I. COURSE INFORMATION

Instructor: Joe Champion, Ph.D.
E-mail: joe.champion@tamucc.edu
Webpage: http://faculty.tamucc.edu/jchampion
Office location: Center for Instruction #359
Office phone: 361-825-3165
Office hours: Tue/Thu 12-2 p.m., & by appt
Meeting place: CS 112
Meeting times: Tues/Thur, 2-3:50 p.m. June 4 - July 23, 2013

II. COURSE DESCRIPTION

This 4-credit course focuses on single-variable differential calculus. Emphasis is on technical skills, conceptual underpinnings, and applications of differentiation.

Math 2414 (Catalog Description): Limits, continuity, derivatives, applications of the derivative, and an introduction to integrals through differential equations. Counts as the mathematics component of the University Core Curriculum. Contains a laboratory component.

III. PREREQUISITES for the COURSE

MATH 1314 and 1316, or MATH 2312, or placement beyond MATH 2312.

IV. TEXTS and OTHER SUPPLIES REQUIRED

- WebAssign access (with new textbook or purchased separately). Link.
  - Class Key: tamucc TBD (includes e-book access)
- Occasional printing of lab activities and homework tasks (< $10 total)
- Regular access to high speed internet and office applications
- Graphing calculator (e.g., TI-84, TI-89, TI-Nspire, TI-Nspire CAS)

V. STUDENT LEARNING OUTCOMES

By the end of this core curriculum class, the student should:

1. Understand the scientific method and your place in the scientific community.
2. Be able to collaborate effectively as both an effective leader and follower.
3. Be able to apply mathematical concepts to new situations.
4. Communicate mathematics in interdisciplinary topics verbally and in writing.
5. Use mathematics to analyze data and translate data into visual representations.
6. Take personal responsibility and become a self-directed college learner.
7. Use technology effectively.

By the end of the course, the student should be able to:

1. Calculate limits and apply limit concepts to continuity, derivatives, and other contexts.
2. Calculate derivatives of functions from the definition, by applying rules to a standard catalog of functions, for implicitly defined functions, and for related rates.
3. Interpret derivatives as slopes of tangent lines and instantaneous rates of change. Relate units of a derivative to the units of the dependent and independent variable. Also, find and apply linearization and differentials of functions.

4. Apply derivatives to optimization of functions, determining geometric features of graphs of functions, and sketching graphs of functions.

5. Interpret and apply hypotheses of theorems and draw appropriate conclusions.

6. Use Riemann sums to approximate areas and estimate accumulations of rates; use antiderivatives and the Fundamental Theorem of Calculus to evaluate integrals.

VI. INSTRUCTIONAL METHODS and ACTIVITIES

The course will be a combination of interactive lecture, small-group activities, technology-assisted investigations, homework, and recommended work between students and the instructor outside of class. All participants are expected to actively engage in all class activities by contributing ideas and thoughtfully evaluating others’ contributions.

VII. MAJOR COURSE REQUIREMENTS and ASSESSMENTS

Final course grades will be a weighted average of mean scores using the following weights:

<table>
<thead>
<tr>
<th>Component</th>
<th>Weight</th>
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<tbody>
<tr>
<td>Quizzes &amp; Homework</td>
<td>20%</td>
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<tr>
<td>Exams</td>
<td>40%</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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Weighted overall scores ≥ 90% will earn a letter grade of A; ≥80% will earn at least a B; ≥ 70% will earn at least a C; ≥ 60% will earn at least a D; <60% will earn an F.

Quizzes, & Homework – practice the technical skills and foundational concepts in the class. Includes individual, collaborative or cooperative assignments, and web-based tasks.

Exams – demonstrate mastery of core skills through individual in-class unit tests. Your individual work will be graded for partial credit, but exams may not be retaken or made-up.

Labs – The lab portion of the course is led by a teaching assistant and has its own syllabus and policies that supplement this syllabus.

