student coursework. All students are expected to respect the privacy of each other by not sharing or using such information outside the course. The following digital components will be used: Zoom, Moodle, Piazza, Gradescope.

Accommodations for Disabilities: Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Resource Office at Holmes Hall, Suite 304, Campus Box 7509, 919-515-7653. For more information on NC State's policy on working with students with disabilities, please see the Academic Accommodations for Students with Disabilities Regulation (REG02.20.01) (https://policies.ncsu.edu/regulation/reg-02-20-01/).

Non-discrimination Policy: NC State provides equal opportunity and affirmative action efforts, and prohibits all forms of unlawful discrimination, harassment, and retaliation ("Prohibited Conduct") that are based upon a person's race, color, religion, sex (including pregnancy), national origin, age (40 or older), disability, gender identity, genetic information, sexual orientation, or veteran status (individually and collectively, "Protected Status"). Additional information as to each Protected Status is included in NCSU REG 04.25.02 (Discrimination, Harassment and Retaliation Complaint Procedure). NC State's policies and regulations covering discrimination, harassment, and retaliation may be accessed at http://policies.ncsu.edu/policy/pol-04-25-05 or https://oied.ncsu.edu/divweb/. Any person who feels that he or she has been the subject of prohibited discrimination, harassment, or retaliation should contact the Office for Equal Opportunity (OEO) at 919-515-3148.

Additional NC State Rules and Regulations: Students are responsible for reviewing the NC State University Policies, Rules, and Regulations (PRRs) which pertain to their course rights and responsibilities, including those referenced both below and above in this syllabus:

- Equal Opportunity and Non-Discrimination Policy Statement https://policies.ncsu.edu/policy/pol-04-25-05 with additional references at https://oied.ncsu.edu/divweb/policies/
- Code of Student Conduct https://policies.ncsu.edu/policy/pol-11-35-01.

COVID Addendum

Due to the Coronavirus pandemic, public health measures have been implemented across campus. Students should stay current with these practices and expectations through the Protect the Pack website (https://www.ncsu.edu/coronavirus/). The sections below provide expectations and conduct related to COVID-19 issues.

Health and Participation in Class

We are most concerned about your health and the health of your classmates and instructors/TAs.

- If you test positive for COVID-19, or are told by a healthcare provider that you are presumed positive for the virus, please work with your instructor on health accommodations and follow other university guidelines, including self reporting (Coronavirus Self Reporting): Self-reporting is not only to help provide support to you, but also to assist in contact tracing for containing the spread of the virus.
- If you feel unwell, even if you have not been knowingly exposed to COVID-19, please do not come to class.
- If you are in quarantine, have been notified that you may have been exposed to COVID-19, or have a personal or family situation related to COVID-19 that prevents you from attending this course in person (or synchronously), please connect with your instructor to discuss the situation and make alternative plans, as necessary.
- If you need to make a request for an academic consideration related to COVID-19, such as a discussion about possible options for remote learning, please talk with your instructor for the appropriate process to make a COVID-19 request (a university-level form can be found here).

Health and Well-Being Resources

These are difficult times, and academic and personal stress are natural results. Everyone is encouraged to take care of themselves and their peers. If you need additional support, there are many resources on campus to help you:

- Counseling Center (NCSU Counseling Center)
- Health Center (Health Services | Student)
- If the personal behavior of a classmate concerns or worries you, either for the classmate's well-being or yours, we encourage you to report this behavior to the NC State CARES team: (Share a Concern).
- If you or someone you know are experiencing food, housing or financial insecurity, please see the Pack Essentials Program (Pack Essentials).

Community Standards related to COVID-19

We are all responsible for protecting ourselves and our community. Please see the community standards (released on 7/28/2020) and Rule 04.21.01 regarding Personal Safety Requirements Related to COVID-19 RUL 04.21.01 – Personal Safety Requirements Related to COVID-19 – Policies, Regulations & Rules.

Course Expectations Related to COVID-19:

- **Face Coverings:** All members of the NC State academic community are required to follow all university guidelines for personal safety with face coverings, physical distancing, and sanitation. Face coverings are required in class and in all NC State buildings. Face coverings should be worn to cover the nose and mouth and be close fitting to the face with minimal gaps on the sides. In addition, students are responsible for keeping their course/work area clean. Please follow the cleaning guidelines described by the university.
- **Course Attendance**: NC State attendance policies can be found at: REG 02.20.03 – Attendance Regulations – Policies, Regulations & Rules . Please refer to the course's attendance, absence, and deadline policies for additional details. If you are quarantined or otherwise need to miss class because you have been advised that you may have been exposed to COVID-19, you should not be penalized regarding attendance or class participation. However, you will be expected to develop a plan to keep up with your coursework during any such absences. If you become ill with COVID-19, you should follow the steps outlined in the health and participation section above. COVID 19-related absences will be considered excused; documentation need only involve communication with your instructor.
- **Course Meeting Schedule**: Your course might not have a traditional meeting schedule in Fall 2020. Be sure to pay attention to any updates to the course schedule as the information in this syllabus may have changed. Please discuss any questions you have with the instructor.
- **Classroom Seating:** To support efficient, effective contact tracing, please sit in the same seat when possible and take note of who is sitting around you; instructors may also assign seats for this purpose.
- **Technology Requirements:** This course may require particular technologies to complete coursework. Be sure to review the syllabus for these expectations, and see the syllabus technology requirements for your course. If you need access to additional technological support, please contact the Libraries' Technology Lending Service: (Technology Lending).

Course Delivery Changes Related to COVID-19

Please be aware that the situation regarding COVID-19 is frequently changing, and the delivery mode of this course may need to change accordingly, including from in-person to online. Regardless of the delivery method, we will strive to provide a high-quality learning experience.

Grading/Scheduling Changing Options Related to COVID-19

If the delivery mode has a negative impact on your academic performance in this course, the university has provided tools to potentially reduce the impact:

- **Enhanced S/U Grading Option**: Enhanced Satisfactory/ Unsatisfactory Grading Option
- **Late Drop**: Enhanced Late Drop Option

In some cases, another option may be to request an incomplete in the course. Before using any of these tools, discuss the options with your instructor and your academic advisor. Be aware that if you use the enhanced S/U, you will still need to complete the course and receive at least a C- to pass the course.

Other Important Resources

- **Keep Learning:** Keep Learning
- **Protect the Pack FAQs:** Frequently Asked Questions | Protect the Pack
- **NC State Protect the Pack Resources for Students:** Resources for Students | Protect the Pack
- **NC State Keep Learning, tips for students opting to take courses remotely:** Keep Learning Tips for Remote Learning
- **Introduction to Zoom for students:** https://youtu.be/5LbPzzPbYEw
- **Learning with Moodle, a student's guide to using Moodle:** https://moodle-projects.wolfware.ncsu.edu/course/view.php?id=226
- **NC State Libraries** Technology Lending Program