

Calculus I – Math 2413

Departmental Syllabus for Fall 2008

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Office Hours: M,W 3:30 - 4:20; T, Th: 10:30 – 11:50 and other times by appointment

Course Information

Course Description: A study of functions, limits, continuity, differentiation of algebraic and trigonometric functions, applications of the derivative, definite and indefinite integrals with applications.

Credit hours: 4 hours

Course Prerequisites: You must satisfy *one* of the following

- Have a grade of C or better in a college trigonometry class (Math 1316 or equivalent).
- Have a grade of C or better in a Mathematics Department approved college level precalculus course (this is Math 2412 in Texas but is not offered at UTT).
- Pass a trigonometry placement test administered by the Department of Mathematics.
- Score of 675 or higher on the SAT (quantitative section).
- Score of 27 or higher on the ACT (math section).

Student Learning Outcomes: Upon completion of this course, students should be able to do the following:

- Discuss the solution to the tangent and area problems involving the calculus concepts of limits, derivatives, and integrals.
- Use graphs of functions to determine limits, continuity, and differentiability at a point.
- Determine whether a function is continuous and/or differentiable at a point using limits.
- Apply differentiation rules to differentiate common functions.
- Choose appropriate calculus concepts and techniques to provide mathematical models of real-world situations and determine solutions to applied problems.
- Compute definite integrals using the Fundamental Theorem of Calculus.
- Recognize and discuss the relationship between derivatives and integrals using the Fundamental Theorem of Calculus.

Course Evaluation

You will have a variety of assignments to assess your performance in this course.

Pre-test: A diagnostic pre-test will be given at the beginning of the semester to assess understanding of prerequisite material (algebra and trigonometry). The pre-test will be modeled from the placement tests for both College Algebra and Trigonometry. Unsatisfactory performance on this test will result in the mandatory lab usage (see policy below).

Homework: Each day you will be given a list of homework problems to complete by the next class meeting. The daily quiz will be taken from the homework (possibly with slight modifications).

Quizzes: Quizzes will be given at the beginning of each class, unless we have a test. At the end of the semester, I will drop some of your lowest quiz grades. **No quiz make-ups will be allowed.**

Tests: There will be four tests given this semester. All work must be shown on exams for credit. Calculators are not allowed during tests. Extra credit may be given on tests (see the Extra Credit section below). In addition, poor performance on an exam will result in mandatory lab sessions until the next test (see Mandatory Lab Usage below).

Final Exam: There will be a comprehensive final exam. No calculators will be allowed on the final exam. *A student's semester grade shall not exceed more than one letter grade above the letter grade on the final exam. That is, if you fail the final, then at most you can make a D in the course! If you make a C on the final, then at most you can make a B in the course!*

Attendance and Participation: If you attend class each day and make an effort to contribute during group work and other classroom activities, you will probably receive 100% of the points for attendance and participation (A&P). After 3 absences, you will receive 50% of the points for A&P. Any more absences will result in 0% for A&P. Certain instances of bad behavior will result in a student being considered absent for the day (examples: texting in class, leaving after the quiz, refusing to contribute during group work, etc.).

Grades: Your grade in this course will be computed according to the following percentages: 50% for tests, 15% for quizzes and homework, 5% attendance and participation, and 30% for the departmental final exam.

Instructor's Policies

Technology policy: *Mathematica* or graphing calculators may be useful for a small amount of homework. If you do not have a graphing calculator, then it is suggested that you use *Mathematica*. However, calculators are not allowed on any tests. UT Tyler has a site license for this software so it will cost nothing to use it in the computer labs. Neither the use of calculators nor *Mathematica* will be allowed on the tests.

Extra Credit: There will be a chance to earn back some points missed on exams. Time spent in the Mathematics Learning Center (MLC) will earn you these privileges. By spending 3 hours per week in the MLC each week after an exam, you will have the opportunity to take a make-up for extra credit. Each question on the make-up exam will be graded on an **all or nothing** basis. You can earn up to half of the missed points on an exam based on your performance. *These extra credit points will only be counted towards your grade if you also show promise on the next exam by earning a passing grade.*

There will be test corrections on tests 1-3 and the pre-test, but not on test 4 or the final. It is your responsibility to check both in and out of the MLC (by swiping your student ID) so that your time in the lab is properly recorded. If you do not sign-out then you will not receive credit for attending lab!

