

MA 241-002: Calculus II
Summer I 2021

Instructor:	Hassan Hatam
Recitation Leader:	John Graf
Time and Place:	MTWHF, 10:20 AM - 12:30 PM Online Synchronous Zoom Sessions
Office:	Zoom Meetings
Email:	hhatam@ncsu.edu (Hassan) jrgraf@ncsu.edu (John)
Office Hours:	MW 12:30 - 1:30 PM, Tu 9:15 - 10:15 AM (Hassan) TBA (John)

Prerequisites: MA 141 with grade of C- or better, or AP Calculus credit. A thorough and working understanding of algebra, trigonometry and derivatives is essential for success in MA 241.

Course Description: In this second semester of the calculus sequence, we will develop the mathematical techniques needed to evaluate elementary integrals and to solve differential equations, and we will define and study the behavior of infinite sequences and series. In each chapter, we will learn how to apply these techniques to a variety of application problems from scientific and engineering fields. Upon completing this course, you (the student) should

- be able to analyze a problem and identify what methods of calculus must be used to solve it;
- know how to apply calculus to solve specific application problems in physics and engineering;
- have developed critical thinking skills to evaluate and solve new problems requiring multiple calculus techniques.

Course Format: The course in its entirety will be delivered and administered remotely in a *synchronous* format. This means that lectures will be held live via Zoom at the same times every week, and problem sessions will also be held live during class hours. The lectures will, however, be recorded so that you may access them later. Homework will be assigned regularly, and will be completed online via WebAssign. We will have three in-term tests and one final exam, all administered remotely via Zoom. Office hours will be held weekly via Zoom as well.

Textbook: We will use the text *Calculus for Engineers and Scientists, Volume II* by Franke, Griggs, and Norris. The text will be accessible from WebAssign. Lectures will roughly—but not precisely—follow the presentation in the text.

Course Materials: Each student is expected to obtain the course textbook, be able to access homework assignments on WebAssign, and have access to the course Moodle page. The Moodle page—which is accessible through Wolfware—will serve as the central hub for the course. This is where announcements are made, course documents (such as this syllabus) and recordings are kept, notes from problem sessions are posted, and all links to Zoom sessions, office hours, the WebAssign page, as well as tests and the final exam can be found. A graphing or scientific calculator is an optional tool, but is quite useful for checking homework problems, graphing functions, and automating certain numerical processes once they are well-understood.

Lectures: The main instructional component of the course consists of lectures given every day via Zoom. Lectures will be broken up by a break of about five minutes midway through class. Lectures will be recorded and the recordings made available on the course Moodle page.

Problem Sessions/Recitations: Problem sessions, or recitations, will be held live via Zoom three hours per week, and will be led by John Graf, our teaching assistant. Recitations will by default occur during the second hour of class on Mondays, Wednesdays, and Fridays, but might occasionally occur on a Tuesday or Thursday, if, for instance, a university holiday falls on a usual recitation day, or if some other reason necessitates a change in schedule, so please read all emails and announcements in order not to miss a recitation session. The sessions will last approximately an hour, during which time John will work out problems, provide examples, and answer questions related to homework or the material. Recitations are meant to be the setting to resolve technical questions about the material, participate a bit more freely than in lecture, and practice techniques or review for tests. Notes from recitations will be kept on Moodle.

Homework: Homework will be assigned regularly and is an important component of the course. Homework assignments will be announced each week and can be found on the WebAssign page. Each of you will need to purchase access to WebAssign through Cengage in order to gain access to the homework assignments and course text. A guide on how to obtain and set up WebAssign may be found in the following Google Document:

<https://docs.google.com/document/d/1J0bSkhmH-odVskB1XbkhudT7SjK0C005kDMcJJzWEbg/edit?usp=sharing>

Many of the techniques and methods we will learn require a fair bit of practice to master, and the homework sets are intended to provide such practice, as well as to elucidate the concepts contained in the current section. I (Hassan) strongly urge that you keep up with homework by working some amount of problems every day. If you feel like the assigned homework is not giving you enough practice, there are many problems in the course text that you can work for extra practice, and I can provide you with further problems if needed. All homework sets will be due by the end of the course, a little before the final exam. This is mainly due to the condensed nature of the five week session, so that students do not feel overwhelmed by

the assignments. Do not let this give the impression that homework is unimportant or may be skipped; rather, make sure to stay on top of the homework and work at least some of all of the current assignments as they are assigned, since tests will cover concepts for which the homework provides excellent practice. Keep in mind, too, that the homework is graded.

