MA 241-002: Calculus II
Summer 1 2020, M-F, Online

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Office hours.

My office hours are on Mondays 3 - 5pm or by appointment. I can make something work M-T, just send me an e-mail to set up a Zoom meeting. If you have questions, I encourage you to set up meetings frequently. It's much easier for me to address small questions multiple times throughout the week, than it is for me to attempt to explain an entire week's worth of material right before the exam.

Course Description.

In this second semester of the calculus sequence, we will develop the mathematical techniques needed to solve elementary differential equations and integrals, as well as discover the behavior of 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.

Learning Outcomes.

(1) Students will be able to analyze a problem and identify what methods of calculus must be used to solve it.
(2) Students will be able to apply calculus to solve specific application problems in physics and engineering.
(3) Students will develop critical thinking skills that will enable them to evaluate and solve new problems that combine multiple calculus techniques.

Prerequisites.

MA 141 with grade of at least C-, AP Calculus credit, or Higher Level IB credit.

Attendance Policy.

This class is entirely online and there will be no attendance recorded. The lecture videos are available online for access at any time. It is imperative for your success in the class to watch all of the assigned lecture videos each week as well as the problem sessions. The problem sessions will be held live through Zoom on Mondays and Wednesdays from 1.55 - 2.45 pm. These sessions will be recorded and posted on the Moodle page. These are not mandatory to attend, but you do need to watch the recordings if you cannot attend them.

Required Materials.

(1) *WebAssign access code:* You must purchase access to homework assignments and study materials via WebAssign.
(2) *Textbook:* Calculus for Engineers and Scientists, Volume II (Franke, Griggs, Norris: accessible via WebAssign).

Use of online resources such as Wolfram Alpha or Paul's Online Math Notes during homework and study is highly encouraged. Graphing calculators will **not** be allowed on tests, only scientific calculators that cannot compute integrals or derivatives are acceptable.

Structure and Grading.

Letter grading follows the +/- 10 point scale on the right below. All other grading in accordance with University policy. Grades will be determined as shown on the left below.

Component	Weight
WebAssign	10%
3 Tests	60%
Final Exam	30%

98-100	A+	93-97.99	A	90-92.99	A-
87-89.99	B+	83-86.99	B	80-82.99	B-
77-79.99	C+	73-76.99	C	70-72.99	C-
67-69.99	D+	63-66.99	D	60-62.99	D-

Webassign HW.
WebAssign homework assignments are obtained, submitted, and graded online. Assignments corresponding to the sections covered the previous and/or current week. The due dates for assignments can be viewed on WebAssign, and might be subject to change at the discretion of the instructor.

Tests.
These tests will be open-book and open-notes. All use of other online resources is **prohibited**. Collaboration of any kind with anyone is **prohibited**. A scientific calculator is permitted, but not required. Graphing calculators are **not** allowed. If it improves your overall grade, then I will replace your lowest test score with your final exam score. I will write the tests to last approximately 1 hour. After you open your test on Moodle you will have 1.5 hours to solve the problems and upload your solutions to Moodle, after which time submissions will not be accepted. This extra half hour should give you ample time to scan your work and upload it.

Test #1: Wednesday, May 20th covering Chapters 1.1 - 1.3
Test #2: Monday, June 1st covering Chapter 2.1 - 2.6
Test #3: Monday, June 8th covering Chapter 3.1 - 3.5

Final Exam.
The final exam date is scheduled by the University for **Wednesday, June 17** and is non-negotiable unless you have 3 exams within 24 hours. Determine as early as possible if that is the case, as you must go through the registrar and math department to reschedule. There will be no other make-ups given for the final exam. I will write the final exam to last approximately 3 hours. After you open your test on Moodle you will have 3.5 hours to solve the problems and upload your solutions to Moodle, after which time submissions will not be accepted. This extra half hour should give you ample time to scan your work and upload it.

Test Make-up Policy.
Test make-ups are administered in accordance with University policy. Anticipated, excused absences (such as NCSU obligations, required court attendance, and religious observance) must be reported to the instructor with appropriate certification *well before* the scheduled test date. Legitimate emergency absences must be reported with appropriate documentation verifying your inability to be in class on the day of the test within one week of returning to class. No other make-ups will be given.

Corrections to Grading.
If you think an error may have been made in the grading of your test, contact the grader of the test question within one week of the exams being returned to the class. Do NOT alter the original work.

Resources for Assistance.
Office hours are exclusively held for your benefit but are most valuable if you prepare specific, thoughtful questions. I also highly recommend Paul's Online Math notes.

Accomodations.
Reasonable accommodations will be made for students with verifiable disabilities. In order to take advantage of available accommodations, students must register with the Disability Resources 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)

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

MA 241-002 Tentative Schedule
This schedule is subject to necessary change.

DATE	SECTION	TOPIC
Optional Review	§0.1 - 0.8	Calculus 1 Review
May 13 - Wednesday	§1.1	Arc Length **Problem session**
May 14 - Thursday	§1.2 - 1.3	Average Value
May 15 - Friday	§1.3	Work: Springs Work: Move "Slices"
May 18 - Monday	§1.3	Force Due to Hydrostatic Pressure **Problem session**
May 19 - Tuesday	§1.1-1.3	**Test 1 Review at 1.55 – 2.45 pm**
May 20 - Wednesday	**§1.1 - 1.3**, 2.1	**Test #1**, Trigonometric Integrals (sin/cos) Optional: Trigonometric Integrals (sec/tan)
May 21 - Thursday	§2.2	Trigonometric Substitution
May 22 - Friday	§2.2 – 2.3	Trigonometric Substitution Partial Fraction Decomposition
May 25 - Monday	**No class.**	**Memorial Day**
May 26 - Tuesday	§2.5	Trapezoidal Rule
May 27 - Wednesday	§2.5, 2.6	Trapezoidal Error Improper Integrals: Infinite Limits **Problem session**
May 28 - Thursday	§2.6	Improper Integrals: Infinite Limits Optional: Improper Integrals: Vertical Asymptotes
May 29 - Friday	§3.1	Differential Equations Intro Slope Fields
June 1 - Monday	**§2.1-2.3, 2.5- 2.6**, 3.2	**Test #2**, Separable Differential Equations
June 2 - Tuesday	§3.4	2nd Order DEs: 2 Real Roots, Double Root, Complex Roots
June 3 - Wednesday	§3.5, 4.1	2nd Order Nonhomogeneous (Exponential/Polynomial) Sequences Optional: 2nd Order Nonhomogeneous (Sin/Cos) **Problem session**
June 4 - Thursday	§4.2	Series: Infinite Geometric Series
June 5 - Friday	§4.2	Series: Telescoping, Harmonic
June 8 - Monday	**§3.1-3.2, 3.4-3.5**, 4.2	**Test #3** Series: Test for Divergence, Integral Test
June 9 - Tuesday	§4.3	Comparison Test, Limit Comparison Test, p - series
June 10 - Wednesday	§4.3 – 4.4	Estimation of Sum, Alternating Series Optional: Alternating Series Estimation **Problem session**
June 11 - Thursday	§4.5	Absolute Convergence, Conditional Convergence
June 12 - Friday	§4.6 - 4.7	Power Series: Ratio Test: Interval of Convergence

		Functions as Power Series Optional: Interval of Convergence Pt 2
June 15 - Monday	§4.8	Taylor Series: Maclaurin Series Taylor Series: Maclaurin Series: e^x, sin Optional: Binomial Series Algebra of Power Series
June 16 - Tuesday	1.1 – 4.8	Exam review
June 17 - Wednesday		**Final Exam**