

MAC 2311.A: Analytic Geometry & Calculus 1

Course Coordinator

Name: Mr. Josh Slatton
Office: Little 435
Email: jhslatton@ufl.edu

UF Flexible Learning Contact Information:

Email: learn@dce.ufl.edu
Phone: (352) 392-1711
Toll free: (800) 327-4218
Fax: (352) 392-6950
Website: <http://flexible.dce.ufl.edu>

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1. INTRODUCTION

1a. COURSE CONTENT: MAC 2311 is the first in the three-semester sequence MAC 2311, MAC 2312, MAC 2313 covering basic calculus. Intended topics will include limits, differentiation, applications of the derivative and introduction of integration.

A minimum grade of C (not C-) in MAC 2311 satisfies four credits of general education requirement and also satisfies the pure math portion of the state Writing/Math requirement.

This is an ONLINE VERSION of MAC 2311 - all content is delivered online. Students view 32 online lectures and complete lecture quizzes in the course management system Canvas, and complete online homework and quizzes using WebAssign. Three semester exams and a final are posted in Canvas and administered through ProctorU.

1b. PREREQUISITES: MAC 2311 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 MAC 2311, you must have earned a grade of C or better in MAC 1147 (or its equivalent, both MAC 1140 and MAC 1114), earned 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 One.UF homepage one.uf.edu; click on Access in the Student Self Service box. The ALEKS assessment is under the Placement tab on the left. For more complete information, check the page student.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 MAC 2311. 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 or the MAC 2311 course coordinator to be sure that you are eligible for MAC 2311.

MAC 2311 begins with a short review of precalculus topics including a short diagnostic test in WebAssign. **You should already be competent in working this material.** We strongly recommend that students who are having difficulty with the precalculus review material should consider first taking MAC 1147, a four credit precalculus course reviewing essential calculus skills.

1c. REQUIRED MATERIALS:

Textbook: Calculus: Early Transcendentals, Second Edition by Rogawski. ISBN-10: 1-4292-0838-4; ISBN-13: 978-1-4292-0938-3. You may use either the printed version of the textbook or the online e-textbook. A hard copy of the textbook and solutions manual are *not* required. WebAssign enrollment for online homework is required. **Please note, there is no trial grace period for WebAssign. You must purchase an access code to use it.**

We recommend two pricing options for WebAssign:

- \$85 single term access to e-book and online homework
- \$50 single term access to online homework (only if you have already purchased the textbook)

Computer access and requirements: All assignments should be taken on a computer, not cell phone or tablet, since there may be compatibility issues with Canvas and WebAssign. Be sure you are using a browser that works with WebAssign. Please check for WebAssign browser recommendations. Any WebAssign questions should be directed to your instructor and/or the WebAssign Student Support, <https://webassign.com/support/student-support/>.

Calculators: A graphing calculator and Wolframalpha are useful as a study and learning tool when used appropriately, but they are not essential. **Remember that Calculus is a collection of ideas that are not mastered through calculator skills. No calculators are allowed on exams.**

1d. E-LEARNING IN CANVAS: UF Online's course management system is accessed through elearning.ufl.edu. Use your Gatorlink username and password to login. All course information, including the course homepage, syllabus, and exam information are posted on this site. In addition, there is a mail tool for communication.

All grades are posted in Canvas (except individual WebAssign homework and quiz scores, which are accessed in your WebAssign gradebook). You are responsible for verifying that those grades are accurate. **You have one week after a score has been posted to resolve any grade concerns by contacting the course instructor. We will not consider these grade disputes at the end of the course term.**

1e LECTURE VIDEOS: The lecture videos provide the main presentation of course material, and are accessed through the Canvas modules. **You should watch the lectures and answer the corresponding Lecture Quiz Questions before attempting the homework.** You may contact your instructor if you need clarification of a topic.

1f SUCCESS: Other than having a strong precalculus background, success in MAC 2311 depends largely on your attitude and effort. It is not effective to watch a video and copy notes without following the thought processes involved in the lecture. For example, you should try to answer the questions posed by your lecturer. Students who do not actively participate have much more difficulty. For that reason there are lecture quiz questions included in each lecture which you will answer in Canvas as part of your final grade.

