Syllabus: Calculus II for Engineers (MATH 1910)
Summer 2018

Contact Information and Coordinates

Instructor: David Mehrle (rhymes with "early") (dfm223@cornell.edu)
Teaching Assistant: John Whelan (jhw268@cornell.edu)
Class: Every weekday 8:30am - 9:45am in Malott 224
Office Hours: Thursdays from 2pm - 4pm in Malott 256 or by appointment (David)
Monday/Tuesday from 3pm - 4pm in Malott 256 (John)
Class Website: pi.math.cornell.edu/~dmehrle/teaching/18su/1910

About this class

This is a second course in calculus which focuses on integral calculus and infinite series. Together with its sequel, *Multivariable Calculus for Engineers* (MATH 1920), this class aims to provide you with the fundamental skills required to understand and use the mathematical tools you will encounter as an engineer. Throughout the course, you will develop the ability to solve conceptual and application-based calculus problems via regular practice, both in and out of class.

Learning Objectives

By the end of the course, you will be able to:

- compute definite and indefinite integrals using substitution, integration by parts, partial fractions, and other techniques;
- use integral calculus to solve application-based problems arising in engineering (such as computing work or flow rates), and interpret the answer to such a calculus problem in terms of its original context;
- compute geometric quantities (such as area, volume, and arc length) with integrals;
- test for convergence and divergence of infinite sequences and series.

PREREQUISITES

You are expected to have taken the equivalent of three years of high school mathematics, including geometry and trigonometry, and at least one course in differential calculus. At a minimum, you should be familiar with:

- trigonometry: values of sine and cosine and tangent, the unit circle, and trigonometric identities;
- visualizing shapes (cones, circles, spheres, etc.) in 2D and 3D space and describing them algebraically (e.g. a unit circle is defined by the equation $x^2 + y^2 = 1$);
- graphing polynomial, exponential, logarithmic, and trigonometric functions;
- taking limits of polynomial, exponential, logarithmic, and trigonometric functions;
- derivatives of polynomials, exponentials, logarithms, trigonometric functions using the power rule, product rule, and chain rule;

You do not need to have 100% mastery of these skills to succeed in the course if you take the time to review each item as it comes up. However, due to the compressed timetable for the summer semester, we won't take much time (if any) in class to review. If you have any concerns about how your background might affect your performance in the course, please talk to me during the first few days of class.

CLASS FORMAT

Class will be formatted as three lectures and two recitations per week. Because the summer semester is very short, we will move very fast – one or two textbook sections per day. To facilitate this fast pace, there will be short reading assignments almost every day.

Over the course of the semester, there will be sixteen reading assignments, four homework assignments, one midterm exam and one final exam.

EXPECTATIONS

You are expected to stay on top of the reading assignments or you will become very quickly lost in the class. Moreover, I expect you to attend class regularly or you will rapidly fall behind. You may not understand everything right away, but I do hope that you'll ask questions when you are confused.

On homework, exams, and in-class activities, I expect you to **show all of your work.** Unless otherwise noted, writing down an answer with no supporting evidence will receive

the same credit as no answer at all. All assignments must be turned in on Gradescope (see below). **No late work will be accepted.**

You will retain much more material if you refrain from using your cell phone during class. However, I realize that the classes are long and you will want to get up and stretch your legs or look at your phone. I will do my best to build a 5-minute break into the middle of each class.

You are expected to abide by the Cornell Academic Integrity policy at all times. For more information, see http://cuinfo.cornell.edu/aic.cfm.

TEXTBOOK

J. Rogawski and C. Adams, *Calculus*, 3rd edition, (W.H. Freeman & Company, NY, 2015). ISBN: 978-1-4641-7501-5

The single variable version of this textbook is required for homework assignments, but if you plan to take Multivariable Calculus for Engineers (MATH 1920) in the future, you may wish consider buying the full textbook, which contains both single variable and multivariable calculus.

This textbook is on reserve in the Math Library on floor 4 of Malott Hall.

ASSESSMENT

GRADESCOPE

You must turn in all assignments using Gradescope (https://gradescope.com), and all of your grades will be available there. You should receive an email inviting you to join the course, but if not, you can use the code `M3JYVE` to join.

Gradescope requires that you upload your assignments in PDF format. If you have a smartphone, there are plenty of free scanner apps that will turn handwritten work into a PDF (I use the Dropbox app). There are also scanners in the Math library, in Olin library, and in Mann library that you are welcome to use.

If you have problems with Gradescope, please email me.

