

MAC 2311: CALCULUS 1

FALL 2017

Contact Information:

Instructor

Name: Dr. Kevin Knudson

Office: Little 365

Office Hours: M4, T4, F5

Phone: 352-294-2389

Email: kknudson@ufl.edu

Course homepage is on Canvas, <https://elearning.ufl.edu>.

Teaching Assistant

Name:

Office:

Office Hours:

Phone:

Email:

1. INTRODUCTION

1.a COURSE CONTENT: MAC2311 is the first in the three-semester sequence MAC2311, MAC2312, MAC2313 covering the basic calculus. Intended topics will include limits, differentiation, applications of the derivative and introduction of integration. This section of the course will also include applications of calculus to problems in various fields of engineering.

A minimum grade of C (not C–) in MAC2311 satisfies four credits of general education requirement and also satisfies the pure math portion of the state Writing/Math requirement.

1.b PREREQUISITES: MAC2311 assumes that you have essential precalculus skills (both algebra and trigonometry) necessary to succeed in calculus. Students should be able to do arithmetic without a calculator.

To enroll in MAC2311, you must have earned a grade of C or better in MAC1147 (or its equivalent, both MAC1140 and MAC1114), earned calculus credit through an exam or earlier coursework, or have taken the ALEKS placement assessment and attained the required minimum score. You may take the ALEKS assessment through the ISIS homepage isis.ufl.edu; click on Placement under My Online Services. For more complete information, check the page isis.ufl.edu/aleksinfo.html. Note the following paragraph: “The Department of Mathematics encourages you to take the assessment even if you have met one of the prerequisites for MAC2311. Quite often, your algebra and trigonometry skills may need review and your placement assessment can provide information and specific areas for additional study.” You can check with an advisor in your college, the MAC2311 course coordinator, or in the main math office (Little 358) to be sure that you are eligible for MAC2311.

MAC2311 begins with a short review of precalculus topics, which you will complete on your own. **You should already be competent in working this material.** We **strongly recommend** that students who are having difficulty with the precalculus review material consider first taking MAC1147, a four credit precalculus course reviewing essential calculus skills. You may switch courses on ISIS during the drop-add period.

1.c REQUIRED MATERIALS: There are no required textbooks for this course. We will make use of a free online textbook available at <http://bit.ly/2uEmmKF>. You will need to purchase a HITT clicker from the bookstore for in-class participation. You will use this in subsequent calculus courses. Also, in this course we will pilot a new online homework system being developed at UF. This work is supported by the Office of the Provost and the College of Liberal Arts and Sciences. The platform is called Xronos and is accessible through the Canvas site. More details will be given in class.

CALCULATORS: A graphing calculator and Wolframalpha are useful as a study and learning tool when used appropriately, but they are not essential. I also recommend the online graphing calculator Desmos (www.desmos.com), and the app GeoGebra (www.geogebra.org) to help you as you learn the material, but calculus is a collection of

ideas that are not mastered through calculator skills. No calculators are allowed on quizzes or on the exams

1.d E-LEARNING CANVAS: E-learning Canvas, a UF course management system, is located at elearning.ufl.edu. Use your Gatorlink username and password to login. All course information including your grade, course homepage, syllabus, lecture outlines, office hours, test locations, mail tool, discussion forum, free help information, etc. can be accessed from this site.

You are responsible for verifying that your grades are accurate. **You have one week after a score has been posted to contact your TA if you believe there has been a recording error. There is no grade dispute at the end of the semester.**

Please note: Important course information is clearly communicated in this course guide, the MAC 2311 homepage and links in Canvas, and announcements in lecture and discussion. Due to the volume of email received by the instructor and TAs, we cannot reply to each request for this well publicized information. If you cannot find your answer in the resources above, there is also a **Discussion Forum** available in Canvas. Please use this to post questions and to supply answers to your fellow students. The instructor and TAs will check the discussion forum regularly.

