Math 241: Calculus II
Department Syllabus
Spring 2022

Prerequisite: MA 141 or it's equivalent

GEP Category: This course does fulfill a General Education Program requirement.

Materials/book: *Calculus II for Engineers and* Scientists (Franke, Griggs, Norris; accessible via WebAssign under RESOURSES; $45) Students actually pay for the webassign homework and the e-book at the same time.

Course Description: Second of three semesters in a calculus sequence for science and engineering majors. Techniques and applications of integration, elementary differential equations, sequences, series, power series, and Taylor's Theorem. Use of computational tools.

Course Structure and Rules of Engagement: There are two types of content delivery for this course, Lectures and Recitations.
<u>Lectures:</u> Monday, Wednesday, and Friday of each week are considered lecture days.
<u>Recitations</u>: Recitations are held on Tuesdays and Thursdays of each week. We plan to take attendance for these meetings. The recitations will be structured so that there is a lot of student interaction during the meeting.

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 possibly moving from synchronous sessions to an asynchronous format. Regardless of the delivery method, we will all strive to provide a high-quality learning experience.

Note: If I need to be out for an extended period of time, XXXXXXXX will take over in my absence.

Email: All emails will be sent to your official ncsu.edu email address.

Homework: Graded homework is assigned via WebAssign, (http://webassign.ncsu.edu) a web-based homework system. ***On the first day of classes*** you will be able to access your course on WebAssign and pay for access. This may be paid on the website with a check card or a credit card. You will be allowed to use WebAssign for a the first few days of class without paying, but you will be denied access to assignments if payment is not made by the due date listed on WebAssign.

You generally have **5 submissions** for each question. The final submission is the grade you receive on the assignment. I will set up a forum in Moodle for questions about the WebAssign assignments. You may post questions about exercises and give answers or hints to each other. I will chime in occasionally as needed, but this is primarily your opportunity to help each other out.

WebAssign problems make up a large portion of your final grade, so do not fall behind or skip ANY of these. There is no make-up available for missed assignments, so keep track of the due dates and START WORK EARLY on the problems. **Mathematics is not a spectator sport**! You must work

regularly in order to understand and master the concepts. Test questions will often relate to the WebAssign problems, however remember to work problems from the book as well. These are good pencil and paper practice for the tests.

Course Schedule: I will attach a lecture schedule to the end of the syllabus.

Grading: The final grade is based on Homework (15%), 4 Tests (60%), and a Final Exam (25%).

Standard Grading Scale: $97 \leq \text{A+} \leq 100$, $93 \leq \text{A} < 97$, $90 \leq \text{A−} < 93$, $87 \leq \text{B+} < 90$, $83 \leq \text{B} < 87$, $80 \leq \text{B−} < 83$, etc.

Tests:

The test is "pencil and paper", open ended questions that you will need to provide solutions for on your own paper/blue book. **NO Graphing Calculators or calculators that compute integrals or take derivatives on test day!**

Test 1: Jan 28 (Chapter 0, 1.1–1.3)
Test 2: **Feb 21** (Sections 2.1 – 2.6)
Test 3: **Apr 4** (Sections 3.1 – 3.6)
Test 4: **Apr 20** (Sections 4.1 – 4.6)

Final Exam: April 28 – May 4 (Cumulative: All sections above plus sections 4.7, 4.8, 4.9)

I expect all students to adhere to the University's regulations on academic integrity (i.e. No cheating or plagiarizing!). Talking during a test is not permitted for any reason. If a student talks or disrupts the test in any manner, that student's paper will be confiscated and he or she will be given a 0 on the test. If a student is cheating, then the matter will be referred to the Office of Student Conduct for further action

Auditing the Course: To audit the course, you must have the approval of your advisor and the Mathematics Department. In order to receive an AU, you must attend the majority of the sessions, and you must hand in all of the homework and take all of the tests. See:

https://policies.ncsu.edu/regulation/reg-02-20-04/

for more information concerning course audits.

Incomplete Grades: Incomplete grades will be handled on an individual basis. Note, however, that if an extended deadline is not authorized by an 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 attempted courses on transcripts. The burden of fulfilling an incomplete grade is the responsibility of the student. The university policy on incomplete grades is located at:

https://policies.ncsu.edu/regulation/reg-02-50-03/.

Attendance Policy/Late Assignments/Make-up Work: You are expected to attend all classes on time. Late assignments and make-up work will only be allowed for excused absences. You should contact me by email before any anticipated excused absence. If you have an unanticipated excused absence (for example, a medical emergency), you should contact me within one week of returning to class.