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 from the videos and textbook **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 watching the video. That way you will better be able to grasp the lecture material. 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.

It is critical that you keep pace with the course material as presented in the module for each week. Do not fall behind. Email your instructor if you have questions. Do not let misunderstanding go unanswered.

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! But you must keep up with the course material and take the initiative to get help 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.

1g STUDENTS WITH LEARNING DISABILITIES: The Disability Resource Center in the Dean of Students Office provides students and faculty with information and support regarding accommodations for students with disabilities. Staff at the Disability Resource Center will assist any students who registers as having a disability. Official documentation of a disability is required to determine eligibility for appropriate accommodations. The professional employees at the Disability Resource Center serve as full-time advocates for students with disabilities ensuring students have physical and programmatic access to all college programs. One of the services provided by the Disability Resource Center includes:

- Test Accommodations

Please click on this link for further information:

<https://www.dso.ufl.edu/drc/students/accommodations/testing-accommodations>

Here is the link to register with the DRC: <https://www.dso.ufl.edu/drc/>

The Flexible Learning Office needs to be notified of any special accommodations required by the student when they begin their course by emailing the Accommodations Letter to lessons@dce.ufl.edu.

1h ACADEMIC HONESTY: Remember that you committed yourself to academic honesty when you registered at the University of Florida by agreeing to the Honor Pledge below:

The Honor Pledge

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity by abiding by the Honor Code.

On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

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 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 lecture videos are the property of the University/faculty member 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.

1i PLAGIARISM: “A student shall not represent as the student’s own work all or any portion of the work of another. Plagiarism includes but is not limited to:

1. Quoting oral or written materials including, but not limited to, those found on the internet, whether published or unpublished, without proper attribution.
2. Submitting a document or assignment which in whole or in part is identical or substantially identical to a document or assignment not authored by the student.”

Source: Regulations of the University of Florida, UF-4.041. For more information, please go to this link: <http://regulations.ufl.edu/wp-content/uploads/2012/09/4041.pdf>

“For a violation or violations of the Honor Code, a student may receive any of the sanctions that can be imposed for Student Conduct Code violations, including but not limited to conduct probation, suspension and expulsion as well as any educational sanctions. In addition, students may receive the following:

(a) Assignment grade penalty. The student is assigned a grade penalty on an assignment including but not limited to a zero.

Course grade penalty. The student is assigned a grade penalty in the entire course including but not limited to an E.”

Source: <http://regulations.ufl.edu/wp-content/uploads/2012/09/4047.pdf>

2. TESTING

2a SEMESTER EXAMS: During the semester, three test will be given. The exams will be given in Canvas and administered through ProctorU. You will take the exam in a 100 minute time slot. **You must register with ProctorU** at <http://go.proctoru.com> for each exam at least 72 hours in advance. A computer with a webcam and built in microphone is required for the exams and a hard-wired, high speed Internet connection is recommended. See the ProcturU Student Handout located in the “Start

here” section of your course for the instructions and technical requirements or test your equipment at <http://www.proctoru.com/testitout/> before you enroll in the course. Each exam will be scored on a scale of 0 to 100 points. In addition, there will be 10 bonus points built into each exam. No books, notes, cell phones, iPads, calculators, etc., allowed during the exam.

2b FINAL EXAM: A mandatory, comprehensive final examination will be given. You will need to register with ProctorU at least 72 hours in advance to schedule a 130 minute time block.

IMPORTANT: You may use your final exam score to replace your score for one of the three semester exams if the grade is higher.

Note: You may not use a calculator or any other study aid for exams. Be sure to read the ProctorU handout thoroughly to understand the exam procedures before you start a test.

3 GRADING

3a COURSE GRADE: Your course grade is based on 600 points accumulated as follows:

10 WebAssign Quizzes (best 10 of 12)	100
WebAssign Assignments	60
Lecture Quizzes	40
3 Semester Exams	300
Final Exam	100

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 to improve a grade are NOT possible.

