MATH 2413.002    Calculus I
Department of Mathematics and Statistics
Fall 2017

A. COURSE INFORMATION
Course number/section:   MATH 2413.002  
Class meeting time:   Lecture MWF 9:00 – 9:50 AM  
Class location:   Lecture IH158  
Course Website:   bb9.tamucc.edu  

B. INSTRUCTOR INFORMATION
Instructor:   Dr. Baohua Chen  
Office location:   CI 306  
Office hours:   WF 12:00-2:30 PM  
Telephone:   361-825-6019  
E-mail:   baohua.chen@tamucc.edu  
Appointments:   Appointments outside of office hours are available by request  

C. COURSE DESCRIPTION
Catalog Course Description
Limits, continuity, derivatives, applications of the derivative, and an introduction to integrals. Contains a laboratory component. Counts as the mathematics component of the University Core Curriculum.  

D. PREREQUISITES/COREQUISITES  
Prerequisites:   Math 1314 (College Algebra) and Math 1316 (Trigonometry), or Math 2312 (Pre-calculus), or placement beyond Math 2312.  
Corequisites:   Enrollment in lab MATH 2413-2XX.  

E. REQUIRED TEXTBOOK(S), READINGS, AND SUPPLIES
Required Textbook
Software
WebAssign access for homework assignment. Access code may be purchased through the WebAssign linked with the Blackboard. No class key is needed since Instructor has uploaded the roster to put students in the registered class.  

F. STUDENT LEARNING OUTCOMES AND ASSESSMENT
Assessment is a process used by instructors to help improve learning. Assessment is essential for effective learning because it provides feedback to both students and instructors. A critical step in this process is making clear the course’s student learning outcomes that describe what
students are expected to learn to be successful in the course. The students’ learning outcomes for this course are listed below. By collecting data and sharing it with students on how well they are accomplishing these learning outcomes students can more efficiently and effectively focus their learning efforts. This information can also help instructors identify challenging areas for students and adjust their teaching approach to facilitate learning.

By the end of this course, students should be able to:

1. Calculate and determine the existence of limits using the definition of limit, basic limits laws, and L’Hospital’s Rule. Use calculations of limits to determine local and end behavior of functions.

2. Calculate derivatives of functions from the definition, by applying appropriate rules, and by using implicit and logarithmic differentiation.

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.

4. Apply derivatives of functions appropriately to: create linearization and differentials of functions; determine and apply related rates of change to solve problems; solve optimization problems; and determine geometric features of graphs of functions.

5. Determine if functions meet hypotheses of theorems and draw appropriate conclusions. Give examples and counterexamples.

6. Use Riemann sums to approximate areas and to estimate accumulations of rates.

7. Use anti-derivatives, the Fundamental Theorem of Calculus, and appropriate u-du substitutions to evaluate integrals. Then interpret the results of integration as either a signed area under a curve, or as a function.

8. Recognize and determine the relationships between the graphs of a function, its derivatives and its integral.

G. INSTRUCTIONAL METHODS AND ACTIVITIES

Methods and activities for instruction include lecture by the instructor and participation by the students by doing problems in class.

- **Homework**: Homework will be assigned after each class through WebAssign. No homework in those weeks in which there is a test. Any homework questions will be answered during office hours if time does not permit in class.

- **Test**: There will be two in-class tests. They are tentatively scheduled for
  
  Test 1: Friday, Sep. 29th (Chapter 2);  
  Test 2: Monday, Nov. 13th (Chapter 4)

- **Midterm Exam**: Wednesday, Oct.25th (Chapters 2, 3)

- **Final Exam**: Friday, Dec. 8th (Chapters 2-5)

- **Lab**: One lab per week. You will practice lecture-related questions; work on computer-based labs (Matlab) to learn programming the mathematics taught during lecture.
H. MAJOR COURSE REQUIREMENTS AND GRADING

Grades will be calculated by homework, tests, exams and labs, according to the following percentages.

<table>
<thead>
<tr>
<th>ACTIVITY</th>
<th>% of FINAL GRADE</th>
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</thead>
<tbody>
<tr>
<td>Tests</td>
<td>20%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>20%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>30%</td>
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<tr>
<td>Homework</td>
<td>10%</td>
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<tr>
<td>Labs</td>
<td>20%</td>
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I. COURSE CONTENT/SCHEDULE

- Important dates:

  September 4  Labor day Holiday
  September 5  First Day of Classes
  November 22  Reading Day-No Class
  November 23-24 Thanksgiving Holidays
  November 27  Last Day to Drop a Class
  December 6   Last Day of Classes
  December 7   Reading Day
  December 8   Common Final Exam

  Academic Calendar: http://www.tamucc.edu/academics/calendar/index.html

- Course Schedule:

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<tr>
<th>Weeks</th>
<th>Sections</th>
<th>Topics</th>
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<tbody>
<tr>
<td>Sep. 4</td>
<td>Labor Day; Syllabus; PreCalculus review</td>
<td>Functions and their graphs Introduction of differential calculus</td>
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<tr>
<td>Sep. 11</td>
<td>2.1; 2.2; 2.3</td>
<td>Limits; Estimating limits from graphs; finding limits algebraically</td>
</tr>
<tr>
<td>Sep. 18</td>
<td>2.5; 2.6; 2.7</td>
<td>Continuity using limits; limits at infinity and asymptotes; Using secant line slopes to approximate tangent slope, Introduction to derivative</td>
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<tr>
<td>Sep. 25</td>
<td>2.8; Review; Test1</td>
<td>Visualizing graphs of functions and their derivative, derivative properties and intuition</td>
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<td>Oct. 2</td>
<td>3.1; 3.2; 3.3</td>
<td>Power Rule; Derivative of e^x and ln(x); Product and quotient rules; Derivatives of Trig. Functions: sin(x), cos(x), tan(x)</td>
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<td>Oct. 9</td>
<td>3.4; 3.5; 3.6</td>
<td>Chain Rule to evaluate derivative of composed function; Implicit differentiation; Derivative of inverse functions</td>
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<tr>
<td>Oct. 16</td>
<td>3.7; 3.9; 3.10</td>
<td>Applying differentiation in different fields; Related rates; Local Linearization</td>
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<tr>
<td>Oct. 23</td>
<td>Review; Midterm and 4.1</td>
<td>Critical Points, absolute and relative maxima and minima, and graphing with calculus</td>
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<td>Oct. 30</td>
<td>4.2; 4.3; 4.5</td>
<td>Mean value theorem; Concavity and inflection points; Sketch a curve based on information of function derivatives</td>
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<td>Date</td>
<td>Topic</td>
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<tr>
<td>Nov. 6</td>
<td>4.4; 4.7; Review L’Hospital’s Rule; Optimization problems</td>
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<tr>
<td>Nov. 13</td>
<td>Test 2, and 4.9 Indefinite Integral as Anti-derivative</td>
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<td>Nov. 20</td>
<td>5.1; 5.2; 5.3 Area under a rate function as net change, Riemann Sums, Fundamental theorem of calculus</td>
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<td>Nov. 27</td>
<td>5.4; 5.5; Review Substitution approach to calculate integral of composited function</td>
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<tr>
<td>Dec. 4</td>
<td>Review and Final Exam</td>
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Note: Changes in this course schedule may be necessary and will be announced to the class by the instructor. The assignments, quizzes and exams shown are directly related to the Student Learning Outcomes described in Section F.

J. COURSE POLICIES

- **Attendance/Tardiness**
  Attendance is mandatory. Attendance will be checked in each class. All absences will be considered “unexcused” unless you have an exceptional situation (e.g., documented illness, family situation), and you email the instructor about it within 24 hours. Excellent attendance records will help your grade in that borderline course-grade decisions will be influenced by these records.

- **Late Homework Assignments**
  Homework will be given each class period through WebAssign, and is due in the following week. In general, late homework will not be accepted, unless exceptional circumstances prevent you from completing them. Extension of deadlines will be at the instructor’s discretion. Late assignments may result in partial or total loss of credit. No homework grades will be dropped.

- **Make-up Exams**
  There is no makeup for any tests, midterm and final exam unless you could provide proper documentation from either medical doctors or any court orders. For an absence to be considered excused, the student must notify his or her instructor in writing (acknowledged e-mail message is acceptable) prior to the date of absence if such notification is feasible. In cases where advance notification is not feasible (e.g. accident or emergency) the student must provide notification by the end of the second working day after the absence. Without taking final exam, it will be an “F” for the semester grade regardless.
  Makeup test will be given once per student with appropriate documentation provided. Please save the opportunity for the emergencies.
  Final exam score will replace the student’s lower score in test (unless the final score is lower than two test scores)

- **Extra Credit:** There will be no extra credit for this course.

- **Laptop/Cell Phone Use**

  Cell phone using is prohibited in any circumstances.
Laptops, or any form of a new technology device is NOT allowed in the classroom during lecture and exam. Any use of cell phone or wireless device during a test carries the presumption of cheating. **A grade of ZERO will be awarded for that assignment for using, touching or clanking at a cell phone or wireless device.**

- **Food in Class**
  Please do not eat during class. This can distract others from learning, and part of my job is to provide a class atmosphere that aids student learning.

- **Missed Exam**
  See “Late Homework Assignments” and “Make-up Exams”

- **Participation**
  Strong, consistent class participation is expected from all students.

**K. COLLEGE AND UNIVERSITY POLICIES**

- **Academic Integrity (University)**
  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 failing grade.

- **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.

- **Statement of Civility**
  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.

- **Deadline for Dropping a Course with a Grade of W (University)**
  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 your academic advisor, the Financial Aid Office, and me, before you decide to drop this course.* 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. Please consult the Academic Calendar (http://www.tamucc.edu/academics/calendar/) for the last day to drop a course.

- **Grade Appeals (College of Science and Engineering)**
  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 at 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.

- **Disability Services**
  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 (361) 825-5816 or visit Disability Services in Corpus Christi Hall 116.

  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. http://disabilityservices.tamucc.edu/

- **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.
L. OTHER INFORMATION

- Academic Advising
  The College of Science & Engineering requires that students meet with an Academic Advisor as soon as they are ready to declare a major. The Academic Advisor will set up a degree plan, which must be signed by the student, a faculty mentor, and the department chair. Meetings are by appointment only; advisors do not take walk-ins. Please call or stop by the Advising Center to check availability and schedule an appointment. The College’s Academic Advising Center is located in Center for Instruction 350 or can be reached at (361) 825-3928.

GENERAL DISCLAIMER

I reserve the right to modify the information, schedule, assignments, deadlines, and course policies in this syllabus if and when necessary. I will announce such changes in a timely manner during regularly scheduled lecture periods.