For complete attendance and excused absence policies, please see:

> https://policies.ncsu.edu/regulation/reg-02-20-03-attendance-regulations/.

COVID-19 Related Absences: If you need to miss class because you have been advised that you may have been exposed to COVID-19 or you have a personal or family situation related to COVID-19 that prevents you from attending our sessions, please contact me. Together we will develop a plan to help you keep up with your coursework during any such absences. COVID 19-related absences will be considered excused. You do not need any additional documentation. (But, again, please make sure you contact me.)

Academic Integrity/Honesty: Students are required to comply with the university policy on academic integrity/honesty found in the Code of Student Conduct:

> https://policies.ncsu.edu/policy/pol-11-35-01/.

It is my understanding and expectation that your signature on any test or assignment means that you have adherred to the Pack Pledge:

> I have neither given nor received unauthorized aid on this test or assignment.

Violations of academic integrity will be handled in accordance with the Student Discipline Procedures (NCSU REG 11.35.02).

Cell Phone Use: Cell phones should be turned off during class. But if you have an emergency and need to keep your phone on during class, please let me know before class.

Digital Course Components: In this course we will use Zoom and Moodle. Please see the relevant technology requirements. If you need access to additional technological support, please contact the Libraries' Technology Lending Service (Technology Lending).

Students may be required to disclose personally identifiable information to other students in the course, via electronic tools like 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.

Moodle: All reading materials and videos are housed on the course website.

Zoom: Some recitations and office hours will be conducted synchronously (Tuesday and Thursday) via Zoom. I'll post a Zoom link in your recitation section for the meeting.

I will initially put all of you on "mute", but if you want to talk, there is a button on the left side of the Zoom screen that will enable you to unmute yourself. Zoom enables us to have breakout rooms for small group discussions and we will utilize that function as well.

I will be recording our Zoom sessions and will be posting links to the recordings on our Moodle page for your use. I will only record our mathematical discussions and not, for example, the parts of our sessions where we check in with each other. In order that all students in the class feel comfortable asking questions, and making conjectures, etc., you may not share the links with anyone outside of our class.

These recordings are for use in our current class (and possibly for use in future educational purposes). By your continued participation in this recorded course, you are providing your permission to be recorded.

Diversity, Equity, and Inclusion: Diversity, equity, and inclusion are important to the success of our students at NC State. Every student, every faculty member, and every staff member who comes to NC State enriches us through their varied perspectives, knowledge, and backgrounds. Our classroom is one in which every student is respected and feels heard.

In an effort to affirm and respect the identities of transgender students in the classroom and beyond, please contact me if you wish to be referred to using a name and/or pronouns other than those listed in the student directory.

I have benefited from my majority status, the most impactful of which has been my white privilege, throughout my life. I know that our students of color face issues that I have never faced, nor will ever face. I want to affirm that I will listen to your experiences and to the experiences of all of my students if you would like to share them with me. I value your perspectives and I will advocate for your needs in our department and throughout the university.

I welcome any additional suggestions you have for including the value of diversity, equity, and inclusion in this course.

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, 2751 Cates Avenue, 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).

Non-Discrimination Policy: NC State prohibits discrimination, harassment, and retaliation based on a person's age (40 years or older), color, disability, genetic information, gender identity, national origin, race, religion, sex (including pregnancy), sexual orientation or veteran status. If you feel that you have been the subject of prohibited discrimination, harassment, or retaliation, you should contact the Office for Institutional Equity and Diversity (OIED) at 919-513-0574.

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 http://oied.ncsu.edu/divweb.

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)

- NC State CARES Team: As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that our campus remains a healthy and safe environment for learning. Occasionally, you may come across a classmate whose personal behavior concerns or worries you, either for your classmate's well-being, for your well-being or for the well-being of others. When this is the case, I would encourage you to report the 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).

Additional COVID-19 Information: 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/.)

We are most concerned about your health and the health of the students, faculty, and staff across campus. If you test positive for COVID-19, or are told by a healthcare provider that you are presumed positive for the virus, please follow 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.

Community Standards related to COVID-19: We are all responsible for protecting ourselves and our community. Please see the Community Standards 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).

