MATH 2313.002 & 2113.002, Calculus I
Department of Mathematics and Statistics
Course Policy Sheet and Syllabus—Spring 2024

Professor: Dr. Brittney Falahola
Office: 324 Mathematics Building
Email: falaholabl@sfasu.edu
Office Phone: 936.468.1772
Office Hours: Office hours will be held face-to-face or via Zoom (whichever fits your preference!). See our course page on D2L for a link to join Zoom office hours. For the times in the table below, no appointment is needed; simply attend by dropping by my office or clicking on the Zoom link. In addition, individual appointments at other times may also be scheduled by emailing me in advance.

<table>
<thead>
<tr>
<th>Monday</th>
<th>Tuesday</th>
<th>Wednesday</th>
<th>Thursday</th>
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<tr>
<td>1:15-2:45pm</td>
<td>12:30-1:30pm</td>
<td>1:15-2:45pm</td>
<td>12:30-1:30pm</td>
<td>By appt.</td>
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</tbody>
</table>

A note on virtual office hours: We will treat virtual office hours as much like face-to-face office hours as possible! Just as you would wait in the hall should you find another student already visiting with me in my office, you will be placed in a “waiting room” on Zoom upon arriving for office hours. If there is no one else in the meeting, I will immediately let you in. Otherwise, you may have to wait a few minutes as I conclude a discussion with another student. I will get to you even if my office hour has ended – so please hang out until we talk. In addition, during office hours, I may ask if you would be open to allowing another student to join our discussion. You are welcome to respond as best suits your needs; we can continue to meet one-on-one or we can let others join us – your choice!

Course description: Topics include limits, continuity, differentiation of algebraic, trigonometric, and other transcendental functions, and applications of differentiation, including optimization and curve sketching, antiderivatives, integration by substitution, definite integrals, the Fundamental Theorem of Calculus, and application of integration to areas of regions in the plane.

Core Objectives (CO):
1. Critical Thinking [CO 1]: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. Communication Skills [CO 2]: to include effective development, interpretation and expression of ideas through written, oral and visual communication
3. Empirical and Quantitative Skills [CO 3]: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Text and Materials: The required textbook is Calculus (Early Transcendentals), 4th edition, by Rogawski, Adams, and Franzosa, ISBN-13 978-1319050740, ISBN-10 1319050743. Topics for MATH 2313 are included in chapters 2, 3, 4, and 5 of the text. For exams, students may use only a non-programmable, non-graphing calculator.

Exam Calendar: Please note that the dates for our midterm exams (Exams 1 through 4) below are subject to change. The final is university-scheduled and cannot be taken at a different time without permission of the Dean of the College of Sciences and Mathematics. Be sure to arrange your end-of-the-semester travel plans accordingly.

Exam 1    Thursday, February 8
Exam 2    Wednesday, March 6 & Thursday, March 7
Exam 3    Wednesday, April 10 & Thursday, April 11
Exam 4    Wednesday, May 1, Thursday, May 2 & Friday, May 3
Final Exam    Wednesday, May 8, 10:30am – 12:30pm, Math Building Room 205
Course Requirements:

- **Four midterm exams**—[CO 1, 2, 3] If a student must miss an exam due to an excused absence, special arrangements should be made at least one week in advance (when possible). Students are responsible for bringing their own scientific calculator to exams; no graphing calculators may be used.

- **Quizzes**—[CO 1, 2, 3] We will have weekly quizzes on Fridays, except on exam weeks. You will be told each Monday prior to a quiz (at the latest!) which learning targets will be assessed on that quiz. Because there will be opportunities for reassessment of learning targets, there will be no (traditional) make-up quizzes.

- **Lab assignments**—[CO 1, 2, 3] Labs will be turned in and graded as either Satisfactory (S), Unsatisfactory (U), or Incomplete with No Revision (INR). During the lab meetings, students will investigate various topics in calculus using Desmos or Excel. Possibly more helpful than the actual mathematics in the lab assignments, you will practice organizing your thoughts, develop a working understanding of mathematical and programming operations, and troubleshoot programming errors.

- **A comprehensive final exam**—[CO 1, 2, 3] The final exam is **Wednesday, May 8, 10:30am – 12:30pm**. The final exam will cover all of the core and supplemental learning targets.

- **Online Homework**—[CO 1, 2, 3] For roughly each learning target in the course, there will be a corresponding online homework set with due dates clearly labeled on each assignment. These assignments allow for practice with computational techniques with immediate feedback (the system will grade your answers upon submission). You are welcome to use your textbook and class notes to complete each homework set. Collaboration with your classmates is also welcome, but ensure that you are continually striving to master the concepts. Academic integrity should be maintained, as with other assessments in this course. Online homework exercises are located on the WeBWorK math homework system at webwork.sfasu.edu. Your WeBWorK login username is the same as your D2L username. If you run into a technical issue or error with WeBWorK (during submissions, for instance), email me a screenshot of the error you receive. In general, late submissions to WeBWorK will not be accepted, and deadlines are set in stone.

Exercises assigned from the text (the list is found in this syllabus) will not be collected for a grade. However, it is crucial to your understanding of the course material that you complete the assigned problems (at a minimum!) as preparation for quizzes, exams, and daily participation.