1.e LECTURES: This class will take a different form than you may be used to. I will not lecture for the whole period, if at all. You will be responsible for watching pre-recorded lectures online at the course site in Canvas **BEFORE** coming to class. We will spend most of our class time working on problems and exploring the concepts of calculus in small groups. There is a lot of research showing that students learn and retain information better in this environment. Come to class ready to participate.

1.f DISCUSSION SECTIONS, which meet once a week on Tuesday, give you a valuable opportunity for open discussion of the lecture material and assigned problems in a smaller class setting. **Attendance in discussion is required as it is where assessment of your skills will take place.** However, one period per week is generally not adequate to answer all questions. Be sure to take advantage of the opportunities outside of class for additional help.

Your main resource is your discussion leader. He or she will be available during office hours (or by appointment) to answer your questions about the course material. Your TA is responsible for grading and recording all quiz scores. You must retain all returned papers in case of any discrepancy with your course grade. As mentioned above, **you should check Canvas regularly and consult with your TA if you have any questions about recorded grades. All grade concerns must be taken care of within one week of receiving the score.**

If you have concerns about your discussion class which cannot be handled by your TA please contact Dr. Knudson.

1.g FREE HELP: In addition to attending your discussion section regularly and visiting your discussion leader, lecturer or the course coordinator, during their office hours, the following aids are available.

- The Math Help Center in Little 215 is open for drop-in assistance with homework Monday through Friday from 9:30 to 4:00. It is staffed by mathematics graduate students and undergraduate assistants. Please note that this space is not designed for intense one-on-one tutoring, but rather as a resource for quick questions and explanations. You should not expect the staff to help you if you haven't at least begun your homework and have specific questions. Moreover, they absolutely will not assist you with quizzes or any other such work.
- The Teaching Center Math Lab, located at SE Broward Hall, is a tutorial service staffed by trained math and science students to provide help with your calculus questions and homework. Tutors will be glad to provide guidance on specific problems after you have attempted them on your own. You may want to attend different hours to find the tutors with whom you feel most comfortable. You can also request free one-on-one tutoring.

The math lab also offers a more structured tutoring program for MAC2311, called **supplemental instruction**. A tutor, assigned specifically to MAC 2311, provides weekly help sessions. More details will be provided in lecture.

In addition, the Broward teaching center tutors hold reviews on the evenings before each exam. They also provide videos of review and sample test problems. Check the webpage, teachingcenter.ufl.edu, for a map of the location, tutoring hours and test review dates and locations. **All students are encouraged to use the teaching center.**

- Office of Academic Support offers free one-on-one and small group tutoring sessions to any UF students. See <http://oas.aa.ufl.edu/tutoring.aspx> for details.
- Textbooks and solutions manuals are located at the reserve desks at Marston Science Library.
- Private Tutors: If after availing yourself of these aids, you feel you need more help, you may obtain a list of qualified tutors for hire at www.math.ufl.edu. Search "tutors".
- The Counseling Center has some informative information on developing math confidence. Go to <http://www.counseling.ufl.edu/cwc/DevelopingMath-Confidence.aspx> for information on math confidence and information on joining the Academic Confidence Group.

1.h SUCCESS: Other than having a strong precalculus background, success in MAC 2311 depends largely on your attitude and effort. Attendance and participation in class is critical. It is not effective to sit passively in class and let the other members of your group do the work. Students who do not actively participate have much more difficulty. However, be aware that much of the learning of mathematics at the university takes place outside of the classroom. You need to spend time reviewing the concepts of each lecture **before** you attempt homework problems. It is also important to look over the textbook sections to be covered in the next lecture to become familiar with the vocabulary and main ideas before class. As with most college courses, you should expect

to spend a **minimum** of 2 hours working on your own for every hour of classroom instruction (at least 6 hours per week).