Final Exam – complete an individual comprehensive summative evaluation of course learning outcomes. The final exam cannot be made-up if missed. If you have a conflict with the scheduled time, contact me at least one week prior to discuss scheduling options.

» The university-scheduled final exam time is Tuesday, July 23, 2-3:50 p.m.

VIII. COURSE OUTLINE (subject to change, see the course site for updated schedule)

<table>
<thead>
<tr>
<th>Date</th>
<th>Content</th>
<th>Chapter</th>
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</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>T 6/4 Review of Algebra, Tangents, Velocity, Limits</td>
<td>1.3, 1.5, 1.6, 2.1, 2.2</td>
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<td></td>
<td>R 6/6 Limits at Infinity, Calculating Limits, Quiz</td>
<td>2.3, 2.6</td>
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<tr>
<td>Week 2</td>
<td>T 6/10 The Derivative, Basic Differentiation, Quiz</td>
<td>2.8, 3.1</td>
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<td></td>
<td>R 6/12 Review, Exam #1</td>
<td>(all above)</td>
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<tr>
<td>Week 3</td>
<td>T 6/18 Product &amp; Quotient Rules, Trig Derivatives</td>
<td>3.2, 3.3</td>
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<td>R 6/20 The Chain Rule, Quiz</td>
<td>3.4</td>
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<tr>
<td>Week 4</td>
<td>T 6/25 Implicit &amp; Logarithmic Differentiation</td>
<td>3.5, 3.6</td>
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<tr>
<td>Date</td>
<td>Content</td>
<td>Chapter</td>
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<tr>
<td>6/27 R</td>
<td>Mean Value Theorem, L'Hospital's Rule, Quiz</td>
<td>4.2, 4.4</td>
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<td>Week 5 T</td>
<td>Related Rates</td>
<td>3.9</td>
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<tr>
<td>7/2 T</td>
<td>[Catch-up]</td>
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<tr>
<td>7/9 T</td>
<td>Review, Exam #2</td>
<td>3.1-3.6, 3.9</td>
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<tr>
<td>7/11 R</td>
<td>Local and Global Extrema, Optimization</td>
<td>4.1, 4.7</td>
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<tr>
<td>7/16 T</td>
<td>Antiderivatives, Area and Accumulation, Quiz</td>
<td>4.9, 5.2</td>
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<tr>
<td>7/18 R</td>
<td>Comprehensive Final Exam</td>
<td>(all above)</td>
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**IX. CLASS POLICIES**

**Attendance & Participation.** This covers a large amount of content at a rapid pace. Success depends directly and indirectly on attending every class session, arriving on time, and completing all assignments. If you need to miss part or all of a class session, please talk with a classmate, visit the course site, read the planned section in the text, and email me.

**Online Homework.** Practice on WebAssign will be assigned by section and due according to deadlines posted in the system. We will rarely have time to discuss homework in class, so you're encouraged to work with peers and use office hours and the on-campus free tutoring in CASA for help. Any partial credit for late homework will follow the settings posted in WebAssign.

**Cell Phones/Electronic Devices.** Please silence electronic devices during class and step out of class to use them. You may not use any networked electronic device during exams.

**Written Work.** Demonstrating technical writing skills are a major goal of this class. Expect to type and proof-read all writing assignments. Submit only professional-quality work.

**In-Class Discussion.** Everyone in the class is encouraged to express personal views with an emphasis on evidence-based claims. We have diverse perspectives, but by maintaining a spirit of mutual respect, classroom discussion will be inviting, lively, and constructive.

**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 & participation WILL NOT automatically result in your being dropped from the class. **Friday, April 12** is the last day to drop a class with an automatic grade of "W" this term.

**Academic integrity.** 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 minimum of a 0 on the assignment or test.

**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, Room 116.

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.

Grade appeals process. As stated in University Rule 13.02.99.C2, Student Grade Appeals, 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 Rule 13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules website. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

Classroom 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.

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