- **Class attendance and participation**—Students are expected to attend all class meetings, arriving on time and actively participating in class discussions. Cell phones and other devices that have the potential to distract you, me, or your classmates should be put away and silenced. If you are absent, you are responsible for determining what you missed and for being prepared for class when you return.

- **Preparing for class**—Students should be prepared to invest several hours per day outside of class reading the text, practicing examples, and working homework exercises. Material to be discussed in class should be read before coming to class; check D2L for items to complete in preparation. Check your university email regularly, as I may send reminders, assignments, or announcements.

- **Asynchronous Instruction**—This course may include instructional time that is delivered asynchronously. Examples of asynchronous instruction may include (but are not limited to): written content, video content, discussions, synthesis exercises, reflection activities, peer review, and skills practice.
Standards-Based Grading

On semester assignments (midterm exams, weekly quizzes, and labs), grades will be assigned differently than how you may have typically encountered in other courses. Instead of using a percentage or points-based system, your grade will be determined by how well you display a mastery of specific sorts of mathematical tasks called learning targets. Since there are no points, there is no partial credit on most items. Indeed, you will find that the grading system in this course insists that you show consistent excellence in all assignments in the course – outstanding work on quizzes, for example, does not “bring up” poor work on labs. This can be challenging, but there is also a revision and reassessment system in place for most assignments that allows you to try a concept more than once to demonstrate understanding.

Fair warning: This may be a little more complicated than you are used to. That’s okay! If at any point in the semester you need clarification on how the system works or your standing in the course, you are encouraged to talk with me. The goal with this system is to give you more control over your grade with less stress and to reflect your effort and improvement (not the result of a single bad test day).

There are 26 learning targets that will be assessed during the semester, divided into two categories: Core and Supplemental. These are listed later in this syllabus. Each of these learning targets focuses on a skill or concept of calculus. The Core Learning Targets are the most essential skills, in which every student must show some competency to pass the course. The Supplemental Learning Targets focus on other important calculus skills.

The following sections describe the structure of this grading system and how it will work in our class. Pay close attention in each section to definitions of terms (such as “Earn Proficiency” vs. “Master,” or “Satisfactory”).

How your Final Course Grade is Determined

See the table below for the requirements necessary to earn each letter grade. Both MATH 2313 and MATH 2113 will be awarded the same letter grade based on your fulfillment of the items in the table below. Please note the following definitions:

- To earn PROFICIENCY a learning target, one must earn a Satisfactory (S) grade on that target during a quiz, exam, or reassessment.
- To MASTER a learning target, a second grade of Satisfactory (S) must be earned on that same target during a quiz, exam, or reassessment.

<table>
<thead>
<tr>
<th>To earn:</th>
<th>Do ALL of the following:</th>
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</table>
| A | • Earn Proficiency in all 12 Core Learning Targets, and Master at least 10 of them.  
• Earn Proficiency in all 14 Supplemental Learning Targets, and Master at least 12 of them.  
• Earn Satisfactory on at least 4 Labs.  
• Have a final online homework grade of at least 85%. |
| B | • Earn Proficiency in all 12 Core Learning Targets, and Master at least 7 of them.  
• Earn Proficiency in 12 Supplemental Learning Targets, and Master at least 6 of them.  
• Earn Satisfactory on at least 3 Labs.  
• Have a final online homework grade of at least 75%. |
| C | • Earn Proficiency in all 12 Core Learning Targets, and Master at least 4 of them.  
• Earn Proficiency in 10 Supplemental Learning Targets.  
• Earn Satisfactory on at least 2 Labs.  
• Have a final online homework grade of at least 65%. |
| D | • Earn Proficiency in 8 Core Learning Targets.  
• Earn Proficiency in 7 Supplemental Learning Targets.  
• Earn Satisfactory on at least 1 Lab.  
• Have a final online homework grade of at least 50%. |
| F | Given if not all the requirements for a D are met. |

Note: The initial schedule has 5 Labs, with the option of a sixth lab, if needed. If this changes, the table will be updated.

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1 Some wording in this section comes from Dr. Robert Talbert of Grand Valley State University and Dr. Kate Owens of the College of Charleston, two professors who are champions of alternative grading in university mathematics.
Grading Standards

**Labs**: Labs will be graded either Satisfactory (S), Unsatisfactory (U), or Incomplete with No Revision (INR) based on the following criteria.

<table>
<thead>
<tr>
<th>Mark</th>
<th>Description</th>
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<tbody>
<tr>
<td>S</td>
<td>The submission gives complete, clearly-written, and well-reasoned responses to all lab prompts. There may be some minor errors, but an understanding of the calculus concepts is clear. The write-up is neatly done and easy to navigate. The work uses computer technology (Desmos, Excel, etc.) in an effective and appropriate way.</td>
</tr>
<tr>
<td>U</td>
<td>The submission is complete (all parts have been attempted with good faith effort) but has significant issues which demonstrate a misunderstanding of a calculus concept. A revision is required for credit.</td>
</tr>
<tr>
<td>INR</td>
<td>One or more of the problems in the submission have been omitted or consist of trivial or irrelevant work (i.e., the lab is submitted with intentional inclusions in order to “Revise” them later). No revision will be possible later.</td>
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</tbody>
</table>

**Learning Targets**: Learning targets will also be graded either Satisfactory (S), Progressing (P), or Incomplete (I) based on the following general criteria.