Tests and Final Exam: We will have three in-term tests and a final exam. No cooperation or outside help is allowed on tests or the final exam, but the exams will all be open book, open notes, and open to the resources available on the course webpages. All tests and the final exam can be found on the Moodle page on the appropriate date and will be timed. Your lowest in-term test grade will be dropped, and 10% of the points earned on this lowest test will be added to your final exam point total. The dates for the tests (which might be subject to change) and final exam (which is *not* subject to change) are as follows.

Test 1:	Tuesday, May 25
Test 2:	Thursday, June 3
Test 3:	Monday, June 14
Final Exam:	Friday, June 25

The final exam will be cumulative, and will be held on **Friday, June 25 from 8:30 - 11:00 AM** on Zoom, and this date is non-negotiable unless you have three final exams within 24 hours, in which case you should let me know this well before we enter finals week.

All tests and the final will be held live on Zoom with students muted but with cameras on. We will need to be able to see you as you work, so no virtual backgrounds will be allowed. If you have technical difficulties regarding a camera, please let me know *before* the first test. Students will write solutions by hand on paper and then photograph and upload the images to a single pdf file in Moodle. Tests will occur during the second hour of class, after an hours' lecture, and will be written to be ~ 60 minute exams including upload time. John will grade the tests and exams, and you have one week from the date of return of a test to raise any questions or objections regarding the grading of the test, which you should do in a private meeting with one of us, and not during class. Original tests should not be altered in any way before such a challenge to the grade is made.

If an in-term test is missed with an *excused* absence (that is, university-approved reason, with supporting documentation), then a make-up test may be scheduled individually. If the reason for such an absence is known before the test date, then the make-up test be requested **before the normal test date**. The setting for the make-up will be determined by me with input from the student(s) who missed the test, and the topics covered may not be exactly identical to the ones on the missed test. If an in-class test is missed due to an unexcused absence, then no make-up will be given, and the test will be marked with a score of zero. All absences that require a make-up test or other special accommodations must go through the NCSU absence verification process, which can be found at <https://dasa.ncsu.edu/students/absence-verification-process/>.

Grading Policy: The final grade for the course will be based on a ten point scale as follows:

A	:	90	-	100
B	:	80	-	89
C	:	70	-	79
D	:	60	-	69
F	:	0	-	59

The cutoffs for $\pm$ grades will be determined at the end of the course. Your final grade will be determined as follows:

Homework	16%
In-term Tests	48%
Final Exam	36%

As mentioned above, the lowest in-term test score will be dropped, but you will earn 10% of the score on this lowest test as points towards your final exam.

Attendance and Class Participation: Attendance will be taken every day, and it is expected that you either attend the lectures and recitations, or view the recordings if you must miss class; however, attendance does not make up any portion of your final grade. Reference might be made to material explained in past sessions, so please take notes or review the recordings to keep up with the material. Participation during both the Zoom—by asking or answering questions, for instance—is highly encouraged, particularly if there is any trouble understanding the material.

Office Hours: I will hold three office hours weekly, and John will hold one hour per week. If you are unable to visit during the given office hours but wish to see us, you may email us to schedule an appointment, and we will do our best to accommodate you. Office hours may be subject to change, and such changes will generally be announced via the Moodle page. Please come visit during office hours if you feel like you are falling behind, or if you have questions about the material or homework; office hours are meant for your benefit, and are meant to be a more relaxed and informal setting than lectures and recitations.

Course Policies and Academic Integrity: It is your responsibility to keep up with announcements, to obtain notes from Moodle or classmates for missed problem sessions, and to be aware of test dates and homework due dates. You may work on homework assignments in groups—in fact, this a good way to learn—but make sure you understand the material yourself.