PARTICIPATION

Learning is not a passive process. You are expected to actively participate in your own learning, which means attending class, asking questions, and participating in recitations. Active participation also means that you aren't on your phone in class.

Reading Assignments

Because the summer session is so short, it is imperative that you keep up with the material. There will be frequent short reading assignments to help guide your study. Reading assignments will be graded for completion.

Each reading assignment will have a suggested reading for review and a list of learning objectives. The review is optional, but you may find it helpful. The learning objectives are objectives for the entire lesson, not for the reading assignment alone.

Reading math is not like reading a novel. You must read actively: stop and try to work out problems on your own, or see if you can recreate the example. For more on reading math, see http://www.people.vcu.edu/~dcranston/490/handouts/math-read.html.

Please keep in mind that **no late assignments will be accepted.** Reading assignments must be turned in on Gradescope.

Homework

There will be four homework assignments over the course of the semester, to be distributed in class. You are allowed to work with other students on the homework problems, but the work that you turn in should be your own. Homework problems will be graded for correctness.

Please keep in mind that **no late homework will be accepted.** Homework assignments must be turned in on Gradescope.

Exams

There will be two exams for this course: a midterm exam on 16 July and a final exam on 6 August. The midterm exam will cover all material taught up until that point, and the final exam is cumulative over all topics covered in the semester. **There will be no make-up exams.**

Grades

There are 400 possible points in the course, broken down as follows:

Assignment	**Points Possible**
Midterm Exam:	100 points
Final Exam:	100 points
Homework:	100 points (25 points each $\times$ 4 assignments)
Reading Assignments:	80 points (5 points each $\times$ 16 assignments)
Participation:	20 points (5 points office hours visit, 15 points other)
Total:	400 points

Your final grade will be determined based on your point total out of 400. The letter grade cutoffs below will be used as a guideline; they will not be raised but they may be lowered.

Final Grade:	A	B	C	D	F
Points Interval:	[360,400]	[320, 360)	[280, 320)	[240, 280)	[0, 240)

Additional Information

Extra Help

If you need help outside of class and office hours, math tutors are available from 7:00pm - 9:30pm Sundays through Thursdays in 2165/2166 in Balch Hall.

Students with Disabilities

Your access to this course is very important. Please give me your Student Disability Services (SDS) accommodation letter early in the semester so that we have adequate time to arrange your approved academic accommodations. If you need an immediate accommodation for equal access, please speak with me after class email me and/or SDS at sds_cu@cornell.edu. If the need arises for additional accommodations during the semester, please contact SDS.

Student Disability Services is located in Cornell Health Level 5, 110 Ho Plaza. Staff can be reached by phone at 607.254.4545 or by email at sds_cu@cornell.edu.

Academic Integrity Policy

Each student is expected to abide by the Cornell University Code of Academic Integrity. In this course, as stated above, you may work in groups on the homework, but the solutions you hand in should be your own write-up. If there is clear evidence that a student has committed fraud (e.g. cheating on an exam or quiz), your instructor will be obliged to deal with the matter in accordance with the Code. For more information, visit:

http://cuinfo.cornell.edu/aic.cfm

SCHEDULE

This schedule is subject to change.

Date	In-class	Due	Notice
25 June	Introduction, §5.2, §5.3	Visit office hours	
26 June	Recitation	Reading 1	
27 June	§5.4, §5.5	Reading 2	Drop deadline with tuition refund
28 June	§5.6, §5.7	Reading 3	
29 June	Recitation		
2 July	§6.1, §6.2	Reading 4	
3 July	Recitation	HW1	
4 July	*No Class*		Happy Independence Day!
5 July	§6.3, §6.4	Reading 5	Deadline to change grade option
6 July	Recitation		
9 July	§6.5	Reading 6	
10 July	Recitation		
11 July	§8.1, §8.2	Reading 7	
12 July	§8.3, §8.5	HW2, Reading 8	
13 July	Review		Drop deadline without a 'W'
16 July	**Midterm Exam**		
17 July	§9.1	Reading 9	
18 July	§8.7, §8.8	Reading 10	
19 July	Recitation		
20 July	§8.9	Reading 11	
23 July	§11.1, 11.2	Reading 12	
24 July	Recitation	HW3	
25 July	§11.3	Reading 13	
26 July	§11.4	Reading 14	
27 July	Recitation		
30 July	§11.5	Reading 15	
31 July	Recitation		
1 August	§11.6, §11.7	Reading 16	
2 August	Review	HW4	
3 August	Review		
6 August	**Final Exam**		