<table>
<thead>
<tr>
<th>Mark</th>
<th>Description</th>
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<tbody>
<tr>
<td>S</td>
<td>The submission gives complete, clearly-written, and well-reasoned responses. The solution is organized in a thoughtful manner and the mathematics is correct, up to 1-2 minor errors which do not call into question your understanding of the calculus concepts.</td>
</tr>
<tr>
<td>P</td>
<td>The submission is complete, neatly written up, and partial understanding of concepts is evident, but there are issues in the writing, mathematics, or reasoning that require revision.</td>
</tr>
<tr>
<td>I</td>
<td>The submission has significant omissions or widespread issues so that not enough information is present to determine whether there is adequate understanding.</td>
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</table>

**Online Homework**: Online homework will be graded automatically through WeBWorK using points. One point is awarded when the problem is correct (or, in the case of some multiple-part problems, when each part is correct), and zero points are awarded otherwise. Partial credit may be given in some multi-part problems.

Revision and Reassessment

**Online Homework**: You may reattempt any online homework set as many times as you want until the deadline for the set. After this deadline, no revision is allowed and your grade on that set is final.

**Labs**: If you receive a grade of Unsatisfactory (U) on a submitted lab, you will receive feedback on your work which you can use to make corrections and then resubmit your work for regrading. Your lab resubmissions are due by the date listed on your lab grade feedback, typically one week after the graded lab is returned.

**Learning Targets**: Learning targets (LTs) will be assessed on weekly quizzes as well as on exams. You may reattempt any LT that receives a Progressing or Incomplete grade in two ways:

1. Reattempt a LT during an exam or during certain designated weekly quizzes. Note that you will not be allowed to reattempt any LT on every quiz; I will specify ahead of time which LTs will be assessed on each quiz. During exams, on the other hand, all LTs will be available for reattempting.
2. Reattempt a LT on specified reassessment weeks by scheduling a “reassessment quiz” with me ahead of time, subject to the following restrictions:
   - You may reattempt at most three LTs in a given reassessment week. The reassessment weeks are: February 19 – 23, March 21 – 27, April 22 – 26
   - You must schedule a reassessment of a LT by completing the appropriate sign-up form on D2L (available before each reassessment week as a quiz in D2L) or emailing me the LT(s) you wish to reattempt AND what you have done to prepare for that reassessment, by the given sign-up deadline on D2L.

   **More information** about reassessment weeks will be announced before the first reassessment week.

LT assessments to attain Mastery may also be done in the above ways with the exception that your first attempt at attaining Mastery of a LT must occur on an exam.
### Learning Targets
Below are the learning targets for our course, divided into Core and Supplemental sections. Boxes have been provided as a way to track your progress throughout the semester: Check off one of the boxes to the left of a learning target once your performance on that target merits a Satisfactory (S) score to indicate proficiency in that target. Check off the second box upon receiving a second score of Satisfactory on that target to indicate mastery.

#### Core Learning Targets

<table>
<thead>
<tr>
<th></th>
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<th>C1</th>
<th>Limits: Graphical. Compute the limit of a function at a specific point using the graph of the function, or sketch a graph of a function satisfying certain limit properties. (2.2)</th>
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<tbody>
<tr>
<td></td>
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<td>C2</td>
<td>Continuity. Using the appropriate limit definitions, determine and justify whether a function (given graphically or by a formula) is continuous, and classify any discontinuities as removable, jump, or infinite. Also, correctly apply the substitution method, if it applies. (2.4)</td>
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<td>C3</td>
<td>Tangent lines. Find the equation of a tangent line to a function at a point, and use the tangent line to approximate function values. (3.1, 4.1)</td>
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<td>C4</td>
<td>Derivatives using the definition. State and use the limit definition of a derivative (at a point or in general) to find derivatives. (3.1, 3.2)</td>
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<td>C5</td>
<td>Rates of Change. Distinguish between, interpret, and compute average and instantaneous rates of change in applied scenarios. (2.1, 3.4)</td>
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<td>C6</td>
<td>Derivatives of basic functions. Properly evaluate derivatives of basic functions (constant functions, polynomials, exponentials, and trigonometric functions). (3.2, 3.6)</td>
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<td>C7</td>
<td>Product and Quotient Rules. Properly apply the Product and Quotient Rules to find derivatives. (3.3)</td>
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<td></td>
<td>C8</td>
<td>Chain Rule. Properly apply the Chain Rule to find derivatives. (3.7)</td>
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<td></td>
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<td>C9</td>
<td>Local information of functions: Graphical. Given the graph of a function or its derivative, identify intervals of increase and decrease, concavity, local extrema, critical points, and inflection points. Alternatively, use local information and end behavior to sketch a graph of a function. (4.3, 4.4, 4.6)</td>
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<td>C10</td>
<td>Applied optimization. Set up and solve applied optimization problems. (4.7)</td>
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<td>C11</td>
<td>Areas and integrals. Interpret areas under graphs as definite integrals, and use a graph of a function to compute a definite integral. (5.1, 5.2)</td>
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<td></td>
<td></td>
<td>C12</td>
<td>Fundamental Theorem of Calculus. Use the Fundamental Theorem of Calculus to compute definite integrals. (5.4)</td>
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</table>