I assume that anything turned in with your name on it is your own work. Each time you submit a test or WebAssign you affirm the honor pledge: “I have neither received nor given unauthorized aid on this assignment.” The minimum penalty for cheating is a grade of zero on the assignment; violators will be reported to the Academic Integrity Review Board, which can impose additional sanctions. The code of student conduct can be found at <http://studentconduct.dasa.ncsu.edu/code/>.

Disability Resources: Reasonable accommodations will be made for students with verifiable disabilities. To receive accommodations, students must register with Disability Services

for Students, which can be found at <https://dro.dasa.ncsu.edu/> or at Holmes Hall, Suite 304, 2751 Cates Avenue, Campus Box 7509, 919-515-7653.. Please consult the Academic Accommodations for Students with Disabilities Regulations (REG02.20.1) for more information on NC State's policy on working with students with disabilities. You must discuss accommodations with me **prior** to an exam date.

List of Policies: Students are responsible for reviewing the NC State University policies, rules and regulations that pertain to their course rights and responsibilities:

- (1) [Equal Opportunity and Non-Discrimination Policy Statement](#)
- (2) [Code of Student Conduct](#)
- (3) [Grades and Grade Point Average](#)
- (4) [Credit-Only Courses](#)
- (5) [Audits](#)

General Expectations/Keys to Success:

- Take good notes during lectures and problem sessions. Ask questions when you are confused.
- Keep up with homework and work extra problems if you feel you aren't getting enough practice. It is important not to fall behind early. A good strategy is to work on the assignments early and often, a bit at a time, rather than trying to finish several assignments in one day. It is also a very good idea to work homework problems on paper and to keep these pages in one place, so that you can review more easily for exams, detect errors, or be able to refer to your work when consulting with me or others.
- Importantly, check the Moodle site and your email regularly. It is your responsibility to be aware of announcements, especially regarding exam dates and homework deadlines.
- If you find yourself falling behind, please contact me by email, visit me during my office hours, or by appointment. It is also a good idea to get to know a few of your classmates so that you can support each other.
- **It is understood that your name or signature on any assignment or exam or online submission indicates your adherence to the NC State Honor Pledge: "I have neither given nor received unauthorized aid on this test or assignment."**

I hope you will find the course enjoyable and informative, and I look forward to teaching and getting to know all of you this summer!

Course Schedule (subject to change):

Date	Hour 1	Hour 2
May 19	Syllabus, MA 141 Review	Arclength (1.1) Average Value (1.2)
May 20	Work: Springs (1.3)	Work: Moving Slices (1.3)
May 21	Force due to Fluids (1.3)	Recitation 1
May 24	Test 1 Review	Recitation 2
May 25	Trig Integrals (2.1)	Test 1
May 26	Trig Sub (2.2)	Recitation 3
May 27	Trig Sub, Partial Fractions (2.3)	Partial Fractions
May 28	Trapezoid Rule (2.5)	Recitation 4
June 1	Trapezoidal Error (2.5), Improper Integrals (2.6)	Improper Integrals
June 2	Improper Ints VAs (2.6), Begin Test 2 Review	Recitation 5 (w/ review)
June 3	Differential Eq'ns Intro (3.1)	Test 2
June 4	Slope Fields, Euler's Method (3.1)	Recitation 6
June 7	Separable DEs (3.2)	Recitation 7
June 8	2 nd order DEs (3.4)	2 nd order nonhomogeneous DEs (3.5)
June 9	2 nd order nonhomogeneous DEs	Recitation 8
June 10	Sequences (4.1), Geometric Series (4.2)	Telescoping, Harmonic Series (4.2)
June 11	Test 3 Review	Recitation 9
June 14	Test for Divergence, Int Test (4.2)	Test 3
June 15	Comparison, Limit Comp Tests (4.3)	p-Series, Estimation (4.3)
June 16	Alternating Series, Alt. Series Estimation (4.4)	Recitation 10
June 17	Alt. Series Test, Absolute Convergence (4.5)	Cond't'l Conv. (4.5), Series Overview
June 21	Power Series, Ratio Test, IOC (4.6,4.7)	Recitation 11
June 22	Fns as P.S., Taylor Series (4.8)	Taylor Series, Binomial Series (4.8)
June 23	Final Exam Review	Final Exam Review
June 25	FINAL EXAM	8:30 - 11:00 AM