It can also be very helpful to study with a group. This type of cooperative learning is encouraged, but be sure it leads to a better conceptual understanding. **You must be able to work through the problems on your own.** Even if you work together, each student **must turn in his or her own work, not a copied solution, on any collected individual assignments.**

REMEMBER that there are resources available as you study. We encourage you to seek help from your lecturer and TA during office hours. Please contact us for an appointment if your classes conflict with our office hours, or in the case of an emergency. As mentioned before, we also encourage you to use the Broward Teaching Center.

In studying calculus, you must be careful not to let a tutor, friend, or calculator “think” for you. Be sure that you can work problems completely on your own, without help, by the time of a quiz or exam.

Our hope is that through focused study and practice you will gain a real appreciation for the important concepts of calculus and their application. We want you to succeed in this class! But you must keep up with the course material and take the initiative to see us and get help in time, before you get too far behind. Students with a positive attitude who are intellectually engaged in learning the material will get the most from the course.

1.i STUDENTS WITH LEARNING DISABILITIES: Students requesting class and exam accommodations must first register with the Dean of Students Office Disability Resource Center(DRC), www.dso.ufl.edu/drc/. That office will provide a documentation letter via email to Dr. Knudson This must be done as early as possible in the semester, **at least one week before the first exam**, so there is adequate time to make proper accommodations.

1.j ACADEMIC HONESTY GUIDELINES: All students are required to abide by the Academic Honesty Guidelines which have been accepted by the University. The academic community of students and faculty at the University of Florida strives to develop, sustain and protect an environment of honesty, trust, and respect. Students are expected to pursue knowledge with integrity. Exhibiting honesty in academic pursuits and reporting violations of the Academic Honesty Guidelines will encourage others to act with integrity. Violations of the Academic Honesty Guidelines shall result in judicial action and a student being subject to the sanctions in paragraph XIV of the Student Code of Conduct. The conduct set forth hereinafter constitutes a violation of the Academic Honesty Guidelines (University of Florida Rule 6C1-4.017).

The Mathematics Department expects you to follow the Student Honor Code. We are bound by university policy to report any instance of suspected cheating to the proper authorities. You may find the Student Honor Code and read more about student rights and responsibilities concerning academic honesty at the link www.dso.ufl.edu/sccr/.

In addition, we remind you that lectures given in this class are the property of the University/faculty member and may not be taped without prior permission from the

lecturer and may not be used for any commercial purpose. Students found to be in violation may be subject to discipline under the Student Conduct Code.

2. GRADING

2.a EXAMS: Mid-term exam dates are as follows:

Tuesday, September 19

Wednesday, October 18

Tuesday, November 14

These exams will take place in the evening, probably from 8:30 to 10:00 pm, but exact times will be announced well in advance.

There will be a final exam on Saturday, December 9, 2017 from 5:30 to 7:30 pm. Make a note of this now and please inform any interested parties (e.g. your parents) who may be making plans for you around that time (such as purchasing plane tickets to fly home, etc.).

2.b ONLINE HOMEWORK: In this course we will pilot a new online homework system being developed by the math department at UF. This new platform, called Xronos, is free of charge and will be explained during class. Online homework assignments will be assigned daily and must be completed by the specified due date. These will count up to a maximum of 40 points, but the total number of points available is higher to offset credit lost due to technical difficulties or a missed assignment.

2.c CLASS PARTICIPATION POINTS: Up to 30 points may be earned by attendance and answering problems in class using the HITT clicker. More details will be available in class. **YOU MAY NOT SUBMIT CLICKER ANSWERS FOR A STUDENT WHO IS NOT IN CLASS** (See section 1j). **There will be extra points available to account for an occasional absence.**

Following university policy, you may expect a penalty (additional lost points) for attending fewer than 75% of your classes. In addition, you will lose the opportunity to earn additional points if available at the end of the semester.

2.d DISCUSSION QUIZZES: Each week in your discussion section you will take a short quiz on the material covered in class. These are worth 10 points each, but only the 8 highest scores will factor into your grade. These are administered and graded by your TA; any questions about the grades should be directed to him or her.