#### Supplemental Learning Targets

<table>
<thead>
<tr>
<th></th>
<th></th>
<th>S1</th>
<th>Limits: Symbolic. Evaluate limits using basic limit laws. (2.3)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>S2</td>
<td>Indeterminate forms and algebraic methods. Evaluate limits of indeterminate forms algebraically. (2.5, 2.6, 2.7)</td>
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<td>S3</td>
<td>Limits at infinity. Determine the end behavior of a function by considering limits at infinity. (2.7)</td>
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<td>S4</td>
<td>Derivatives: Graphical. Sketch and/or identify the graph of the derivative of a function using the graph of the original function, or vice versa, correctly attending to possible issues with differentiability at points. (3.1, 3.2)</td>
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<td>S5</td>
<td>Implicit differentiation. Compute derivatives of functions given implicitly. (3.8)</td>
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<td>S6</td>
<td>Derivatives of inverse functions. Compute derivatives of inverse functions, including logarithmic and inverse trigonometric functions. (3.9)</td>
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<td>S7</td>
<td>Related rates. Set up and solve related rates problems. (3.10)</td>
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<td>S8</td>
<td>Absolute extrema. Find absolute extrema of a continuous function on a closed interval. (4.2)</td>
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<td>S9</td>
<td>Local information of functions: Symbolic. Given the formula for a function, identify intervals of increase and decrease, concavity, local extrema, critical points, and inflection points. (4.3, 4.4)</td>
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<td></td>
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<td>S10</td>
<td>Indeterminate forms and l'Hôpital's Rule. Evaluate limits of indeterminate forms using l'Hôpital's Rule. (4.5)</td>
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<td></td>
<td></td>
<td>S11</td>
<td>Approximating definite integrals. Approximate a definite integral on a closed interval using left-endpoint, right-endpoint, and midpoint approximations. (5.1)</td>
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<tr>
<td></td>
<td></td>
<td>S12</td>
<td>Antiderivatives of basic functions. Compute general antiderivatives (i.e., indefinite integrals) of basic functions (constant functions, polynomials, trigonometric functions, exponential functions). (5.3)</td>
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<td></td>
<td></td>
<td>S13</td>
<td>Initial value problems. Solve simple initial value problems. (5.3)</td>
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<td>S14</td>
<td>Substitution method for integration. Evaluate definite and indefinite integrals using the substitution method. (5.7)</td>
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</tbody>
</table>
### Suggested Exercises and Course Outline

Below are suggested exercises from each section we will discuss. While these exercises will not be collected, they will provide an excellent source of practice outside of class as you work to master each learning topic.

<table>
<thead>
<tr>
<th>MATH 2313 – Calculus I Topics</th>
<th>Rogawski/Adams/Franzosa, 4th edition</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.2 Investigating Limits</td>
<td>p.73: 1, 5-7, 9-55 odds, 56, 57</td>
</tr>
<tr>
<td>2.3 Basic Limit Laws</td>
<td>p.78: 1-35 odds, 36, 37</td>
</tr>
<tr>
<td>2.4 Limits and Continuity</td>
<td>p.82: 1-6, 1-57 every other odd (eoo), 65-81 eoo</td>
</tr>
<tr>
<td>2.5 Evaluating Limits Algebraically</td>
<td>p.94: 1-53 eoo, 28, 34</td>
</tr>
<tr>
<td>2.6 Trig Limits</td>
<td>p.93: 1-57 eoo</td>
</tr>
<tr>
<td>2.7 Limits at Infinity</td>
<td>p.105: 1-4, 7-15 odds, 16-41 eoo</td>
</tr>
<tr>
<td>2.8 Intermediate Value Theorem</td>
<td>p.110: 1-17 eoo, 19, 25-28</td>
</tr>
<tr>
<td>Exam 1</td>
<td></td>
</tr>
<tr>
<td>3.1 Definition of Derivative</td>
<td>p.129: 1-7 odds, 9-12, 13-16 (great for S4!), 21, 23, 24, 29-45 odds, 47 &amp; 49 (also great for S4), 57-61 odds</td>
</tr>
<tr>
<td>3.2 Derivative as a Function</td>
<td>p.142: 1-45 eoo, 47, 54-57, 70-72, 74</td>
</tr>
<tr>
<td>3.3 Product and Quotient Rules</td>
<td>p.150: 1-47 odds</td>
</tr>
<tr>
<td>3.4 Rates of Change</td>
<td>From Section 2.1: p.65: 1-10; From Section 3.4: p.159: 1-7 odds, 9-11, 26, 27, 30, 41</td>
</tr>
<tr>
<td>3.5 Higher Derivatives</td>
<td>p.166: 1-33 eoo, 39, 40</td>
</tr>
<tr>
<td>3.6 Trigonometric Functions</td>
<td>p.171: 1-49 eoo, 43, 44</td>
</tr>
<tr>
<td>3.7 Chain Rule</td>
<td>p.178: 1-73eoo, 75, 89, 90, 92-96</td>
</tr>
<tr>
<td>3.8 Implicit Differentiation</td>
<td>p.186: 1-69 eoo</td>
</tr>
<tr>
<td>3.9 Derivatives of Log and Exp</td>
<td>p.196: 1-49 eoo</td>
</tr>
<tr>
<td>3.10 Related Rates</td>
<td>p.202: 1-8, 13-37eoo (at a minimum!)</td>
</tr>
<tr>
<td>Exam 2</td>
<td></td>
</tr>
<tr>
<td>4.1 Linear Approximation &amp; Applications</td>
<td>p.218: 21-28</td>
</tr>
<tr>
<td>4.2 Extreme Values</td>
<td>p.227: 1-57 eoo, 91-93</td>
</tr>
<tr>
<td>4.3 Mean Value Theorem, Monotonicity</td>
<td>p.236: 1-61 eoo, 19, 24, 25</td>
</tr>
<tr>
<td>4.4 Shape of a Graph</td>
<td>p.243: 1, 2, 5-21 eoo, 22, 28-30, 33-61eoo, 63, 64-66</td>
</tr>
<tr>
<td>4.5 L'Hopital's Rule</td>
<td>p.252: 1-49 eoo</td>
</tr>
<tr>
<td>Exam 3</td>
<td></td>
</tr>
<tr>
<td>5.1 Approximating and Computing Area</td>
<td>p.294: 5, 9, 13, 15-21 odds</td>
</tr>
<tr>
<td>5.2 Definite Integral</td>
<td>p.307: 1-9 odds, 13-15, 35-47 odds, 57-64, 71, 72</td>
</tr>
<tr>
<td>5.3 Indefinite Integral</td>
<td>p.316: 1-45 eoo, IVPs: 47-59 eoo</td>
</tr>
<tr>
<td>5.4 Fundamental Theorem of Calculus, I</td>
<td>p.323: 1-53 eoo</td>
</tr>
<tr>
<td>5.5 Fundamental Theorem of Calculus, II</td>
<td>p.330: 1-41 eoo</td>
</tr>
<tr>
<td>5.7 Substitution Method</td>
<td>p.344: 1-97 eoo</td>
</tr>
<tr>
<td>Exam 4</td>
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**NOTE:** I, Dr. Falahola, reserve the right to make changes to any part of this syllabus as necessary, in the interest of the class. Students will be notified of any changes via email and in class.
The following is an excerpt from SFA Policy 5.4:
The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;