A	540 – 600 pts (90%)	C	400 – 439 pts (67%)
A-	520 – 539 pts (87%)	C-*	380 – 399 pts (64%)
B+	500 – 519 pts (84%)	D+	360 – 379 pts (60%)
B	480 – 499 pts (80%)	D	340 – 359 pts (57%)
B-	460 – 479 pts (77%)	D-	320 – 339 pts (54%)
C+	440 – 459 pts (74%)	E	0 – 319 pts

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

For those taking the S-U option: S[400-600 points] U [0-399 points]

Approval of the S-U option must be obtained from your coordinator.

The University of Florida assures the confidentiality of all your educational records in accordance with

State University System Rules, State Statutes, and the Family Educational Rights and Privacy Act. **Grades are not given out over the phone.**

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

3b VIDEOS and LECTURE QUIZZES: Viewing the lecture presentations is an important aspect of the learning process. Videos are accessed through the modules in Canvas. There are 2-3 lecture quiz questions to be completed with each lecture and you have 2 tries per each lecture quiz. You may earn up to 40 points by completing lecture quizzes.

You should work these problems as you watch the lectures and then enter your answers directly in Canvas. We encourage you to use the text as well as the videos to help answer these questions.

3c WEBASSIGN ONLINE HOMEWORK: The online homework administered on WebAssign is planned to review concepts and provide practice of the lecture material. There are 12 sets of online homework assignments during the semester. Your total score on online homework assignments will count up to a maximum 60 points, but the total number of points available is higher to offset credit lost due to technical difficulties.

The homework problems are graded by WebAssign and you see your score immediately after submitting your work. You will have multiple attempts for each problem. There are also aids and a link to the ebook to help you solve each question.

3d WEBASSIGN ONLINE QUIZZES: Twelve quizzes will be posted in WebAssign. You will have 45 minutes to complete an online quiz; the clock starts from the time you open your quiz. Each quiz will be graded on a scale of 0 to 10 points, and the top ten scores will count, to total up to 100 points.

Like an in class quiz, you will not know if your answers are correct when you take a quiz and you will not see any results until after you are finished. When you finish, you may see your quiz scores and review the questions missed in the WebAssign gradebook.

NOTE: WebAssign Homework, quizzes, and Lecture Quizzes account for 200 points of the total to be earned in the course. They are a significant part of your grade, to reflect their importance in understanding course concepts.

3e EXTRA CREDIT: You may earn additional points in the following ways:

- SYLLABUS QUIZ (3 points): In Canvas, you will find the Start Here page. Watch the introductory video and read the syllabus. After you feel comfortable with the course policies listed, take the syllabus quiz posted in Canvas for extra credit.
- PRECALCULUS DIAGNOSTIC TEST (5 points): This test provides a review of precalculus skills. It is posted in WebAssign.

- **EXAM PREPARATION (12 points):** An Exam Review will be posted in Canvas for each of the three semester tests and the final exam. The review will include questions from previous MAC 2311 exams so that you will have a flavor of the type of questions that you will see on the actual test. Detailed instructions for earning extra credit will be posted with the exam reviews.

3f COURSE DEADLINE AND EXTENSION POLICY: Each student's Flexible Learning course expires **16 weeks from the date of enrollment**. The course should be started as soon as the course materials are received since the course has already begun. It is important that the student submits their coursework on a consistent basis in order to complete the course **before** the course expiration date.

Each student is allowed 16 weeks to complete a course. If the time is about the expire and the course has not been completed, the student will be assigned a failing grade (E). If the student has made sufficient academic progress, which is defined as completing at least 50% of the course, the student may petition the instructor for a course extension. After the student has contacted the instructor for an extension, each extension request will be administratively evaluated. Instructors are **not** required to allow extensions.

