Calculus II for Science and Engineering (Math 2260)

Spring 2013

1 Technicalities

Instructor: Dr. Clayton Shonkwiler (clayton@math.uga.edu)
Office: Boyd 436
Course web page: http://www.math.uga.edu/~clayton/teaching/m2260s13/
Text: *University Calculus: Early Transcendentals* (2nd edition), by Joel Hass, Maurice D. Weir, and George B. Thomas, Jr.
Times/Locations: 10:10–11:00 MWF, 9:30–10:45 T, all in Boyd 323.
Office Hours: Wednesdays 3:00–4:00 and Thursdays 1:00–2:00.

2 Summary of the Course

This course is devoted to developing the concepts first introduced in Calculus I. After developing the theory of integrals and how to both compute them and apply them to real problems, we will circle back to infinite series, which underlie the definition of the definite integral and are important tools for computation and approximation. Finally, we will extend the domain of discourse from the real line to three-dimensional space, introducing vectors and their products.

You should understand each of these concepts theoretically, geometrically, and heuristically and be able to compute effectively enough to apply them appropriately. In order to do so you will need to develop your abilities to think mathematically and communicate effectively.

3 Homework

There will be weekly homework assignments which will typically consist of a mix of WebWork problems (which you complete online; see below for instructions) and written problems (which you turn in to me). There will also be a single laboratory assignment on numerical integration.

Homework is an important part of any math class, as it is impossible to *learn* mathematics without actually *doing* mathematics. The goal of the assignments is to deepen your understanding of the concepts, tools and techniques discussed in class, as well as to give you the opportunity to practice explaining your mathematical thinking. The importance of effective communication is vital: knowledge without the ability to communicate that knowledge is of limited value. As such, to get full credit on a problem your solution must be clear and well-written.

The written portion of your homework must be stapled with your name clearly written at the top. What you turn in should be a final copy: it should be neat, legible, and well-organized. If I can't read or understand your work you won't receive any credit.

Late homework will not (and, in the case of WebWork, **cannot**) be accepted, so you should turn in whatever you have completed on the due date in order to get credit for it. Your lowest homework grade will be dropped from the calculation of your final grade.

Your are welcome to work together on homework, but be warned that each student's WebWork problems are slightly different, so copying someone else's answers won't be very effective. Also, if

you become dependent on others to complete your homework, it is very unlikely you will do well on the exams. Collaboration on the written portion of homework **must be acknowledged**.

If you feel that you need more practice with problems from a given section, a list of suggested problems is available on the departmental syllabus for Math 2260:
http://www.math.uga.edu/undergraduate/MATH2260deptsyllabi.pdf

3.1 WebWork

You can log in to WebWork at https://webwork2.math.uga.edu/webwork2/Math2260_Shonkwiler_S13. Your username comes from your `uga.edu` email address; for example, if your email address is `jones@uga.edu`, then your username is `jones`. Your password comes from your 810 number, but it's formatted a bit oddly. If your UGAcard says your 810 number is `810 012 9770`, then it appears on our class roll as `810-01-2977` (the last digit on your card is not actually part of your 810 number; a 0 indicates that this is your first UGAcard, a 1 that it's your second UGAcard, etc.). Then your initial WebWork password is `810-01-2977` *including the dashes*.

When you first log in to Webwork, you'll see three buttons on the left. Use the "Change Email" button to enter your email address and the "Change Password" button to change your password. If you haven't used WebWork before, try the "Orientation" and "MAAtutorial" assignments to see how the system works.

Until a WebWork assignment is due, you can try the problems as many times as you like, and the system will tell you whether or not you have the right answer. This lets you correct your work immediately. After the assignment's due date, the system will show you the correct answer for each problem when you try it (but your answers won't be scored).

4 Exams

There will be three midterm exams and a final. The midterms will be one-hour in-class exams and are tentatively scheduled for February 1, March 8, and April 19. The final exam is scheduled for **Friday, May 3 from 8:00–11:00 AM**. All exams are closed-book, though for each exam you are welcome to prepare one $8^1/_2'' \times 11''$ sheet of hand-written notes for use during the exam. Collaboration is not allowed on any of the exams.

No make-up examinations will be given in the course. If you are absent from a scheduled exam and your absence is excused (with supporting documentation from, e.g., a medical or legal professional), the portion of the course grade determined by the missing exam will be divided equally between the other exams (including the final). Students with excused absences from all four exams will be withdrawn or given a grade of "I".

5 Grading and WP/WF Policy

Your final grade in the course will be determined by:

Homework: 15% (lowest dropped)
Numerical Integration Lab: 5%
Midterm Exams: 20% each
Final Exam: 20%

Here's how the grading process works. First, I compute an overall course grade for you on a scale of 0–100 by combining your exam and homework grades with your lab grade using the weights above. For example, if you have scores of 75%, 80%, and 60% on the three midterms, 85% on the final, 90% on the homework (overall), and 80% on the lab, I would compute this score as

$$\underbrace{0.75 \times 20 + 0.80 \times 20 + 0.60 \times 20}_{\text{midterm exams}} + \underbrace{0.85 \times 20}_{\text{final}} + \underbrace{0.90 \times 15}_{\text{homework}} + \underbrace{0.80 \times 5}_{\text{lab}} = 77.5.$$

After computing this score, I rank everybody in the class in order by their score and assign cutoffs for 'A', 'B', 'C', and 'D'. Generally these are somewhat lower than the traditional 90, 80, 70, and 60. When setting the cutoff I consider the students immediately above and below the line and try to take into account improvement and other circumstances. That being said, the list is never, ever reordered. Regardless of other circumstances, a better score in the class should always earn at least as good a letter grade. Ultimately, I can only grade the course based on what's in your written work.