2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

Academic Integrity
The Code of Student Conduct and Academic Integrity outlines the prohibited conduct by any student enrolled in a course at SFA. It is the responsibility of all members of all faculty, staff, and students to adhere to and uphold this policy.

Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

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Need More Information?
See [https://math.sfasu.edu/docs/syllabi/MATH2313Syllabus.pdf](https://math.sfasu.edu/docs/syllabi/MATH2313Syllabus.pdf) for elements common to all sections.
Questions about Standards-Based Grading:
Use the space below to jot down any questions you have over the grading system. See if this syllabus addresses your question first, then if further clarification is needed, please ask me for an explanation.
Math 2313 – Calculus I
Course Syllabus

Course description: Topics include limits, continuity, differential calculus of algebraic and transcendental functions with applications, basic antidifferentiation with substitution, definite integrals.

Core Objectives (CO):
1. Critical Thinking [CO 1]: to include creative thinking, innovation, inquiry, and analysis, evaluation and synthesis of information
2. Communication Skills [CO 2]: to include effective development, interpretation and expression of ideas through written, oral and visual communication
3. Empirical and Quantitative Skills [CO 3]: to include the manipulation and analysis of numerical data or observable facts resulting in informed conclusions

Credit hours: 3

The following is an excerpt from SFA Policy 5.4:
The federal definition of a credit hour is an amount of work represented in intended learning outcomes and verified by evidence of student achievement that is an institutionally established equivalency that reasonably approximates:

1. Not less than one hour of classroom or direct faculty instruction and a minimum of two hours out-of-class student work each week for approximately fifteen weeks for one semester or trimester hour of credit, or 10 to 12 weeks for one quarter hour of credit, or the equivalent amount of work over a different amount of time, or;

2. At least an equivalent amount of work as outlined in item 1 above for other academic activities as established by the institution including laboratory work, internships, practica, studio work, and other academic work leading to the award of credit hours.

To this end, all students in courses offered by the Department of Mathematics and Statistics that wish to be successful should plan to spend a minimum of two hours outside of class for every credit hour associated with this course. Expected activities to be completed in the time outside of class include reviewing notes from previous class meetings, reading assigned course resources, completing all assigned exercises and projects, and performing periodic assessment preparation.

Course Prerequisites and Corequisites: MATH 1318 or MATH 2212

General Education Core Curriculum: This course has been selected to be part of SFA’s core curriculum. The Texas Higher Education Coordinating Board has identified six objectives for all core courses: Critical Thinking Skills, Communication Skills, Empirical and Quantitative Skills, Teamwork, Personal Responsibility, and Social Responsibility. SFA is committed to the improvement of its general education core curriculum by regular assessment of student performance on these six objectives. Assessment of these objectives at SFA will be based on student work from all core curriculum courses. This student work will be collected in D2L, the assessment management system selected by SFA to collect student work for core assessment.

By enrolling in MATH 2313/2113 Calculus I you are also enrolling in a Core Curriculum Course that fulfills the Mathematics Core Objective requirement.

