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

Learning Objectives
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 or 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.
   b. Give an example of a function which does not satisfy the Mean Value Theorem.
   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 differentiable function at a point and use it to estimate the value of the function another point.
   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 real-life problems:
   a. Given an optimization problem find the mathematical model for it, and solve it using calculus techniques,
   b. Related rates 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.

**Major Course Requirements**
Successful completion of MATH 1314: College Algebra and MATH 1316: Trigonometry OR MATH 2312: Pre-Calculus OR placement beyond MATH 2312: Pre-Calculus.

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 and through email. Tutoring is also available on campus in CASA. The methods of evaluation and the criteria for grade assignments are: Online Homework and Quizzes 15%, Labs 25%, Derivative Mastery 10%, Exams 30% Final Exam 20%

**Online Homework and Quizzes:** Individual assignments are made online through WebAssign. Students will solve and submit completed homework assignments online through WebAssign. Homework will be assigned at the completion of each section and each homework assignment will have a due date. WebAssign will not allow students to submit homework assignments after the extension date has passed. WebAssign can be temporarily unavailable or behave erratically from time to time – no time extensions will be given for these problems. Therefore, it is in your best interest to finish the assignment well before the due date. Time extensions for homework will not be given for any circumstances, happenings, or individual student situations, period. Here is a PowerPoint link with step by step instructions for enrollment:
Quizzes will be administered online through WebAssign on specific days with limited time.
Labs: Labs will typically consist of a content mastery exam, recitation, and technology based lab. The reports will be graded on correctness, conclusions and presentation. The Lab TA will communicate your grades. The lab grade is 25% of the course grade. Labs can be found at TBD website. For more information, please refer to the lab syllabus provided by your TA.

Derivative Mastery: Students are expected to master the skill of computing derivatives of elementary functions. The student will demonstrate this on the Derivative Mastery Exam during the final lab period. Calculators or other materials will NOT be allowed on the exam. The exam will consist of 20 derivative problems graded as “all or nothing” and is worth 10% of the course grade.

Exams: There will be two equally weighted individual assessment exams given during the course of the semester. Calculators will be allowed unless otherwise instructed. A tentative schedule of exam dates can be found on the Tentative Course Outline.

Final Exam: The final exam will be an individual assessment covering ALL material presented in the course. Graphing calculators are allowed and encouraged for the final exam.

Tutoring: Seeking out help when learning math is very important especially when you are struggling with certain topics. TAMUCC offers various free tutoring opportunities to students.

Required or Recommended Readings

Required: Access code for online WebAssign (available in the bookstore or online) and a Texas Instruments TI-83 plus (or higher version) graphing calculator. To register for WebAssign, go to https://www.webassign.net and click “I Have a Class Key” underneath “LOG IN”. Our course code is TBD. Each student is allowed a free trial before purchasing access, but at some point, you will be required to purchase access.

Recommended: Physical copy of Calculus: Early Transcendentals by James Stewart 7ed. However, an electronic copy can be purchased online with your WebAssign account.

Course Policies

• Course grade will be based upon the percentage of the total possible points that a student earns and the following grading scale A: >90% of total points, B: >80% of total points, C: >70% of total points, D: >60% of total points.

• The class web page http://falcon.tamucc.edu/~mabudiab/Fall2012/math2413/index.htm will include information about tests and quizzes, documents, etc. You need to check frequently for updates.

• Attendance is mandatory. Attendance will be checked each class period.

• I am available during regular office hours or through special arrangement.

• Each student is expected to take notes during lectures, and keep a record of his/her assignments, tests and over all grades.

• Campus will be closed on September 3rd, 2012 for Labor Day Holiday and during Thanksgiving Holidays which is November 22-23, 2012.

• Last day of class is December 4th, 2012.

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 failing the course.

**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. **(November 2nd, 2012)** is the last day to drop a class with an automatic grade of “W” this term.

**Preferred methods of scholarly citations**
**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.

**Grade Appeals**
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 Rule13.02.99.C2, Student Grade Appeals, and University Procedure 13.02.99.C2.01, Student Grade Appeal Procedures. These documents are accessible through the University Rules Web site at http://www.tamucc.edu/provost/university_rules/index.html. For assistance and/or guidance in the grade appeal process, students may contact the Office of Student Affairs.

**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 Driftwood 101. 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.
Tentative Course Outline
A tentative course schedule may be found at

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