I. COURSE INFORMATION

Instructor: George Tintera
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Office Address: CI 303
Office Hours: TBA. Subject to rescheduling due to meetings. Also by appointment.
E-mail address: george.tintera@tamucc.edu
Time & Location: MWF 9 to 9:50, CI 122
Final Exam: Monday, December 8, 8 to 10:30 am

II. COURSE DESCRIPTION

The main concepts covered in this class are limits of functions, continuity of a function, the derivative of a function, and an introduction to the integral of a function.

III. PREREQUISITES

Math 1314 (College Algebra) and Math 1316 (Trigonometry), or Math 2312 (Pre-calculus), or placement beyond Math 2312.

IV. TEXT AND OTHER SUPPLIES REQUIRED

The required textbook for the course is Calculus (Early Transcendentals), by Stewart, 7th edition. A graphing calculator will be needed in this course. I will support the TI-84, but in general you can use any graphing calculator. All the necessary class demonstrations will be done with a TI-84. You will also have assignments in Webassign. Access is available for purchase at the bookstore or online.

V. STUDENT LEARNING OUTCOMES

At the end of the course the student should:

1. Understand and use the concept of the limit of a function.
   a. Use properties of limits and other techniques, like L’Hopital’s rule, to determine the existence or not of the limit of a function at a given value;
   b. Understand the definition of continuity of functions
      i. From a function given a graph determine the discontinuity point indicating which properties of continuity fail, and
      ii. From a given piece-wise function defined by formulas determine the points at which the function is discontinuous.

2. Be able to provide examples and counterexamples dealing with important results discussed in this course, and especially to understand the necessity of the conditions for some of them:
   a. Give an example of a function which does not satisfy the Intermediate Value Theorem (IVT),
   b. Give an example of a function which does not satisfy the Mean Value Theorem (MVT),
   c. Give an example of a discontinuous function with a removable/non-removable discontinuity,
   d. Give an example of a function whose limit does not exist at a point,
   e. Give an example of a function that is continuous but not differentiable at a point.
3. Understand and interpret the concept of the derivative:
   a. Graphically, as the slope of the tangent line at a point,
   b. Analytically, as the instantaneous rate of change of the function,
   c. Use information about the first and second derivative to obtain information about the original function, interpret the units of the derivative,
   d. Points where the function is increasing the fastest, where it is constant, etc.,
   e. From a given graph determine all the critical points and indicate at which the function is not differentiable,
   f. From a function defined piecewise determine whether or not the function is differentiable at the point(s) where the pieces join,

4. Find the linear approximation of a function at a differentiable point and use it to estimate the function.
   a. Produce the linear approximation from a graph and determine if in a neighborhood of the point it will give an overestimate or underestimate,
   b. From a function defined by an algebraic expression find the linear approximation at a given point and use it to estimate the original function and justify whether it is an overestimate or underestimate.

5. Sketch the graph of a function or its derivative function:
   a. From the graph of a function, produce the graphs of the first and second derivative functions,
   b. From the graph or information about the first and second derivative of a function, generate the graph of the function,
   c. From a function defined by a formula find the information to sketch its graph (domain, continuity points, increasing/decreasing intervals, concave up/down, end behavior, asymptotes).

6. Use calculus techniques to find the solution of standard applications
   a. Given an optimization problem, find a mathematical model for it and solve it using techniques from calculus, and
   b. Related rate problems.

7. Use implicit differentiation:
   a. Calculate derivatives using implicit differentiation,
   b. Determine the equation of tangent lines to graphs obtained from expressions where one variable is given implicitly as the function of the other.

8. Understand the concept of the integral:
   a. Interpret the units of the integral in the solution of problems,
   b. Evaluate basic definite integrals,
   c. Calculate the area of regions by using integration,
   d. Interpret integrals as area to evaluate them,
   e. Estimate integrals using Riemann Sums,
   f. Use the Fundamental Theorem of Calculus to understand the relationship between integration and differentiation.

