

MAC 2311 – 18H – 4 credits
Honors Calculus-Analytic Geometry 1



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COURSE MEETINGS: M/W/F 11:00AM-12:50PM IN AD 119, ON THE JUPITER CAMPUS

TEXT: *Calculus of a Single Variable*, 11th ed, Larson et al., 2018, accessible through Cengage Unlimited cengage.com/unlimited. You only need to buy a 4-month subscription (\$119.99), but will actually have a multi-term access using the same textbook edition (thus you will have your Calculus 2 covered ☺). For assistance consult <https://www.cengage.com/faq/#instructors/>

CALCULATOR. You must have a **TI-30Xa** (or **TI-30Xa Solar**) basic scientific calculator for quizzes and exams, and this is the only calculator that is allowed. You can buy this calculator at most major retailers (Amazon, Walmart, Target, Staples, etc.), where it is approximately \$10.00, or at the Boca Raton campus FAU Bookstore. You may, of course, use any calculator or online tool (such as Wolfram Alpha) to complete homework exercises.

GENERAL DESCRIPTION: Inspired by problems in astronomy, Isaac Newton and Wilhelm Gottfried Leibnitz developed the ideas of calculus roughly 300 years ago. Since then, calculus has provided the foundation for advances in many other fields, even those which seem far removed from mathematics. You will find applications in chemistry, physics, economics, biology, medicine, business, psychology, and of course mathematics. Calculus is so important that it is often considered the gateway to many of the disciplines in which it is used. The power of calculus lies in its power to reduce complicated problems to simple rules and procedures. While these procedures can be (and often are) taught with little regard to the underlying mathematical concepts or their practical uses, our emphasis will be on understanding all of these: concepts, procedures and uses. We will engage in the full mathematics process, which includes searching for patterns, order and reason; creating models of real-world situations to clarify and predict better what happens around us; understanding and explaining ideas clearly; and applying the mathematics we know to solve unfamiliar problems. Participation in this variety of mathematical activities is challenging, and for many students, the experience will be vastly different from experiences in more traditional mathematics course. So what *is* calculus? Very briefly, calculus is the study of changing quantities. It has two main themes: differentiation, which studies rates of change and is the focus of this course; and integration, which we will mostly save until next semester.

GOALS. Some specific goals of the course are for you to:

- think critically (always a goal in mathematics classes);
- identify, transform and use elementary functions, especially in their common applications;
- understand, compute and estimate derivatives algebraically, graphically, numerically, and verbally;
- understand and estimate definite integrals algebraically, graphically, numerically and verbally; and become familiar with simple differential equations;
- apply knowledge of mathematics to identify, formulate, and solve problems, particularly problems related to the environment;
- work effectively in heterogeneous teams;
- communicate effectively, especially by writing precisely about technical things;
- use technological tools such as graphing calculators and equation editors in an appropriate manner;
- improve logical thinking and problem-solving skills.

CONDITIONS. As you read through this syllabus please be aware that we are hoping that there is no outbreak of COVID during the semester and that the course will function as a typical course. But given the real chance that at some point, the FAU administration in conjunction with the Faculty Senate (and all other responsible parties), deems it necessary to convert this course into a fully remote experience, the second section of this syllabus covers what will be done in this event. As of right now there all classes after Thanksgiving break will be done remotely, including the final exam. You should certainly plan accordingly with regards to setting up internet access to attend class via webex meetings.

Some of you have chosen to take the course remotely. The room is fitted with Lecture Capture. I have been told it will take some time to upload the lecture, usually a few hours after the class has ended. For more information on Lecture Capture check here:

<https://business.fau.edu/undergradonline/lcvs-classes/index.php>

I will also try to set up a webex or zoom meeting to run synchronously. **But** this is not guaranteed. Definitely for the first two weeks of class you should plan on being part of the class asynchronously.

Any student taking an exam remotely should have access to a printer and scanner. Students will need to print out the exams, then complete them, scan them, and then submit them via upload on Canvas. Remote exams will be proctored. Also, students should check here for the student guide on Lockdown Browser: https://www.fau.edu/canvas/Files/lockdownBrowser_setup.pdf

COLLABORATION AND THE HONOR CODE. I expect you to abide by the Honors College Academic Honor Code. It is available at <http://www.fau.edu/honors/academics/honor-code.php>. I assume that you're here to learn. If you talk to each other, you will learn from each other, perhaps more than you will learn from me. I encourage you to form study groups. Try the homework yourself, and then get together with a study group to go over questions, and to study for quizzes and tests. You will learn a great deal from articulating your questions and explaining material to your peers. Collaboration on homework and in class worksheets is encouraged, but you must be sure you understand and can complete problems on your own, as collaboration on tests, quizzes and the final exam is forbidden.