2.e MAKE-UP POLICY: All make-up work must be arranged with Dr. Knudson.

- **Exam Conflicts - UF during Term Assembly Exam Policy**

(catalog.ufl.edu/ugrad/current/regulations/info/exams.aspx):

“Exams may be held Monday – Friday from 8:20 – 10:10PM (periods E2–E3) for

the fall and spring terms. If other classes are scheduled during an exam time, instructors must provide make-up class work for students who miss class because of an assembly exam. If two exams are scheduled at the same time, assembly exams take priority over time-of-class exams. When two assembly exams conflict, the higher course number takes priority. Instructors giving make-up exams will make the necessary adjustments.”

If MAC 2311 is the lower course number, students must inform Dr. Knudson in person at least ONE WEEK in advance of the exam date so that appropriate accommodations can be made. Otherwise it may not be possible to reschedule.

- **Make-up Exams:** If you are participating in a UF sponsored event or religious observance, you may make up an exam only if you make arrangements with Dr. Knudson at least ONE WEEK PRIOR to the event. You must present documentation of a UF sponsored event.

If illness or other extenuating circumstances cause you to miss an exam, contact Dr. Knudson (no later than 24 hours after the exam) by email. Then, as soon as possible after you return to campus, bring the appropriate documentation to him in Little 365 during office hours. You will be allowed to sign up to take a makeup exam as scheduled during the semester.

- **Make-up Xronos HW:** There are no make-ups.
- **Make-up class participation points:** There are no make-ups.

2.f INCOMPLETE: Students who are currently passing a course but are unable to complete the course because of illness or emergency may be granted an incomplete grade of I which will allow the student to complete the course within the first two weeks of the following semester. See the policy on <http://www.math.ufl.edu/fac/incompletes.html>. If you meet the criteria, you must see Dr. Knudson before finals week to be considered for an I. An I only allows you to make up your incomplete work, not redo your work.

2.g GRADE CALCULATION: Your final grade will be calculated as follows:

Assignment	Points
Exam 1	80
Exam 2	80
Exam 3	80
8 Highest Quiz Scores	80
Lecture Quizzes	40
Xronos	40
Clicker	30
Final	120
Total	540

The total sum of points is your numerical score, which will be converted to a letter grade according to the following scale. **The course grade is determined by the number of points you earn, not by the percentage**, and will be strictly enforced. Scores within 0.5 of the next cutoff will round up.

There will be no additional curve in this course, and extra assignments for individual students to improve a grade are NOT possible.

A	486 - 540 pts (90%)	C	362 - 399 pts (67%)
A-	470 - 485 pts (87%)	C-*	346 - 361 pts (64%)
B+	454 - 469 pts (84%)	D+	324 - 345 pts (60%)
B	432 - 453 pts (80%)	D	308 - 323 pts (57%)
B-	416 - 431 pts (77%)	D-	292 - 307 pts (54%)
C+	400 - 415 pts (74%)	E	0 - 291 pts

***NOTE** A grade of C- DOES NOT give Gordon Rule or General Education credit!

For those taking the S-U option: S [362 - 540 points] U [0 - 361 points]

Approval of the S-U option must be obtained from your instructor. The deadline for filing an application with the Registrar and further restrictions on the S-U option are given in the Undergraduate Catalog.

For a complete explanation of current policies for assigning grade points, refer to the UF undergraduate catalog:

catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

NOTE: We will not review disputed points at the end of the semester. All grade concerns must be settled within one week of the return of the paper.

PREREQUISITES FOR MAC2311

This course assumes that you have a sound precalculus background. The following is a summary of some important concepts used in solving calculus problems. The appendices in the text provide a more complete review of these essential topics.