VI. INSTRUCTIONAL METHODS & ACTIVITIES

Methods and activities for instruction include: Lectures, calculator demonstrations and group activities. Students will complete practice materials online and do and submit homework online. Help will be available from the instructor during office hours, through email and through MyMathLab. Tutoring is also available on campus.
VII. EVALUATION & GRADE ASSIGNMENT

The methods of evaluation and the criteria for grade assignments are:

<table>
<thead>
<tr>
<th>Homework</th>
<th>(15%)</th>
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<tbody>
<tr>
<td>Mastery Quizzes</td>
<td>(15%)</td>
</tr>
<tr>
<td>Three Chapter Tests</td>
<td>(30%)</td>
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<tr>
<td>Labs</td>
<td>(20%)</td>
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<tr>
<td>Final Exam</td>
<td>(20%)</td>
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Homework: After practicing materials in Webassign, students will have access to homework problems in the system. After working the problems on paper with pencil and calculator, answers are entered and then scored. Homework will be assigned from Chapter 1 but that is strictly for practice and carries no weight in the final grade.

Quizzes: There will be regular paper assignments and quizzes to check for understanding of the homework. They will administered in class in MASTERY format. A score of 80% or better is needed for credit. They may be repeated as needed, up to two times.

Chapter Tests: There will be three tests during the semester. Students may use paper, pencil and a graphing calculator but are on their honor to not use any notes, books, resources or help from another person.

Labs: Students will work through each of 13 to 14 sets of ‘lab’ materials during the assigned lab times. The reports will be graded on correctness, conclusions and presentation. There will also be quizzing and recitation taking place during those lab meetings.

Final Exam: The final exam will be comprehensive. It will be held Thursday, December 12, 4:30 to 7 pm in the regular classroom. Students with unexcused absences from the exam will have earned a score of 0.

VIII. TENTATIVE COURSE SCHEDULE

<table>
<thead>
<tr>
<th>Class</th>
<th>Week of</th>
<th>Sections</th>
<th>Topics</th>
<th>Lab</th>
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<tbody>
<tr>
<td>1</td>
<td>Aug 25</td>
<td>Chapter 1</td>
<td>Review of Functions</td>
<td></td>
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<tr>
<td>2 3</td>
<td>Sept 1</td>
<td>Chapter 1, 2.1, 2.2</td>
<td>Functions and Models, Tangent and Velocity Problems, Limits</td>
<td>1</td>
</tr>
<tr>
<td>4 5</td>
<td>Sept 8</td>
<td>2.3, 2.5, 2.6</td>
<td>Limits, continuity and asymptotes</td>
<td>2</td>
</tr>
<tr>
<td>6 7</td>
<td>Sept 15</td>
<td>2.7, 2.8, 3.1</td>
<td>Derivatives at a point and as functions, basic rules for derivatives as functions</td>
<td>3</td>
</tr>
<tr>
<td>8 9</td>
<td>Sept 22</td>
<td></td>
<td>Product and Quotient Rules, Test #1</td>
<td>4</td>
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<tr>
<td>10 11</td>
<td>Sept 29</td>
<td>3.3, 3.4,</td>
<td>Derivatives of Trigonometric functions, the Chain Rule</td>
<td>5</td>
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<tr>
<td>12 13</td>
<td>Oct 6</td>
<td>3.5-3.7</td>
<td>Implicit Differentiation; Derivatives of Inverse Functions and Logarithms, Derivatives of Inverse Trigonometric Functions</td>
<td>6</td>
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<tr>
<td>14 15</td>
<td>Oct 13</td>
<td>3.9-3.10</td>
<td>Related Rates, Linear Approximation and Differentials</td>
<td>7</td>
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<tr>
<td>16 17</td>
<td>Oct 20</td>
<td>Chapter 3</td>
<td>Review, Test #2</td>
<td>8</td>
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<tr>
<td>18 19</td>
<td>Oct 27</td>
<td>4.1-4.3</td>
<td>Extreme Values of Functions; The Mean Value Theorem, Graphs and Derivatives</td>
<td>9</td>
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<tr>
<td>20 21</td>
<td>Nov 3</td>
<td>4.4,4.5,4.7</td>
<td>Curve Sketching Optimization</td>
<td>10</td>
</tr>
<tr>
<td>22 23</td>
<td>Nov 10</td>
<td>4.9, 5.1,5.2</td>
<td>Anti-derivatives, Introduction to Integrals</td>
<td>11</td>
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<tr>
<td>24</td>
<td>Nov 17</td>
<td>5.3, 5.4, 5.5</td>
<td>The Fundamental Theorem of Calculus, Integrals as functions; Indefinite Integrals, net change, Substitution</td>
<td>12</td>
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<tr>
<td>25 26</td>
<td>Nov 24</td>
<td></td>
<td>Test 3, Thanksgiving Break</td>
<td>12</td>
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<tr>
<td>27</td>
<td>12/9</td>
<td></td>
<td>REVIEW; Final Exam: December 4, 8 to 10:30 am</td>
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IX. CLASS POLICIES and ANNOUNCEMENTS

