

# SYLLABUS

## MATH 160 Calculus I

Spring 2018

| INSTRUCTOR INFORMATION |  |
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| Instructor:      | Dr. Andrew Incognito                                                                                                                                                |
| Office:          | Sci 207C                                                                                                                                                            |
| Telephone:       | (843) 349-2513                                                                                                                                                      |
| E-mail:          | <a href="mailto:aincogni@coastal.edu">aincogni@coastal.edu</a>                                                                                                      |
| Office Hours:    | MTW 1:30 PM -3:30 PM, <i>and by appointment</i>                                                                                                                     |
| Course webpages: | <a href="http://ww2.coastal.edu/aincogni">ww2.coastal.edu/aincogni</a> and <a href="http://ww2.coastal.edu/dpbanjade/math160">ww2.coastal.edu/dpbanjade/math160</a> |

| COURSE DESCRIPTION |
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| Prerequisite:      | MATH 130 OR 130I and a C or better in MATH 131, or a C or better in MATH 135, or placement test.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Textbook:          | <i>Calculus I</i> by Andrew Incognito: <a href="https://ximera.osu.edu/incognito-calc1">https://ximera.osu.edu/incognito-calc1</a> , and <i>Calculus Volume 1</i> by OpenStax <a href="https://openstax.org/details/books/calculus-volume-1">https://openstax.org/details/books/calculus-volume-1</a> (You can also purchase a copy from the bookstore)                                                                                                                                                                                                                                                                                                                 |
| Course Topics:     | Limits, continuity, differentiation and integration of algebraic and transcendental functions, applications of the derivative to curve sketching, optimization and related rates.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Course Objectives: | We will develop the basic tools of calculus - limits, derivatives and integrals - and learn how to apply them to a variety of problems. We will see how calculus can help us understand the behavior of functions and their graphs, the relationship between average and instantaneous rates of change, and the interplay between distance, velocity and acceleration. We will solve problems of optimization, related rates, and linear approximation. As the course progresses, you will develop a conceptual understanding of calculus and general critical thinking skills which will allow you to understand and solve many new types of problems with confidence. |

**Tutoring Help:** You can get free tutoring in the Mathematics Learning Center. Visit their webpage (<https://www.coastal.edu/mathcenter/>) for hours and location. There will also be several math professors holding outreach hours at various locations around campus to provide assistance. The weekly outreach schedule is on the course webpages.

**Exams:** There will be four 50-minute exams and a cumulative final exam. The **tentative** dates are as follows.

| Date                  | Exam  | Sections                          |
|-----------------------|-------|-----------------------------------|
| February 02           | I     | 2.1, 2.2, 2.3, 4.6, 2.4, 3.1, 3.2 |
| February 28           | II    | 3.3 – 3.9, 4.1                    |
| March 28              | III   | 4.2–4.5, 4.7, 4.8                 |
| April 23              | IV    | 4.10, 5.1– 5.7                    |
| May 01 (8:30-10:30AM) | Final | comprehensive                     |

Note: Exam dates are subject to change. Make-up exams will be made solely at my discretion. If you know ahead of time that you must miss an exam, you must let me know at least two class periods in advance.

**Homework:** The best way to learn calculus is by solving problems. A selection of homework problems will be assigned and collected once a week for grading. You are encouraged to discuss homework problems with classmates. However, you are expected to write up your solutions on your own since you are responsible for understanding and assimilating the material. Your lowest homework grade will be dropped. Late homework will not be accepted.

**Quizzes:** We will have a short quiz roughly once per week. The quizzes will be based on the class notes and the homework problems. Your lowest quiz grade will be dropped. There will be no make-up quizzes.

**Calculator:** While a graphing calculator is not required for this course, you may find one to be useful. Calculators of level TI 89 or higher (or calculator that can do symbolic manipulation) will NOT be permitted for use during exams or quizzes. If you have questions about your calculator please let me know. Cell phones and tablets are not an acceptable substitute for a calculator and will NOT be allowed.

