

MAC 2311: CALCULUS 1

SPRING 2015

Contact Information:

Course Coordinator

Name: Dr. Shu-Jen Huang

Office: 372 Little Hall

Office Hours: M4, W6, F5

Phone: 352-294-2309

Email: huang@ufl.edu

The course homepage is located in e-Learning Sakai, <https://lss.at.ufl.edu>.

Co-coordinator

Name: Mrs. Jane Smith

Office: 378 Little Hall

Phone: 352-294-2333

Email: jysmith@ufl.edu

Course Lecturer

Name: _____

Office: _____

Office Hours: _____

Phone: _____

Email: _____

Discussion Leader (TA)

Name: _____

Office: _____

Office Hours: _____

Phone: _____

Email: _____

MAC2311 – Calculus 1

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MAC 2311 Calendar, Spring 2015

Monday	Tuesday	Wednesday	Thursday	Friday
Jan 5	6 First Tuesday Discussion Class	7 L1	8 First Thursday Discussion Class	9 L2
12 L3	13 Quiz 1 (L1-L2)	14 L4	15 Quiz 1 (L1-L3)	16 L5
19 MLK Day No Class	20 Quiz 2 (L3-L4)	21 L6	22 Quiz 2 (L4-L5)	23 L7
26 L8	27 Quiz 3 (L5-L7)	28 L9	29 Quiz 3 (L6-L8)	30 L10
Feb 2 L10/L11	3 Quiz 4 (L8-L9)	4 L11	5 Quiz 4 (L9-L10)	6 L12
9 Review	10 Discussion Class (L10-L11) Exam 1*	11 L13	12 Discussion Class (L11-L12)	13 L14
16 L15	17 Quiz 5 (L12-L14)	18 L16	19 Quiz 5 (L13-L15)	20 L17
23 L18	24 Quiz 6 (L15-L17)	25 L19	26 Quiz 6 (L16-L18)	27 L20
Mar 2-6 Spring Break				
9 L20/L21	10 Quiz 7 (L18-L20)	11 L21	12 Quiz 7 (L19-L20)	13 L22
16 L23	17 Discussion Class (L21-L22)	18 Review Exam 2*	19 Discussion Class (L21-L22)	20 L24
23 L25	24 Quiz 8 (L23-L24)	25 L26	26 Quiz 8 (L23-L25)	27 L27
30 L28	31 Quiz 9 (L25-L27)	Apr 1 L28/L29	2 Quiz 9 (L26-L27)	3 L29
6 L30	7 Quiz 10 (L28-L29)	8 L31	9 Quiz 10 (L28-L29)	10 L32 Drop/withdraw deadline: 5PM
13 Review Exam 3*	14 Discussion Class (L30-L32)	15 L33	16 Quiz 11 (L30-L32)	17 L34
20 L35	21 Quiz 11 (L32-L34)	22 L35/Review	23 Reading Day No Class	24 Reading Day No Class

Cumulative Final Exam: Saturday, April 25, 5:30 – 7:30PM.

***Evening Testing Times: 8:30-10:00PM. See Sakai for test locations.**

2. INTRODUCTION

2a COURSE CONTENT: MAC 2311 is the first in the three-semester sequence MAC 2311, MAC 2312, MAC 2313 covering the 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 the university General Education Math requirement.

2b 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 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 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, the MAC 2311 course coordinator, or in the main math office (Little 358) to be sure that you are eligible for MAC 2311.

MAC 2311 begins with a short review of precalculus topics. **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 MAC 1147, a four credit precalculus course reviewing essential calculus skills. You may switch courses on ISIS during the drop-add period. In an agreement with the registrar’s office, you have one additional week to drop back to MAC 1147. **After the drop-add period, the paperwork to move back to precalculus MAC 1147 must be completed through the math department. The deadline is Tuesday, January 20 at 4PM.** See the course coordinator, Dr. Huang, in Little 372 for details.

2c REQUIRED MATERIALS :

Textbook – Calculus: Early Transcendentals, 2nd edition by Rogawski. The text may be accessed as an ebook by purchasing the **required WebAssign access code** from local bookstores or online at www.webassign.net. WebAssign will start enrollment on January 13 and you have a two week grace period to use WebAssign before you must pay for access. Details will be provided in class and on the MAC 2311 E-Learning homepage.

It is not required, but some students prefer a hard copy of the text. If so, you may purchase from local bookstores a bundle which includes both the text and WebAssign access code. Feel free instead to buy a used text online, but we do not recommend

that you purchase an access code online except through the WebAssign website since it may be defective.

Other Required Materials: As indicated, you must purchase an access code for WebAssign, which will include the text as an ebook.