The chart below indicates: (a) The core objectives that are required to be taught in this course per the Texas Higher Education Coordinating Board (THECB), (b) How the required core objectives will be addressed.
Core Curriculum Objective Table

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**Course outline:**

- **Limits and continuity [CO 1, 2, 3]**
  - Limits at a point
    - Formal definition
    - Existence
    - Infinite limits/vertical asymptotes
  - Limits to infinity/horizontal asymptotes
  - Algebraic evaluation
    - Basic rules/techniques
    - Sandwich Theorem
    - Continuity/Intermediate Value Theorem

- **Derivatives and antiderivatives [CO 1, 2, 3]**
  - Definition of derivative/interpretations
  - Derivative rules
    - Basic rules
    - Transcendental rules
    - Product and Quotient rules
    - Chain rule/implicit differentiation
  - Antiderivative rules
    - Basic rules
    - Transcendental rules
    - Substitution

- **Applications of derivatives [CO 1, 2, 3]**
  - Related rates
  - Position, velocity, and acceleration
  - Extreme values/optimization

Approximate time spent:
- Limits and continuity [CO 1, 2, 3] 30%
- Derivatives and antiderivatives [CO 1, 2, 3] 30%
- Applications of derivatives [CO 1, 2, 3] 25%
Mean Value Theorem
Curve sketching
Newton’s method
L’Hospital’s Rule

Definite integration [CO 1, 2, 3] 10%
Definition of the definite integral/interpretations (area, etc.)
Riemann sums
The Fundamental Theorem of Calculus
Definite integrals with substitution

Explicit instruction in Critical Thinking, Communication and Empirical and Quantitative Reasoning is in addition to implicit instruction, modeling and practice that occur daily in the discussion of limits and continuity, derivatives and antiderivatives, applications of derivatives and definite integration. This explicit instruction includes explanation of solving mathematical problems by thinking critically, communicating logically ordered solutions with complete and correct notation, and applying empirical or quantitative skills as appropriate to the problem.

Program Learning Outcomes: Students graduating from SFA with a B.S. Degree and a major in mathematics will:

1. Written Communication - SFA Mathematics majors communicate mathematical ideas effectively in written form, integrating mathematical notation correctly and consistently.

2. Verbal Communication - SFA Mathematics majors communicate mathematics effectively to diverse audiences.

3. Mathematical Maturation - SFA Mathematics majors grow from a computational understanding of mathematics to an integrated approach which includes critical thinking proficiency, computational facility, conceptual understanding, and problem-solving persistence.

Student Learning Outcomes (SLO): At the end of MTH 233, a student who has studied and learned the material should be able to:

1. Find limits using graphs, algebraic techniques, and L’Hopital's Rule. [PLO:1,23], [CO: 1,3]

2. Demonstrate an understanding of the connection between limits and asymptotic behavior in functions. [PLO: 1,2,3] , [CO: 1,2,3]

3. Recognize and construct continuous functions. [PLO: 1,2,3], [CO: 1,3]

4. Connect the definitions of the derivative and definite integral to their geometric interpretations and applications. [PLO: 1,2,3], [CO: 1,3]

5. Find derivatives and antiderivatives of algebraic and transcendental functions, including compositions of functions. [PLO: 1,2,3], [CO:1,3]

6. Use implicit differentiation to solve related rates problems and to determine derivative rules for inverse transcendental functions. [PLO: 1,2,3], [CO:1,3]

7. Use information revealed by limits and derivatives to sketch graphs of functions and find extreme values of functions on given intervals. [PLO: 1,2,3], [CO: 1,2,3]

8. Convey the connections between limits, derivatives, and integrals. [PLO: 1,2,3], [CO: 1,3]

9. Use the Fundamental Theorem of Calculus to evaluate definite integrals. [PLO: 1,2,3], [CO: 1,3]

This course meets educator preparation standards for one or more certification programs; a complete listing of all the educator preparation standards this course meets can be found at: https://sfasu.edu/docs/jacksteach/jacksteach-standards-alignment-chart.xlsx.

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**Withheld Grades Semester Grades (SFA Policy 5.5)**
Ordinarily, at the discretion of the instructor of record and with the approval of the academic chair/director, a grade of WH will be assigned only if the student cannot complete the course work because of unavoidable circumstances. Students must complete the work within one calendar year from the end of the semester in which they receive a WH, or the grade automatically becomes an F. If students register for the same course in future terms the WH will automatically become an F and will be counted as a repeated course for the purpose of computing the grade point average. The circumstances precipitating the request must have occurred after the last day in which a student could withdraw from a course. Students requesting a WH must be passing the course with a minimum projected grade of C. For additional information, go to https://www.sfasu.edu/policies/course-grades-5.5.pdf.

**Students with Disabilities**
To obtain disability related accommodations, alternate formats and/or auxiliary aids, students with disabilities must contact the Office of Disability Services (ODS), Human Services Building, and Room 325, 468-3004 / 468-1004 (TDD) as early as possible in the semester. Once verified, ODS will notify the course instructor and outline the accommodation and/or auxiliary aids to be provided. Failure to request services in a timely manner may delay your accommodations. For additional information, go to http://www.sfasu.edu/disabilityservices.