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/equity/policies/

- Code of Student Conduct https://policies.ncsu.edu/policy/pol-11-35-01/

Important Resources for Students

- **NC State Keep Learning, tips for students taking courses remotely:**
  https://dasa.ncsu.edu/academics/keep-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

- **Protect the Pack FAQs:** https://www.ncsu.edu/coronavirus/frequently-asked-questions/

- **NC State Protect the Pack Resources for Students:**
  https://www.ncsu.edu/coronavirus/reactivating-campus/resources-for-students/

SCHEDULE SPRING 2022

Date	Topic	Homework Due
Jan 10	Ch 0 (derivatives, substitution, integration by parts)	
Jan 11	Ch 0: U-substitution and Integration by Parts Examples	
Jan 12	1.1 Arc Length	
Jan 13	1.2 Average Value	
Jan 14	1.3 Work (springs, emptying tank	
Jan 17		HOLIDAY
Jan 18	1.3 Work (emptying a tank)	Intro to WebAssign Entering Symbolic Answers Homework 0.1, Homework 1.1,
Jan 19	1.3 Work (lifting chains, etc)	
Jan 20	1.3 Hydrostatic Force	
Jan 21	1.3 Moments & Centers of Mass	
Jan 24	1.3 Centers of Mass	
Jan 25	Problem session	Homework 1.2, Homework 1.3
Jan 26	2.1 Trig Integrals 2.2 Trig Substitution	
Jan 27	Test 1 Review & HW session	
Jan 28	**Test 1**	
Jan 31	2.2 Trig Substitution	
Feb 1	Problem session	Homework 2.1
Feb 2	2.3 Partial Fractions	
Feb 3	Problem Session	
Feb 4	2.3 Partial Fractions	
Feb 7	2.5 Numerical Integration	
Feb 8	Problem Session	Homework 2.2, Homework 2.3
Feb 9	2.5 Simpson's Rule and Error Estimates	
Feb 10	2.4 Integral Tables	
Feb 11	2.6 Improper Integrals	
Feb 14	3.1 Intro to Differential Equations	

Feb 15	2.6 Improper Integrals Cont.	Homework 2.4, Homework 2.5
Feb 16	3.1 Slope Fields	
Feb 17	Test 2 Review & HW session	
Feb 18	3.1 Euler's Method	
Feb 21	**Test 2**	
Feb 22	3.2 Separable Equations	Homework 2.6, Homework 3.1
Feb 23	3.2 Orthogonal Trajectories	
Feb 24	3.3 Exponential Growth	
Feb 25	3.3 Logistic Growth 3.3 Newton's Law	
Feb 28	3.3 Mixing Problems	
Mar 1	3.3 Newton's Law Examples 3.3 Compound Interest	Homework 3.2
Mar 2	3.4 2nd Order Linear d.e	
Mar 3	Problem Session	
Mar 4	3.4 2nd Order Linear d.e.	
Mar 7	3.4 Case 3	
Mar 8	Problem Session	Homework 3.3
Mar 9	3.4 BVPs 3.5 Undetermined Coefficients	
Mar 10	3.5 Undetermined Coefficients and the Superposition Principle	
Mar 11	3.5 Undetermined Coefficients	
Mar 14-Mar 18		SPRING BREAK
Mar 21	3.6 Springs	
Mar 22	Problem Session	Homework 3.4
Mar 23	3.6 Circuits	
Mar 24	3.6 Springs/circuits - Recitation	
Mar 25	4.1 Sequences	
Mar 28	4.2 Series	
Mar 29	Problem session	Homework 3.5, Homework 3.6
Mar 30	4.2 Series	
Mar 31	Test 3 Review	
Apr 1	4.3 Integral & Comparison Tests	
Apr 4	**Test 3**	
Apr 5	4.3 Integral & Comparison Tests	Homework 4.1

Apr 6	4.3 Integral Test Estimation 4.4 Alternating Series Test	
Apr 7	Problem Session	
Apr 8	4.5 Ratio Test	
Apr 11	4.5 Ratio Test	
Apr 12	4.4 Alternating Series 4.5 Absolute Convergence	Homework 4.2, Homework 4.3
Apr 13	4.6 Power Series	
Apr 14	4.7 Power Series Representations	
Apr 15	4.7 Differentiation/Integration of Power Series	
Apr 18	4.8 Taylor and Maclaurin Series,Binomial Series	
Apr 19	Test 4 Review & Problem session	Homework 4.4, Homework 4.5, Homework 4.6
Apr 20	**Test 4**	
Apr 21	Problem session, Binomial Series	Homework 4.7
Apr 22	4.9 Taylor Polynomials & Review	
Apr 25	Review	Homework 4.8, Homework 4.9 LAST DAY OF CLASSES
Apr 26-Apr 27	Reading Days	
Apr 28-May 4	Final Exams	