In addition, we will use the **H-ITT** class responder system (“clicker”) to allow students to participate in lecture. Information will be provided in class and on the MAC2311 homepage.

Calculators: A graphics calculator and Wolframalpha can be useful study and learning tools when used appropriately, but are not essential. Calculus is a collection of ideas that are not mastered through calculator skills. No calculators are allowed on quizzes or on the exams

2d E-LEARNING SAKAI: E-learning Sakai, a UF course management system, is located at lss.at.ufl.edu. Use your Gatorlink username and password to login. All course information including homework assignments, lecture outline, office hours and test locations and reviews are posted on this site. Sakai provides a mail tool and discussion forum for communication.

All grades are posted in the Sakai gradebook (except individual WebAssign and HITT points, which are accessed through those programs). You are responsible for verifying that those grades are accurate. **You have one week after a score has been posted to contact your TA to resolve any grade concerns. We will not consider these grading disputes at the end of the semester. Be sure to save all original documents in case of grading questions.**

Please note: Important course information is clearly communicated in this syllabus and the MAC 2311 homepage in Sakai. We will update with announcements both in lecture and through Sakai. **Check regularly for announcements which are also sent to your email so you can check easily on your smartphone.** Due to the volume of email your instructors receive, we cannot reply to each request for information that is already posted online. So always check those resources first.

There is a **discussion forum** in Sakai. Please use this to post questions and to supply answers to your fellow students. Your instructors will check the discussion forum regularly and respond to questions as a way to communicate to the whole class.

2e LECTURES: The lecture provides the main presentation of course material, and will follow as closely as possible the calendar and lecture outline provided in this guide. **Attendance in lecture is required.** You are responsible for learning lecture material missed due to an excused absence. Please be on time to class, and if you must leave early, sit in the back of the lecture hall. When your lecturer or a fellow student is talking to the class, please do not talk to your neighbor. Even in a large lecture hall this can disturb students around you so they cannot concentrate.

Students can print out the lecture noteshells from Sakai through **Course Materials** link. You may also purchase a hard copy from Target Copy Center. Within a day after class, worked out solutions to the lecture examples will be available to copy on the door of Little 372, Monday through Friday from 8AM - 4:30PM. You may use your smart phone to take a picture of completed notes.

2f DISCUSSION SECTIONS, which meets once a week (either Tuesday or Thursday, depending on the section in which you are registered) gives you a valuable opportunity for open discussion of the lecture material and assigned problems in a smaller class setting. **Attendance in discussion is required**; a significant portion of the points that determine your grade in the course are earned in your discussion class. 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 person is your discussion leader, a teaching assistant (TA) in the mathematics department. He or she is available during office hours (or by appointment) to answer your questions about the course material. Your TA is responsible for recording all quiz, homework, and test scores. You must retain all returned papers in case of any discrepancy with your course grade. As mentioned above, **you should check Sakai 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**. Your grade is subject to being raised or lowered if there is a recording error, computational error, bubbling error, “padding” error, etc.

If you have concerns about your discussion class which cannot be handled by your TA please contact the course coordinator, Dr. Huang, in Little 372.

2g 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 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 MAC 2311, 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.
- UF Counseling Center provides information and workshops on developing Math Confidence. The center also offers counseling support in case of issues with academics, adjusting to the stress of college life, or personal challenges. Please use this resource before you get overwhelmed! You may also speak to Dr. Huang

or an advisor in your college if you are having difficulties. You may contact the center at www.counseling.ufl.edu.

- 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 for “tutors”.

2h 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 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.

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. That way you will better be able to grasp the material presented by your lecturer. 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 8 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.**

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.

Use the 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. We also encourage you to use the Broward Teaching Center and OAS for group and private tutoring. WebAssign offers videos and other study aids

If you are having difficulty with calculus, do not get discouraged! See your lecturer or course TA right away when you have questions.

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.

2i 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 to the student to present to the course coordinator, Dr. Huang in Little 372. 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.

2j ACADEMIC HONESTY: Remember that you committed yourself to academic honesty when you registered at the University of Florida. All students are bound to

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. **This includes clicker points submitted in lecture. Each student must enter his or her own response; clicking for another student is a violation of the Academic Honesty Guidelines and will be reported.**

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.

3. TESTING

3a SEMESTER EXAMS: During the semester, three tests will be given from 8:30 – 10PM on the dates shown on the calendar in this guide. These will be scored on a scale of 0 to 80 points and will consist of both a multiple-choice section and a free response, partial credit section (tearoff sheet).

3b FINAL EXAM: A mandatory, comprehensive final examination will be given during the regularly scheduled exam time for MAC 2311 as shown on the calendar and the online Schedule of Courses. This two hour exam is scored on a scale of 0 to 80 and consists of multiple choice questions only (no tearoff sheet). The registrar's office determines which exam has priority in the case of a conflict.