**Student Wellness and Well-Being**
SFA values students’ overall well-being, mental health and the role it plays in academic and overall student success. Students may experience stressors that can impact both their academic experience and their personal well-being. These may include academic pressure and challenges associated with relationships, emotional well-being, alcohol and other drugs, identities, finances, etc.

If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**
**The Dean of Students Office** (Rusk Building, 3rd floor lobby)
www.sfasu.edu/deanofstudents
936.468.7249
dos@sfasu.edu

**SFA Human Services Counseling Clinic** Human Services, Room 202
www.sfasu.edu/humanservices/139.asp
936.468.1041

**The Health and Wellness Hub** “The Hub”
Location: corner of E. College and Raguet St.

sfasu.edu/math
To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

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- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- Crisis Text Line: Text HELLO to 741-741

Acceptable Student Behavior

Classroom behavior should not interfere with the instructor’s ability to conduct the class or the ability of other students to learn from the instructional program (see the Student Conduct Code, policy 10.4). Unacceptable or disruptive behavior will not be tolerated. Students who disrupt the learning environment may be asked to leave class and may be subject to judicial, academic or other penalties. This prohibition applies to all instructional forums, including electronic, classroom, labs, discussion groups, field trips, etc. The instructor shall have full discretion over what behavior is appropriate/inappropriate in the classroom.

Date of document: 08/23/2023
Math 2113 – Calculus I (Lab)
Course Syllabus

Course description: Limits, continuity, differential calculus of algebraic and transcendental functions with applications, basic antidifferentiation with substitution, definite integrals.

Credit hours: 1

Course Prerequisites and Corequisites: Prereq MATH 1318 or MATH 2212, corequisite MATH 2313

Course outline:

- Limits and continuity
  - Limits at a point
    - Formal definition
    - Existence
    - Infinite limits/vertical asymptotes
  - Limits to infinity/horizontal asymptotes
  - Algebraic evaluation
    - Basic rules/techniques
    - Sandwich Theorem
  - Continuity/Intermediate Value Theorem

- Derivatives and antiderivatives
  - Definition of derivative/interpretations
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- Applications of derivatives
  - Related rates
  - Position, velocity, and acceleration
  - Extreme values/optimization
  - Mean Value Theorem
  - Curve sketching
  - Newton’s method
  - L'Hopital's Rule

- Definite integration
  - Definition of the definite integral/interpretations (area, etc.)
  - Riemann sums
  - The Fundamental Theorem of Calculus
  - Definite integrals with substitution

Approximate time spent

- Limits and continuity: 30%
- Derivatives and antiderivatives: 30%
- Applications of derivatives: 30%
- Definite integration: 10%
Program Learning Outcomes (PLO): Students graduating from SFA with a B.S. Degree and a major in mathematics will:

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Student Learning Outcomes (SLO): At the end of MATH 2313/2113, a student who has studied and learned the material should be able to:

1. Find limits using graphs, algebraic techniques, and L'Hopital's Rule. [PLO: 1,2,3], [EEO: 2, 4, 5]
2. Demonstrate an understanding of the connection between limits and asymptotic behavior in functions. [PLO: 1,2,3], [EEO: 2, 3, 5]
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4. Connect the definitions of the derivative and definite integral to their geometric interpretations and applications. [PLO: 1,2,3], [EEO: 1, 2, 5]
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9. Use the Fundamental Theorem of Calculus to evaluate definite integrals. [PLO: 1,2,3], [EEO: 1, 4, 5]

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  - Definition of the definite integral/interpretations (area, etc.)
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  - The Fundamental Theorem of Calculus
  - Definite integrals with substitution

- **Explicit instruction in Critical Thinking, Communication and Empirical and Quantitative Reasoning** is in addition to implicit instruction, modeling and practice that occur daily in the discussion of limits and continuity, derivatives and antiderivatives, applications of derivatives and definite integration. This explicit instruction includes explanation of solving mathematical problems by thinking critically, communicating logically ordered solutions with complete and correct notation, and applying empirical or quantitative skills as appropriate to the problem.

**Program Learning Outcomes**: Students graduating from SFA with a B.S. Degree and a major in mathematics will:

1. Written Communication - SFA Mathematics majors communicate mathematical ideas effectively in written form, integrating mathematical notation correctly and consistently.

2. Verbal Communication - SFA Mathematics majors communicate mathematics effectively to diverse audiences.

3. Mathematical Maturation - SFA Mathematics majors grow from a computational understanding of mathematics to an integrated approach which includes critical thinking proficiency, computational facility, conceptual understanding, and problem-solving persistence.