ALGEBRA

1. Basic Geometric Formulas: (b = base, l = length, h = height, w = width)

Triangle: area = $\frac{1}{2}bh$

Circle: area = πr^2 ; circumference = $2\pi r$

Parallelogram: area = bh

Rectangular box: volume = lwh

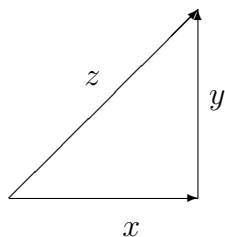
Sphere: volume = $\frac{4}{3}\pi r^3$; surface area = $4\pi r^2$

Right circular cylinder: volume = $\pi r^2 h$; surface area = $2\pi r h + 2\pi r^2$

Right circular cone: volume = $\frac{1}{3}\pi r^2 h$; surface area = $\pi r \sqrt{r^2 + h^2}$

Facts about similar triangles

Pythagorean theorem: $x^2 + y^2 = z^2$



2. Basic Functions and their graphs:

$$f(x) = x; f(x) = x^2; f(x) = x^3; f(x) = |x|; f(x) = \sqrt{x}; f(x) = 1/x;$$

$$f(x) = b^x, b > 0 \text{ and } b \neq 1, \text{ such as } f(x) = 2^x$$

3. Factoring:

$$x^3 + y^3 = (x + y)(x^2 - xy + y^2); x^3 - y^3 = (x - y)(x^2 + xy + y^2); \text{ etc.}$$

4. Fractions: $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$, etc.

5. Exponents: $x^n y^n = (xy)^n$; $x^n x^m = x^{n+m}$;

$$\frac{x^n}{x^m} = x^{n-m}; (x^n)^m = x^{nm}$$

6. Roots, including rationalizing the denominator or numerator.

$$\sqrt[n]{x} = x^{\frac{1}{n}}; x^{-n} = \frac{1}{x^n}, \text{ etc.}$$

7. Inequalities and absolute values:

$$|x| \leq a \quad -a \leq x \leq a; \quad |x| > a \quad x > a \text{ or } x < -a$$

8. Equation solving: Finding solutions for x if

$$ax + b = 0; ax^2 + bx + c = 0; \text{ etc.}$$

9. Logarithms: $\log_a x = y$ if and only if $x = a^y$

$$\log(nm) = \log(n) + \log(m) \quad \log\left(\frac{n}{m}\right) = \log(n) - \log(m)$$

$$\log(n^c) = c \log(n)$$

TRIGONOMETRY

1. Identities:

$$\begin{array}{lll} \sin(-\theta) = -\sin \theta & \cos(-\theta) = \cos \theta & \tan(-\theta) = -\tan \theta \\ \sin\left(\frac{\pi}{2} - \theta\right) = \cos \theta & \cos\left(\frac{\pi}{2} - \theta\right) = \sin \theta & \tan\left(\frac{\pi}{2} - \theta\right) = \cot \theta \\ \sin^2 \theta + \cos^2 \theta = 1 & \sec^2 \theta = 1 + \tan^2 \theta & \csc^2 \theta = 1 + \cot^2 \theta \end{array}$$

2. Sum and Difference Formulas:

$$\begin{array}{l} \sin(A \pm B) = \sin A \cos B \pm \cos A \sin B \\ \cos(A \pm B) = \cos A \cos B \mp \sin A \sin B \\ \tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B} \end{array}$$

3. Double Angle Formulas:

$$\begin{array}{l} \sin 2\theta = 2 \sin \theta \cos \theta \\ \cos 2\theta = \cos^2 \theta - \sin^2 \theta = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta \end{array}$$

4. Half-Angle Formulas:

$$\sin^2 \theta = \frac{1 - \cos 2\theta}{2} \quad \cos^2 \theta = \frac{1 + \cos 2\theta}{2}$$

4. Trigonometric Values:

θ	0	$\pi/6$	$\pi/4$	$\pi/3$	$\pi/2$
$\sin \theta$	0	1/2	$\sqrt{2}/2$	$\sqrt{3}/2$	1
$\cos \theta$	1	$\sqrt{3}/2$	$\sqrt{2}/2$	1/2	0
$\tan \theta$	0	$\sqrt{3}/3$	1	$\sqrt{3}$	undef