We allow the final exam score to improve your grade on one of the semester exams. That is, if your final exam grade is higher than the lowest of your three semester exam scores, its score will replace that lowest test.

Missing a final exam due to negligence, however, will result in a minimum 10-point penalty.

3c IMPORTANT EXAM POLICIES: MAC 2311 requires that students take evening exams on the listed dates. There are no exceptions to this. Students with conflicts, including regularly scheduled classes, must make advance arrangements to be present at the test.

The following applies to all exams:

(1) Students are responsible for material covered in lectures, reading assignments, and text problems. Questions will test mastery of concepts and include challenging calculation problems. **A command of related algebraic and trigonometric concepts is assumed** (see the Prerequisites, page 13, in this guide). Sample tests are available from the Teaching Center one week before each exam.

(2) Bring only the following to the exam:

- Soft lead graphite pencils (number 2 lead or softer) for bubbling your scantron
- Ink Pen (To sign your test)
- Knowledge of your SECTION NUMBER and UF ID number
- Picture ID (UF Gator One card or your state driver's license) with a **legible signature**

DO NOT BRING ANYTHING OF VALUE TO THE EXAM, since all backpacks must remain at the front of the exam room during testing. Do not bring books or other aids; scratch paper is provided. **No calculators are permitted. Cell phones and other electronic devices must be turned off and out of sight. If any such device rings, buzzes, or otherwise causes a distraction during the exam, your test will be considered to be compromised.**

(3) Students should be at the exam location at least 10 minutes early. No student will be admitted to the test later than 15 minutes after its starting time, and no one will be permitted to leave the exam room in those first 15 minutes.

- (4) The **Test Form Code**, as well as **your UFID**, name, and section number must be encoded correctly or you will lose 3 points. You must also take the test in your assigned test location or you will lose 3 points on your test.
- (5) An answer key will be posted on Sakai within one day after each exam. To check your answers, record them on the test or scratch paper that you keep after turning in your scantron and tearoff sheets.
- (6) Graded tearoff sheets will be returned in discussion. You then have **one week** to see your discussion leader if you have questions about your exam grade.

See Section 4f for the Exam Conflict and Makeup Policies.

4. GRADING

4a **COURSE GRADE:** Your course grade is based on 470 points accumulated as follows:

Quizzes (best 9 of 11, 6 points each)	54
WebAssign assignments	45
Written homework (best 4 of 5, 4 points each)	16
HITT Class participation points	33
Discussion Class participation points	2
Semester exams (80 points each)	240
Final exam	<u>80</u>
	470

The total sum of points is your numerical score, which will be converted to a letter grade according to the following scale.

A	420 - 470 pts	C	315 - 344 pts
A-	405 - 419 pts	C-*	300 - 314 pts
B+	390 - 404 pts	D+	285 - 299 pts
B	375 - 389 pts	D	270 - 284 pts
B-	360 - 374 pts	D-	255 - 269 pts
C+	345 - 359 pts	E	0 - 254 pts

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.**

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

For those taking the S-U option: S [315 - 470 points] U [0 - 314 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.

4b WRITTEN HOMEWORK: The written assignments posted on Sakai presents the minimum number of problems you should do in each section and will be collected by your discussion leader five times during the semester. The assignments will be graded on a scale of 0 – 4 points; each is checked for completeness and some problems will be graded for accuracy. The work must be your own and not taken from other sources. The top four scores will count, up to a total of 16 points.

An important part of each assignment is reading and understanding the concepts of the lecture and text material, and to preview the next lecture before class. Of course working problems is essential. Calculus material is cumulative, so you should complete each assignment as thoroughly as possible before your next class. While some problems may look similar, they demonstrate a unique detail of a calculus skill.

If you are having difficulty with any assignment, you may seek help from your lecturer or TA during scheduled office hours as well as the tutors at the Broward Teaching Center. Be sure to start problems early so you have time to get your questions answered!

Some homework problems may suggest the use of a graphing calculator. They are designed to help you visualize important concepts and to reinforce the mathematical processes involved. The use of a calculator is recommended but not required.

4c ONLINE HOMEWORK: The online homework administered on WebAssign is planned to complement the written exercises to maintain your knowledge of recent material. Online homework assignments will be posted 13 times during the semester and must be completed by the specified due date. Your score on each assignment will count up to a maximum 45 points, but the total number of points available is higher to offset credit lost due to technical difficulties or a missed assignment. **There are no make-ups or drops for online homework since you have several days to complete each assignment. Do not try to complete an assignment in one sitting; start early instead of waiting until the due date to avoid missing the deadline.**

4d QUIZZES: Your discussion leader will administer eleven quizzes, either in class or online, on the dates listed in the course calendar. Each will be graded on a scale of 0 to 6 points, and the top nine scores will count, to total up to 54 points. The quiz will be based on previous lectures and homework assignments.