**Grade Guidelines:** Quiz = 7.5%, Homework = 7.5%, 4 Tests= 60%, Final= 25%

Note: if you make less than a 50 on the final, then the highest grade you can make in MATH 160 is a D+.

**Grade Scale:**

|           |           |          |             |
|-----------|-----------|----------|-------------|
| A: 90–100 | B+: 87–89 | B: 80–86 | C+: 77–79   |
| C: 70–76  | D+: 67–69 | D: 60–66 | F: below 60 |

**Important Dates:**

|                     |                                              |
|---------------------|----------------------------------------------|
| Monday, January 15  | Martin Luther King, Jr. holiday - No classes |
| March 05 -10        | Spring Break                                 |
| Friday, March 30    | Student Holiday                              |
| Wednesday, March 21 | Last day to drop with grade of “W”           |
| Wednesday, April 25 | Last day of classes                          |

**Students with Disabilities:** Any student with a documented disability needing academic adjustments or accommodations is requested to speak with me during the first week of class. All discussions will remain confidential.

**Attendance Policy:** Students are obligated to attend class regularly. Absences, excused or not, do not absolve students from the responsibility of completing all assigned work on time. Read the following page for details:<http://www.coastal.edu/policies/pdf/acad-125classattendance.pdf>.

**Cell phone, Ipad/Tablet, Computer Policy:** Except in case of emergencies, the use of cell phones, ipads/tablets or other mobile communication devices is prohibited during class. Students are permitted to use computers during class for note-taking and other class-related work only.

**Statement of Academic Integrity:** Coastal Carolina University is an academic community that expects the highest standards of honesty, integrity and personal responsibility. Members of this community are accountable for their actions and reporting the inappropriate action of others and are committed to creating an atmosphere of mutual respect and trust. Please review the revised Code of Conduct that is available on the web at: <https://www.coastal.edu/conduct/>

### Math 160 - Student Learning Outcomes

Student learning outcomes for Math 160 (Calculus I) fall into one of the following two categories: computational and conceptual. The following list summarizes the fundamental computational skills and concepts of calculus a student will possess when he/she successfully completes Math 160.

1. Compute average rates of change and instantaneous rates of change of a certain quantity as well as the ability to explain the relationship between these two types of rates of change.
2. Solve the classic problem of finding the equation of the line tangent to the graph of a differentiable function  $f$  at a given point  $(a, f(a))$ .
3. Explain the relationship between the slope of a tangent line and the instantaneous rate of change. Explain the relationship between the slope of a secant and the average rate of change.
4. Compute a variety of limits using numerical and graphical techniques, limit laws and algebraic techniques.
5. Identify continuous functions as well as explain why a function is or is not continuous. Apply the Intermediate-Value Theorem to an equation to show that a solution does or does not exist.
6. Compute several basic derivatives using the definition of the derivative such as polynomial functions, trigonometric functions, exponential functions, logarithmic functions, and inverse trigonometric functions. The ability to use the product rule, quotient rule, chain rule, implicit differentiation, and logarithmic differentiation to compute the derivatives of more complicated functions.
7. Solve the following types of applied problems: related rates problems, optimization problems and rates of change problems.
8. Explain The Mean Value Theorem in terms of average rates of change and instantaneous rates of change as well as provide a geometric interpretation of The Mean-Value Theorem in terms of secant lines and tangent lines.
9. Explain the relationship between a function  $f$ , its first derivative  $f'$ , and its second derivative  $f''$ . The ability to use the first and second derivatives of a function  $f$  to gather certain information about the behavior of the function  $f$ .
10. Solve the classic problem of computing the area bounded between the  $x$ -axis and the graph of a continuous function  $f$  on a given interval  $[a, b]$ .
11. Explain the intricate relationship between integration and differentiation via The Fundamental Theorem of Calculus.
12. Compute basic definite integrals and indefinite integrals.

The syllabus is for planning purposes only and is subject to change.