Video, Audio or Other Recordings of class is forbidden without express permission of the instructor.

Classroom Etiquette Policy

In order to enhance and maintain a productive atmosphere for education, personal communication devices, such as cellular telephones and pagers, are to be disabled in class sessions.

Policy on Accommodations

In compliance with the Americans with Disabilities Act Amendments Act (ADAAA), students who require reasonable accommodations due to a disability to properly execute coursework must register with Student Accessibility Services (SAS) and follow all SAS procedures. SAS has offices across three of FAU's campuses -- Boca Raton, SU 131 (561-297-3880); in Davie, LA 131 (954-236-1222); in Jupiter and all Northern Campuses, SR 111F (561-799-8585). Disability services are available for students on all campuses. For more information, please visit SAS website at www.fau.edu/sas/.

Counseling and Psychological Services (CAPS) Center

Life as a university student can be challenging physically, mentally and emotionally. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services – individual counseling, support meetings, and psychiatric services, to name a few – offered to help improve and maintain emotional well-being. For more information, go to <http://www.fau.edu/counseling/>

Academic Integrity Policy

Students at Florida Atlantic University are expected to maintain the highest ethical standards. Academic dishonesty is considered a serious breach of these ethical standards, because it interferes with the university mission to provide a high quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive of the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).

The WHC Academic Honors Code is found here: <http://www.fau.edu/honors/academics/honor-code.php>.

Plagiarism

Plagiarism is the deliberate use and appropriation of another's work without identifying the source and trying to pass off such work as one's own. Any student who fails to give full credit for ideas or materials taken from another has plagiarized. This includes all discussion board posts, journal entries, wikis, and other written and oral presentation assignments. Plagiarism is unacceptable in the University community. Academic work must be an original work of your own thought, research, or self-expression. When students borrow ideas, wording, or organization from another source, they must acknowledge that fact in an appropriate manner. If in doubt, cite your source.

COVID-19 Statement

All students in face-to-face classes are required to wear masks during class, and students must sanitize their own workstations upon entering the classroom. Taking these measures supports the safety and protection of the FAU community. Students who do not adhere to these rules will be asked to leave the classroom and/or be removed from the course. Students experiencing flu-like symptoms (fever, cough, shortness of breath), or students who have come in contact with an infected person should immediately contact FAU Student Health Services (561-297-3512).

ON-CAMPUS EXPERIENCE: CONDITION I

ATTENDANCE. You are responsible for all material covered in class. Attendance is not mandatory but I will take attendance since there is a strong correlation between attendance and final grades. Attendance is **strongly** encouraged. Missing class more than once or twice during the semester is likely to affect your grade, either directly or indirectly. Due to the current pandemic I do encourage you to let me know if you are feeling sick, and in this case please do not come to class. You will not be penalized if you miss class. You will be able to watch a video recording of the class via an upload from Lecture Capture to Canvas.

HOMEWORK. Please read the section to be covered *before* the lesson, then complete the homework exercises assigned on a given day before the next class meeting. There are two aspects to homework: [LE] and **WebAssign**.

First, at the end of each section in the Larson/Edwards text [LE], there are numerous HW problems. On my webpage, I have created a detailed list of problems that I think are instructive and that you should be able to do. The odd numbered exercises have the answers included in the e-book. I will not collect these HW problems. You should do as many as you can to ensure that you understand the material. Please take note that there is a service that comes with the textbook called CalcView. Here you can find worked out video solutions to selected exercises from the book.

Second, **WebAssign** will be used to submit homework. Homework should be submitted by the posted deadline to get credit. Your solutions to the homework problems provide excellent study guides for exams.

Note, you should know that if you only do the HW problems from **WebAssign** then you might not be prepared for the quizzes, tests, and final exam. **The key to success in this course is doing the textbook homework and WebAssign problems. During class you should also plan on asking questions when you have them!** We will discuss some homework problems in class, but there will often not be enough time to discuss all of them. Please come to office hours or visit the math tutors if you have additional questions about the homework.

QUIZZES AND MAKEUP POLICY. Most weeks, we will have a quiz to help ensure that you stay on top of the material. Your three (3) lowest quiz scores will be dropped for the purposes of determining your quiz grade. The point of the quiz is to give you practice in answering questions only using your brain and a calculator. Consideration practice and preparation for the exams. You will have 24 hours to complete the quiz. **Since 3 quiz grades are dropped, makeup quizzes are not permitted without prior consultation or in case of a documented illness or emergency.**

TESTS AND MAKEUP POLICY. We will have three (3) tests and a comprehensive final exam. **Make-up exams are rarely given. I will give make-up exams only if you are ill, if there is a documented emergency, or if you make arrangements with me at least one class period before; if you are ill, I expect a letter from a physician verifying this. Otherwise, if you miss a test or exam you will receive a 0 for each test/exam missed.** Each test/exam will be proctored. This is obvious for students who take the exam during the regularly scheduled time. But exams and tests will also be proctored for students not taking the exam in AD 119.