4e CLASS PARTICIPATION POINTS: Up to 33 points may be earned by attendance in lecture and completing problems in class. Points will be collected through the use of the H-ITT course responder system (clicker) as announced in lecture. More details will be available in class and on the course home page. **YOU MAY NOT TURN IN WORK FOR A STUDENT WHO IS NOT IN CLASS (see section 2j).** There will be extra points available to account for an occasional absence or technical difficulties with your clicker. Total points will be capped at 33.

In addition, you have a chance to earn up to 2 points to participate in your discussion class during the semester. Your TA will provide more details in the first discussion class.

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.

NOTE: Homework, quizzes and class participation points account for 150 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.

4f MAKE-UP POLICY: All make-up work must be approved by the course coordinator, Dr. Huang, in LIT 372, during office hours. You must provide documentation of your absence.

- **Exam Conflicts – The 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. Huang 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.

You may also take the conflict exam if you are participating in a UF sponsored event during the regular exam time. You must provide documentation of the conflict to Dr. Huang in person at least ONE WEEK in advance of the exam date to sign up.

The conflict exam will be offered from 6:40 – 8:20 on the same night as the regular exam. You must sign up with Dr. Huang as indicated above. You will not be permitted to leave the exam room before 8:20PM.

- **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. Huang in her office 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 the course coordinator immediately (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 Dr. Huang in Little 372. **To be eligible for this make-up you must have received at least half of the lecture participation points that have been given so far.**

- **Make-up Quizzes:** There are no make-ups, unless,
 - 1) you are participating in a UF sponsored event, for which you must bring your documentation at least **one week prior** to Dr. Huang.
 - 2) you miss at least three discussion quizzes for which you have valid, documentable reasons for your absences. You will be allowed to make up the excused absences that are in excess of two. To be eligible for a make-up you must have received credit for at least half of the lecture participation points. Bring your documentation to Dr. Huang in Little 372 **within one week of your third discussion quiz absence.**
 - 3) you miss because of a religious holiday. You must notify Dr. Huang **within the first three weeks of class** if you will be missing discussion class due to a religious holiday.
 - 4) you miss because of a court-ordered obligation – see Dr. Huang.

Your discussion leader cannot give makeups without the authorization of the course coordinator.
- **Make-up Homework collection:** There are no make-ups, unless,
 - 1) you are participating in a UF sponsored event. In this case you must bring your HW to your TA **prior to the discussion class** along with your documentation.
 - 2) you are present in discussion class at the time of the collection but forget to bring your homework assignments. In this case, you have till noon next day to bring the ENTIRE homework assignments to your TA with 1 point penalty. You must notify and make arrangement with your TA before you leave the discussion that day.
- **Make-up WebAssign HW:** There are no make-ups.
- **Make-up Clicker points:** There are no make-ups.
- **Other Make-ups:** There are no make-ups on any extra points opportunities.

4g 10-MINUTE POLICY: Only the students who are present within the first 10 minutes of the class and stay for the entire period will be allowed to participate in the class activities (including submitting clicker questions, taking quizzes, and turning in homework assignments).

4h INCOMPLETE: A student who has completed a major portion of the course with a passing grade but is unable to complete the final exam or other course requirements due to illness or emergency may be granted an incomplete, indicated by a grade of “I”. This allows the student to complete the course within the first six weeks of the following semester. The student must contact Dr. Huang before finals week to sign an incomplete grade contract (<http://clas.ufl.edu/forms/incomplete-grade-contract.pdf>), and must provide documentation of the extenuating circumstances preventing him or her from taking the final exam. The grade of “I” is never used to avoid an undesirable grade, and does not allow a student to redo work already graded or to retake the course. See the official policy at <http://www.math.ufl.edu/department/incomplete-grades/>.

5. 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. Students demonstrate competence in the terminology, concepts, theories 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 discussions, homework assignments and quizzes, three semester exams and final exam.

6. ONLINE COURSE EVALUATION

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu>. Evaluations are available from April 13-24.

PREREQUISITES FOR MAC 2311

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)

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

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

Parallelogram: area = bh

Rectangular box: volume = lwh

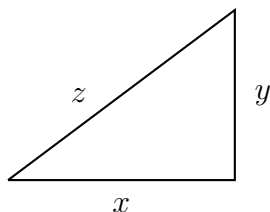
Sphere: volume = $\frac{4}{3}\pi r^3$; surface area = $4\pi r^2$

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

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

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

2. Sum and Difference Formulas:

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

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

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

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:

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

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