3g DROPPING OR WITHDRAWING FROM A COURSE: A tuition refund may be granted after a student submits a written request for withdrawal from a course within 30 days of enrollment. This request must be in writing and may be sent by fax (352 – 392 – 6950) or email (learn@dce.ufl.edu). All requests will receive written responses. Refunds will be the amount of tuition, less \$25.00 per course. If a credit card was used to pay for tuition, the refund will be in the form of credit to that card. A refund can be issued on course materials at the time of withdrawal if they are returned within 30 days of sale and are in their original condition. Allow 6-8 weeks for refund checks. **No refunds are granted after 30 days.** Students with disabilities who need to drop a course due to disability-related reasons are allowed to petition for additional drops. For more information, contact the Disability Resource Center at <https://www.dso.ufl.edu/drc>.

Attention UF Students:

- In order to drop a UF Flexible Learning course, UF students must have an Academic Advisor or Department Chair email the UF Flexible Learning Office at learn@dce.ufl.edu stating that the student is approved to drop the course. Students must also notify the UF Flexible Learning Office of this request by emailing learn@dce.ufl.edu. Use this link for more information: <https://catalog.ufl.edu/current/regulations/info/drops.aspx#drop>
- UF Students wishing to drop a UF Flexible Learning course after drop/add should contact their college advising office to see if they have a free drop remaining. If they have a free drop remaining, they have 14 weeks from the date of enrollment to drop the course, subject to applicable rules of their college and the university. This action is subject to verification that a grade has not yet been assigned.
- All full-term withdrawals must follow University of Florida policies/procedures. An approved withdrawal form must be submitted to the Dean of Student's office for review and final approval. Students must also notify the UF Flexible Learning Office of this request by emailing learn@dce.ufl.edu. Use this link for more information: <https://catalog.ufl.edu/ugrad/current/regulations/info/drops.aspx#withdraw>

Medical Withdrawals: Here is the link to start the Medical Withdrawal Process:

<https://www.dso.ufl.edu/care/medical-withdrawal-process/>

Retroactive Withdrawals: Here is the link for retroactive withdrawal information:

<http://www.registrar.ufl.edu/currents/petitioninstructs.html>

The student needs to notify the Flexible Learning Office of their approved medical or retroactive withdrawal so that we can update their record in our office by emailing a copy of the approval to learn@dce.ufl.edu.

Transfers: You may transfer from one course to another within 30 days of enrollment. This request must be in writing and sent by fax (352-392-6950) or email (learn@dce.ufl.edu). You will receive a receipt by mail. Any difference in tuition will be collected or refunded. There is a \$50.00 transfer fee. After the transfer has taken place, the original enrollment and expiration dates will apply. The approval of a dean or academic advisor is required for UF students, which needs to be emailed to learn@dce.ufl.edu or faxed to 352-392-6950.

Book Buy-Back Policy: Textbooks purchased from the UF Flexible Learning Bookstore, except for ones with an access code, which are in continued use by UF Flexible Learning and are in good condition may be repurchased at 50% of the original purchase price 30 days from completion of, or withdrawal from, a course. Contact UF Flexible Learning for more details at 1-800-327-4218.

3h HOW TO REQUEST A UF TRANSCRIPT: There are two ways to order a transcript:

1. The online ordering system by going to this link: <http://www.registrar.ufl.edu/transcript.html>
2. If you cannot use the online system, please contact the UF Office of the University Registrar for instructions to mail in a request with a check or money order. They can be contacted by phone Monday-Friday, 8:00 a.m. to 5:00 p.m. at 352-392-1374. Persons with hearing impairments can call FRS # 1-800-955-8771 (TDD).

Please check your “unofficial transcript” first, before ordering your “official transcript”, to make certain that your grade has been posted.

4 GENERAL EDUCATION INFORMATION:

MAC 2311 has been designated a General Education course that can be counted towards the Mathematical Science (M) requirement.

Course Objective - The General Education Objectives for Mathematics courses:

“Courses in mathematics provide instruction in computational strategies in fundamental mathematics including at least one of the following: solving equations and inequalities, logic, statistics, algebra,

trigonometry, inductive and deductive reasoning. These courses include reasoning in abstract mathematical systems, formulating mathematical models and arguments, using mathematical models to solve problems and applying mathematical concepts effectively to real-world situations.”