GATEWAY TEST. The Gateway test is not included in your final average. However, **failing to pass the gateway test will result in the lowering of your final grade by one full letter grade.** The Gateway test is on differentiation, and you may take it as many times as needed until you pass. It must be completed by the date of the final exam. The gateway exam will be done remotely and proctored.

POLICY ON INCOMPLETES. Incomplete grades will be assigned only in the case of a documented emergency or illness. No exceptions.

WORKLOAD AND ASSISTANCE. You should expect to spend **10 to 12 hours each week**, outside of class, on the course material. This includes reading, homework, and studying for quizzes and exams. Some weeks (those in which an exam is scheduled, for instance) may require slightly more of your time, other weeks may require slightly less, but *on average*, budget 10 to 12 hours each week. Please ask questions and seek assistance as needed. Free, walk-in tutoring will be available, probably starting in the second week of classes. I encourage you to make use of my office hours.

GRADING.

| | |
|-----|--------------------------------|
| 3% | Quizzes (lowest three dropped) |
| 5% | Portfolio |
| 20% | Homework -- Webassign |
| 7% | Homework -- Short |
| 60% | Three tests (20% each) |
| 5% | Comprehensive Final Exam |

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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| A | A- | B+ | B | B- | C+ | C | C- | D+ | D | D- | F |
| 93-100 | 90-92 | 87-89 | 83-86 | 80-82 | 77-79 | 73-76 | 70-72 | 67-69 | 63-66 | 60-62 | 0 - 59 |

REMOTE EXPERIENCE: CONDITION 2

In the event that the administration decides to change classes to a remote experience, and this occurs prior to Test 3, then we will follow this portion of the syllabus. From that date on, evaluation of a student's performance will be effort based. If the date that we move to a remote experience occurs prior to Test 1, then 85% of the final grade will be based on HW. If the date happens after Test 1 but prior to Test 2, then it will be 65% of the final grade. And if the date happens after Test 2 but prior to Test 3, then HW will be worth 45% of the final grade.

HOMEWORK. Please read the section to be covered *before* the lesson, then complete the homework exercises assigned on a given day before the next class meeting. There are two aspects to homework: [LE] and **WebAssign**.

First, at the end of each section in the Larson/Edwards text [LE], there are numerous HW problems. On my webpage, I have created a detailed list of problems that I think are instructive and that you should be able to do. The odd numbered exercises have the answers included in the e-book. You should do as many as you can to ensure that you understand the material. Please take note that there is a service that comes with the textbook called CalcView. Here you can find worked out video solutions to selected exercises from the book. Some of the [LE] problems will be collected and graded. Students will be expected to upload their HW via canvas.

Second, **WebAssign** will be used to submit homework. Homework should be submitted by the posted deadline to get credit. Your solutions to the homework problems provide excellent study guides for exams.

Note, you should know that if you only do the HW problems from **WebAssign** then you might not be prepared for the quizzes, tests, and final exam. **The key to success in this course is doing the textbook homework and WebAssign problems. During class you should also plan on asking questions when you have them!** We will discuss some homework problems in class, but there will often not be enough time to discuss all of them. Please come to office hours or visit the math tutors if you have additional questions about the homework.

QUIZZES AND MAKEUP POLICY. Most weeks, we will have a quiz to help ensure that you stay on top of the material. Your three (3) lowest quiz scores will be dropped for the purposes of determining your quiz grade. **Since 3 quiz grades are dropped, makeup quizzes are not permitted without prior consultation or in case of a documented illness or emergency.**

TESTS AND MAKEUP POLICY. We will have possibly (0), (1), or (2) tests and a comprehensive final exam. **Make-up exams are rarely given. I will give make-up exams only if you are ill, if there is a documented emergency, or if you make arrangements with me at least one class period before; if you are ill, I expect a letter from a physician verifying this. Otherwise, if you miss a test or exam you will receive a 0 for each test/exam missed.** Each test/exam will be proctored. This is obvious for students who take the exam during the regularly scheduled time. But exams and tests will also be proctored for students not taking the exam in AD 119.

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WORKLOAD AND ASSISTANCE. You should expect to spend **10 to 12 hours each week**, outside of class, on the course material. This includes reading, homework, and studying for quizzes and exams. Some weeks (those in which an exam is scheduled, for instance) may require slightly more of your time, other weeks may require slightly less, but *on average*, budget 10 to 12 hours each week. Please ask questions and seek assistance as needed. Free, walk-in tutoring will be available, probably starting in the second week of classes. I encourage you to make use of my office hours. There will also be remote tutoring available.