**Student Learning Outcomes (SLO)**: At the end of MTH 233, a student who has studied and learned the material should be able to:

1. Find limits using graphs, algebraic techniques, and L’Hospital’s Rule. [PLO:1,23], [CO: 1,3]
2. Demonstrate an understanding of the connection between limits and asymptotic behavior in functions. [PLO: 1,2,3], [CO: 1,2,3]
3. Recognize and construct continuous functions. [PLO: 1,2,3], [CO: 1,3]
4. Connect the definitions of the derivative and definite integral to their geometric interpretations and applications. [PLO: 1,2,3], [CO: 1,3]
5. Find derivatives and antiderivatives of algebraic and transcendental functions, including compositions of functions. [PLO: 1,2,3], [CO:1,3]
6. Use implicit differentiation to solve related rates problems and to determine derivative rules for inverse transcendental functions. [PLO: 1,2,3], [CO:1,3]
7. Use information revealed by limits and derivatives to sketch graphs of functions and find extreme values of functions on given intervals. [PLO: 1,2,3], [CO: 1,2,3]
8. Convey the connections between limits, derivatives, and integrals. [PLO: 1,2,3], [CO: 1,3]
9. Use the Fundamental Theorem of Calculus to evaluate definite integrals. [PLO: 1,2,3], [CO: 1,3]

This course meets educator preparation standards for one or more certification programs; a complete listing of all the educator preparation standards this course meets can be found at: https://sfasu.edu/docs/jacksteach/jacksteach-standards-alignment-chart.xlsx.

**Academic Integrity**

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Articles IV, VI, and VII of the new Code of Student Conduct and Academic Integrity outline the violations and procedures concerning academic conduct, including cheating, plagiarism, collusion, and misrepresentation. Cheating includes, but is not limited to: (1) Copying from the test paper (or other assignment) of another student, (2) Possession and/or use during a test of materials that are not authorized by the person giving the test, (3) Using, obtaining, or attempting to obtain by any means the whole or any part of a
non-administered test, test key, homework solution, or computer program, or using a test that has been administered in prior classes or semesters without permission of the Faculty member, (4) Substituting for another person, or permitting another person to substitute for one’s self, to take a test, (5) Falsifying research data, laboratory reports, and/or other records or academic work offered for credit, (6) Using any sort of unauthorized resources or technology in completion of educational activities.

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**Withheld Grades Semester Grades (SFA Policy 5.5)**
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If you are experiencing concerns, seeking help, SFA provides a variety of resources to support students’ mental health and wellness. Many of these resources are free, and all of them are confidential.

**On-campus Resources:**
- **The Dean of Students Office** (Rusk Building, 3rd floor lobby)
  - [www.sfasu.edu/deanofstudents](http://www.sfasu.edu/deanofstudents)
  - 936.468.7249
  - dos@sfasu.edu

- **SFA Human Services Counseling Clinic** Human Services, Room 202
  - [www.sfasu.edu/humanservices/139.asp](http://www.sfasu.edu/humanservices/139.asp)
  - 936.468.1041

- **The Health and Wellness Hub** “The Hub”
  Location: corner of E. College and Raguet St.
  - [sfasu.edu/math](http://sfasu.edu/math)
To support the health and well-being of every Lumberjack, the Health and Wellness Hub offers comprehensive services that treat the whole person – mind, body and spirit. Services include:

- Health Services
- Counseling Services
- Student Outreach and Support
- Food Pantry
- Wellness Coaching
- Alcohol and Other Drug Education

[www.sfasu.edu/thehub](http://www.sfasu.edu/thehub)
936.468.4008
thehub@sfasu.edu

**Crisis Resources:**

- Burke 24-hour crisis line: 1.800.392.8343
- National Suicide Crisis Prevention: 9-8-8
- Suicide Prevention Lifeline: 1.800.273.TALK (8255)
- Crisis Text Line: Text HELLO to 741-741

**Acceptable Student Behavior**

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*Date of document: 08/23/2023*
Math 2113 – Calculus I (Lab)
Course Syllabus

Course description: Limits, continuity, differential calculus of algebraic and transcendental functions with applications, basic antidifferentiation with substitution, definite integrals.

Credit hours: 1

Course Prerequisites and Corequisites: Prereq MATH 1318 or MATH 2212, corequisite MATH 2313

Course outline:

- Limits and continuity
  - Limits at a point
    - Formal definition
    - Existence
    - Infinite limits/vertical asymptotes
  - Limits to infinity/horizontal asymptotes
  - Algebraic evaluation
    - Basic rules/techniques
    - Sandwich Theorem
  - Continuity/Intermediate Value Theorem
- Derivatives and antiderivatives
  - Definition of derivative/interpretations
  - Derivative rules
    - Basic rules
    - Transcendental rules
    - Product and Quotient rules
    - Chain rule/implicit differentiation
  - Antiderivative rules
    - Basic rules
    - Transcendental rules
    - Substitution
- Applications of derivatives
  - Related rates
  - Position, velocity, and acceleration
  - Extreme values/optimization
  - Mean Value Theorem
  - Curve sketching
  - Newton’s method
  - L’Hospital’s Rule
- Definite integration
  - Definition of the definite integral/interpretations (area, etc.)
  - Riemann sums
  - The Fundamental Theorem of Calculus
  - Definite integrals with substitution

Approximate time spent

- Limits and continuity: 30%
- Derivatives and antiderivatives: 30%
- Applications of derivatives: 30%
- Definite integration: 10%
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Student Learning Outcomes (SLO): At the end of MATH 2313/2113, a student who has studied and learned the material should be able to:

1. Find limits using graphs, algebraic techniques, and L'Hopital's Rule. [PLO: 1,2,3], [EEO: 2, 4, 5]
2. Demonstrate an understanding of the connection between limits and asymptotic behavior in functions. [PLO: 1,2,3] , [EEO: 2, 3, 5]
3. Recognize and construct continuous functions. [PLO: 1,2,3] , [EEO: 2, 5]
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