In order to receive a grade of "WP" before the first exam, you must have received at least 50% of the homework points available by the date of withdrawal. After the first exam, this policy will remain in force for a two week grace period; after that, you must have received at least 50% of the homework points *and* 50% of the points on the first exam to receive a "WP".

6 Attendance

Students are expected to attend class regularly. Students who miss more than 6 classes may be withdrawn from the course by the instructor.

7 Academic Honesty

As a University of Georgia student, you have agreed to abide by the University's academic honesty policy, "A Culture of Honesty", and by the Student Honor Code. All academic work must meet the standards described in "A Culture of Honesty", which can be found at http://www.uga.edu/honesty. Lack of knowledge of the academic honesty policy is *not* a viable explanation for a violation. Questions related to coursework and the academic honesty policy should be discussed with the instructor.

It is perfectly acceptable to collaborate with classmates on homework problems in this course *so long as such collaboration is acknowledged*. However, the goal of collaboration is to help you to understand the problem yourself; if you can't write up your solution independently then you didn't really understand it! Recruiting someone else to complete your homework or to tell you the answers or copying someone else's solution is a violation of the honesty policy.

Unfortunately, based on my own experience and that of my colleagues, academic dishonesty seems to be on the rise at the University. To be clear: academic dishonesty will not be tolerated in my class. Just so that you are aware:

(1) Every instance of suspected academic dishonesty must be handled through the University process. Instructors have no discretion about whether or not to invoke this process.

(2) Lying to your instructor (e.g. about why you missed class or need an extension on homework) is a violation of the academic honesty process which, by (1), must be handled by the university process.

(3) Your instructors are not ignorant of the existence of Facebook, Twitter, and Google.

(4) Nobody enjoys going through the formal university process for dealing with academic dishonesty, so please keep (2) and (3) in mind before explaining why you missed class or need a homework extension.

(5) Using your phone during a test is a violation of the academic honesty policy. Again, by (1), this means that using your phone during an exam will trigger the university process. Please note that your phone is not invisible.

(6) The most common consequence for a first offense of cheating on an exam is an immediate "WF" in the course.

(7) The most common consequence for a second offense is removal from the University, either temporarily or permanently.

8 Additional help

If I were a perfect teacher, you could learn everything you need to know just by going to class. Unfortunately, I am not a perfect teacher, so there's a good chance that, at some point, you'll find yourself confused, stuck or otherwise frustrated by the material or the course. If you do, ask for help! Office hours are, of course, an excellent venue for this, but if you feel uncomfortable asking my help or if you find that my teaching style and your learning style simply don't mesh, there are many other resources available to you.

First and foremost, your fellow classmates are a great resource. Odds are that, for any question you have, there's someone in the class who can answer it, so don't be afraid to ask. Even the simple process of explaining why you're stuck to someone who is just as confused as you is often enough to make things clearer. Just be sure to return the favor when you get the chance to help someone else.

Second, the math department provides a calculus study hall on Monday, Tuesday, and Thursday afternoons in Boyd 222. Please see the department's Student Services page for the schedule: http://www.math.uga.edu/about_us/student_services.html.

Third, the Miller Learning Center has math tutoring available Monday–Thursday evenings from 5:30–8:30 in MLC Room 368; for more information, see http://mlc.uga.edu/services/tutoring.html. The Milledge Academic Center also has math tutoring during the day Monday–Friday in the Milledge Hall Learning Center Math Lab and Sunday–Thursday evenings at different locations around campus as well as online; see http://tutor.uga.edu/arc/tutoring/#drop-in-tutoring.

Fourth, UGA's Divison of Academic Enhancement coordinates individual tutoring by appointment. To connect with a tutor, you should visit the DAE's Tutoring by Appointment page: http://tutor.uga.edu/arc/tutoring/#tutoring-by-appointment.

Finally, the math department also maintains a list of recommended private tutors (typically graduate students and advanced undergraduates) on the Student Services page: http://www.math.uga.edu/about_us/student_services.html.

If none of the above is suitable or practical, please let me know and I'll be happy to help you find additional resources.

9 Accommodations

If you think you may need accommodations in this course due to the impact of a disability please meet with me privately as soon as possible. You should also contact the Disability Resource Center (http://drc.uga.edu/) to confirm your eligibility for appropriate accommodations. Doing so early in the semester will help you to avoid unnecessary frustration.

10 Disclaimer

The course syllabus is a general plan for the course; deviations announced in class may be necessary.

11 Anticipated Schedule

Week	**Subjects (Sections from the text)**
01.07–01.11	Integrals & the Fundamental Theorem of Calculus (Ch. 5)
01.14–01.18	Volumes (6.1–6.2)
01.21–01.25	Arc length and areas (6.3–6.4)
01.28–02.01	Work (6.5) **MIDTERM #1**
02.04–02.08	Exponential change and separable differential equations (7.2)
02.11–02.15	Integration by parts and trigonometric integrals (8.1–8.2)
02.18–02.22	Trigonometric substitutions and partial fractions (8.3–8.4)
02.25–03.01	Numerical integration (8.6) and **NUMERICAL INTEGRATION LAB**
03.04–03.08	Improper integrals (8.7) **MIDTERM #2**
03.11–03.15	SPRING BREAK
03.18–03.22	Sequences (9.1)
03.25–03.29	Series and the Integral Test (9.1–9.2)
04.01–04.05	Comparison, Ratio, and Root Tests (9.3–9.5)
04.08–04.12	Alternating Series, Power Series (9.6–9.7)
04.15–04.19	Taylor and MacLaurin Series (9.8) **MIDTERM #3**
04.22–04.26	Vectors and vector products (11.1–11.5)
04.29	Review
05.03	**FINAL EXAM at 8:00 AM**