GRADING.

| | |
|-----------------|--------------------------------|
| 3% | Quizzes (lowest three dropped) |
| 5% | Portfolio |
| 80%, 60%, 40% | Homework -- Webassign |
| 7% | Homework -- Short |
| 0%, 20%, or 40% | Three tests (20% each) |
| 5% | Comprehensive Final Exam |

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|--------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--------|
| A | A- | B+ | B | B- | C+ | C | C- | D+ | D | D- | F |
| 93-100 | 90-92 | 87-89 | 83-86 | 80-82 | 77-79 | 73-76 | 70-72 | 67-69 | 63-66 | 60-62 | 0 - 59 |

Honors Calculus and Analytic Geometry 1

MAC 2311, 4 credits, Fall 2020

Subject to Change through the semester

Text: *Calculus of a Single Variable*, 11th Edition, Larson et al.

| Date | Topic | Sections | Assignment |
|----------|---|------------|----------------|
| M Aug 24 | Graphs and Models Linear Models and Rates of Change | P.1 P.2 | |
| W Aug 25 | Functions and domain | P.3 | |
| F Aug 27 | | | |
| M Aug 31 | Calculus Preview Limits – Graphically and Numerically | 1.1 1.2 | Quiz 1 |
| W Sep 2 | | | |
| F Sep 4 | Limits - Analytically | 1.3 | Quiz 2 |
| M Sep 7 | LABOR DAY – no class | | |
| W Sep 9 | Continuity | 1.4 | |
| F Sep 11 | | | Quiz 3 |
| M Sep 14 | Intermediate Value theorem Infinite Limits | 1.5 | Quiz 4 |
| W Sep 16 | | | |
| F Sep 18 | Derivative and Tangent Lines Basic Differentiation Rules | 2.1 2.2 | Quiz 5 |
| M Sep 21 | Product and Quotient Rule Higher Order Derivatives | 2.3 | Quiz 6 |
| W Sep 23 | The Chain Rule REVIEW for TEST 1 | 2.4 | Quiz 7 |
| F Sep 25 | TEST 1 | | |
| M Sep 28 | Implicit Differentiation | 2.5 | |
| W Sep 30 | | | |
| F Oct 2 | Related Rates | 2.6 | Quiz 8 |
| M Oct 5 | Extrema Rolle's and Mean Value Theorems | 3.1 3.2 | Quiz 9 |
| W Oct 7 | | | |
| F Oct 9 | Increasing, Decreasing functions First Derivative Test | 3.3 | Quiz 10 |
| M Oct 12 | Concavity and 2nd Derivative Test | 3.4 | |
| W Oct 14 | Limits at Infinity | 3.5 | |

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|-----|---------|--|------------|---------------------|
| F | Oct 16 | Curve Sketching | 3.6 | Quiz 11 |
| M | Oct 19 | Optimization | 3.7 | Quiz 12 |
| W | Oct 21 | REVIEW for TEST 2 | | |
| F | Oct 23 | TEST 2 | | |
| M | Oct 26 | Anti-derivatives and Indefinite Integration, | 4.1 | |
| W | Oct 28 | Area | 4.2 | |
| F | Oct 30 | Riemann Sums and Definite Integrals Fundamental Theorem of Calculus | 4.3 4.4 | Quiz 13 |
| M | Nov 2 | Integration by Substitution | 4.5 | Quiz 14 |
| W | Nov 4 | | | |
| F | Nov 6 | Logarithms | 5.1 5.2 | |
| M | Nov 9 | More on logarithms Inverse Functions | 5.2 5.3 | |
| W | Nov 11 | VETERAN'S DAY – no class | | |
| F | Nov 13 | Exponential Functions | 5.4 | Quiz 15 |
| M | Nov 16 | Applications | 5.5 | |
| W | Nov 18 | REVIEW for TEST 3 | | Quiz 16 |
| F | Nov 20 | TEST 3 | | |
| M | Nov 23 | L'Hopital's Rule Inverse Trig Functions | 5.6 5.7 | |
| W | Nov 25 | Differentiation and Integration | 5.8 | Quiz 17 |
| F | Nov 27 | THANKSGIVING BREAK | | |
| M | Nov 30 | REVIEW for FINAL GATEWAY EXAM | | Quiz 18 |
| W | Dec 2 | Additional GATEWAY EXAM day | | |
| F | Dec 4 | Additional GATEWAY EXAM day | | |
| | Dec 7-9 | REVIEW for FINAL | | |
| Sat | Dec 12 | FINAL EXAM, 10:30 am– 1:00pm | | Covers all material |