The primary goal of the course is to help students understand and apply the fundamental principles of differential and integral calculus. These objectives are accomplished through the lectures, homework, quizzes and discussion sections.

Student Learning Outcomes (SLOs) - The general education student learning outcomes describe the knowledge, skills and attitudes that students are expected to acquire while completing a general education course at the University of Florida.

I. Content: Content is knowledge of the concepts, principles, terminology and methodologies used within the discipline.

- Understand the fundamental concept of limit.
- Understand the definition of the derivative and be competent at calculating derivatives using the product, quotient, and chain rules.
- Understand the definition of the definite integral via Riemann sums and gain competence in evaluating them directly from the definition.

II. Communication: Communication is the development and expression of ideas in written and oral forms. Students communicate knowledge, ideas, and reasoning clearly and effectively in written and oral forms appropriate to the discipline.

- Communicate mathematical findings clearly and effectively using written and/or graphic forms.

III. Critical Thinking: Critical thinking is characterized by the comprehensive analysis of issues, ideas, and evidence before accepting or formulating an opinion or conclusion. Students analyze information carefully and logically from multiple perspectives, using discipline-specific methods, and develop reasoned solutions to problems.

- Apply techniques of derivatives and critical thinking effectively to solve applied problems including related rates and optimization problems.
- Analyze properties of functions using derivatives including regions of increase/decrease, inflection points, local maxima/minima.
- Apply the Fundamental Theorem of Calculus to the evaluation of definite integrals and understand the link between differentiation and integration.

These SLOs are assessed through weekly homework assignments and quizzes, three semester exams, and final exams.

5. ONLINE COURSE EVALUATION

Students are asked to provide feedback on the quality of instruction in this course by completing an online evaluation at <https://evaluations.ufl.edu>.

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 textbook provides a more complete review of these essential topics.

ALGEBRA

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

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

$$\text{Circle: area} = \pi r^2; \quad \text{circumference} = 2\pi r$$

$$\text{Parallelogram: area} = bh$$

$$\text{Rectangular box: volume} = lwh$$

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

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

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

Facts about similar triangles:

$$\text{Pythagorean theorem: } x^2 + y^2 = z^2$$

2. Basic Functions and their graphs:

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

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

3. Factoring:

$$x^3 + y^3 = (x + y)(x^2 - xy + y^2)$$

$$x^3 - y^3 = (x - y)(x^2 + xy + y^2)$$

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.

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

7. Inequalities and absolute values:

$$|x| \leq a \quad -a \leq x \leq a;$$

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

8. Equation solving: Finding solutions for x if

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

9. Logarithms: If $x > 0$, $\log_a x = y$ if and only if $x = a^y$

If $m > 0$ and $n > 0$, then

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

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

TRIGONOMETRY

1. Identities

$$\sin(-\theta) = -\sin \theta$$

$$\cos(-\theta) = \cos \theta$$

$$\tan(-\theta) = -\tan \theta$$

$$\sin\left(\frac{\pi}{2} - \theta\right) = \cos \theta$$

$$\cos\left(\frac{\pi}{2} - \theta\right) = \sin \theta$$

$$\tan\left(\frac{\pi}{2} - \theta\right) = \cot \theta$$

$$\sin^2 \theta + \cos^2 \theta = 1$$

$$\sec^2 \theta = 1 + \tan^2 \theta$$

$$\csc^2 \theta = 1 + \cot^2 \theta$$

2. Sum and Difference Formulas:

$$\sin(A \pm B) = \sin A \cos B \pm \cos A \sin B$$

$$\cos(A \pm B) = \cos A \cos B \mp \sin A \sin B$$

$$\tan(A \pm B) = \frac{\tan A \pm \tan B}{1 \mp \tan A \tan B}$$

3. Double Angle Formulas:

$$\sin 2\theta = 2 \sin \theta \cos \theta$$

$$\cos 2\theta = \cos^2 \theta - \sin^2 \theta = 2 \cos^2 \theta - 1 = 1 - 2 \sin^2 \theta$$

4. Half-Angle Formulas:

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

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

5. 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