• Students are expected to be diligent and adhere to the deadlines in the course schedule.
• If you have any questions please email or see me during office hours.
• You are expected to conduct yourself in accordance with the highest standards of academic honesty. When you turn in work for a grade you attest that the work is your own work. The policies about academic dishonesty outlined in the Undergraduate Catalog or Student Handbook apply: academic dishonesty results in zero points on the test or assignment and the incident will be reported to the appropriate authorities, which may impose further sanctions.

• Academic Integrity/Plagiarism: University students are expected to conduct themselves in accordance with the highest standards of academic honesty. Academic misconduct for which a student is subject to penalty includes all forms of cheating, such as illicit possession of examinations or examination materials, falsification, forgery, complicity or plagiarism. (Plagiarism is the presentation of the work of another as one’s own work.) In this class, academic misconduct or complicity in an act of academic misconduct on an assignment or test will result in a grade of zero (0) on that assignment or an F in the class, depending on circumstances.

• Dropping a Class: I hope that you never find it necessary to drop this or any other class. However, events can sometimes occur that make dropping a course necessary or wise. Please consult with me before you decide to drop to be sure it is the best thing to do. Should dropping the course be the best course of action, you must initiate the process to drop the course by going to the Student Services Center and filling out a course drop form. Just stopping attendance and participation WILL NOT automatically result in your being dropped from the class. (             ) is the last day to drop a class with an automatic grade of “W” this term.

• Classroom/professional behavior: Texas A&M University-Corpus Christi, as an academic community, requires that each individual respect the needs of others to study and learn in a peaceful atmosphere. Under Article III of the Student Code of Conduct, classroom behavior that interferes with either (a) the instructor’s ability to conduct the class or (b) the ability of other students to profit from the instructional program may be considered a breach of the peace and is subject to disciplinary sanction outlined in article VII of the Student Code of Conduct. Students engaging in unacceptable behavior may be instructed to leave the classroom. This prohibition applies to all instructional forums, including classrooms, electronic classrooms, labs, discussion groups, field trips, etc.. Also, Texas A&M University-Corpus Christi has a diverse student population that represents the population of the state. Our goal is to provide you with a high quality educational experience that is free from repression. You are responsible for following the rules of the University, city, state and federal government. We expect that you will behave in a manner that is dignified, respectful and courteous to all people, regardless of sex, ethnic/racial origin, religious background, sexual orientation or disability. Behaviors that infringe on the rights of another individual will not be tolerated.

• Grade Appeals (College of Science and Engineering Version): As stated in University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures, a student who believes that he or she has not been held to appropriate academic standards as outlined in the class syllabus, equitable evaluation procedures, or appropriate grading, may appeal the final grade given in the course. The burden of proof is upon the student to demonstrate the appropriateness of the appeal. A student with a complaint about a grade is
encouraged to first discuss the matter with the instructor. For complete details, including the responsibilities of the parties involved in the process and the number of days allowed for completing the steps in the process, see University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website at http://www.tamucc.edu/provost/university_rules/index.html, and the College of Science and Engineering Grade Appeals webpage (http://sci.tamucc.edu/students/GradeAppeal.html). For assistance and/or guidance in the grade appeal process, students may contact the chair or director of the appropriate department or school, the Office of the College of Science and Engineering Dean, or the Office of the Provost.

**Disabilities Accommodations:** The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation, please call or visit Disability Services at (361) 825-5816 in Corpus Christi Hall 116.

**Notice to Veterans:** If you are a returning veteran and are experiencing cognitive and/or physical access issues in the classroom or on campus, please contact the Disability Services office for assistance at (361) 825-5816.

**Statement of Academic Continuity:** In the event of an unforeseen adverse event, such as a major hurricane and classes could not be held on the campus of Texas A&M University–Corpus Christi; this course would continue through the use of Blackboard and/or email. In addition, the syllabus and class activities may be modified to allow continuation of the course. Ideally, University facilities (i.e., emails, web sites, and Blackboard) will be operational within two days of the closing of the physical campus. However, students need to make certain that the course instructor has a primary and a secondary means of contacting each student.

**Changes.** The instructor may amend the syllabus at any time prior to the final exam by announcing the changes in class.