Mandatory Lab Usage: Students that score below a C on an exam (including the pre-test) will be required to go to the Mathematics Learning Center for three hours per week (no more than two hours in a given day) until the next exam is taken. Fulfilling this mandatory lab time in addition to passing the next

exam will make it possible to do test corrections (see extra credit opportunities above). **Violating mandatory lab time will result in lowering your next test grade by 10 points.**

Make-ups: If you know that you will be away from campus for a UT Tyler activity, then let your professor know at least one week in advance (preferably at the beginning of the semester). There will be no make-ups on quizzes; this is the reason everyone is allowed to drop some of their lowest quiz scores. Also, notify your professor within the first two weeks of classes if you are unable to meet at the scheduled final exam time due to class conflicts. A time will be scheduled for a make-up on the final exam. *Athletes and other students involved in extensive university activities should schedule a meeting in my office during the first two weeks of class to discuss this further.*

Course Content

Text: Essential Calculus Early Transcendentals by James Stewart

Accompanying Software: Enhanced WebAssign (optional)

(passwords come with a new book and can be bought separately if buying a used book)

Course Topics: The following is a detailed list of the sections that will be covered this semester from the textbook.

Chapter 1: Functions and Limits

Section 1.3: The Limit of a Function

Section 1.4: Calculating Limits

Section 1.5: Continuity

Section 1.6: Limits Involving Infinity

Chapter 2: Derivatives

Section 2.1: Derivatives and Rates of Change

Section 2.2: The Derivative as a Function

Section 2.3: Basic Differentiation Formulas

Section 2.4: The Product and Quotient Rules

Section 2.5: The Chain Rule

Section 2.6: Implicit Differentiation

Section 2.7: Related Rates

Section 2.8: Linear Approximation and Differentials

Chapter 3: Inverse Functions

Section 3.1: Exponential Functions

Section 3.2: Inverse Functions and Logarithms

Section 3.3: Derivatives of Logarithmic and Exponential Functions

Section 3.5: Inverse Trigonometric Functions

Section 3.6: Hyperbolic Functions

Chapter 4: Applications of Differentiation

Section 4.1: Maximum and Minimum Values

Section 4.2: The Mean Value Theorem

Section 4.3: Derivatives and the Shapes of Graphs

Section 4.5: Optimization Problems

Section 4.6: Newton's Method

Section 4.7: Antiderivatives

Chapter 5: Integrals

Section 5.1: Areas and Distances

Section 5.2: The Definite Integral

Section 5.3: Evaluating Definite Integrals
Section 5.4: The Fundamental Theorem of Calculus
Section 5.5: The Substitution Rule

Course Evaluation

Pre-test: A diagnostic “pre-test” will be given to all Calculus I students at the beginning of the semester to determine if they have the precalculus skills needed to have a successful semester in Calculus. The pre-test will be modeled from the placement tests for both College Algebra and Trigonometry. The results of this test will be used as a “self-check” of departmental prerequisites and as an assessment tool.

Homework: The following table contains a minimal list of suggested homework exercises. These exercises provide a good representation of what types of problems will be on the comprehensive departmental final exam.

Section 1.3: Problems 4, 8, 10, 12, 16
Section 1.4: Problems 4, 10, 20, 34, 44
Section 1.5: Problems 4, 14, 20, 32, 36
Section 1.6: Problems 4, 14, 20, 28, 38
Section 2.1: Problems 2ab, 6, 14, 28, 30
Section 2.2: Problems 2, 4, 20, 28, 34
Section 2.3: Problems 6, 8, 16, 36, 48
Section 2.4: Problems 4, 6, 20, 24, 42
Section 2.5: Problems 6, 8, 18, 38, 40
Section 2.6: Problems 6, 10, 14, 18, 28ab
Section 2.7: Problems 4, 9, 12, 22, 36
Section 3.1: Problems 24, 30
Section 3.2: Problems 2, 36, 62
Section 3.3: Problems 4, 12, 22, 29, 50
Section 3.5: Problems 4, 16, 18, 22, 32
Section 3.6: Problems 4, 8, 26, 34, 35
Section 4.1: Problems 2, 8, 34, 40, 46
Section 4.2: Problems 2, 6, 12, 16, 34
Section 4.3: Problems 2, 12, 26, 30, 36
Section 4.5: Problems 2, 6, 8, 24, 34
Section 4.6: See Newton’s Method handout.
Section 4.7: Problems 2, 8, 9, 10, 15, 21, 24, 26, 36, 37, 44, 46
Section 5.1: Problems 2, 4, 5, 8, 16
Section 5.2: Problems 4a, 10a, 16, 20, 32
Section 5.3: Problems 6, 14, 20, 22, 30, 58
Section 5.4: Problems 8, 12, 18, 22, 26
Section 5.5: Problems 10, 11, 21, 22, 24, 27, 30, 32, 36, 38

Departmental Final Exam: There will be a departmental written comprehensive final exam for all sections of Calculus I. The common time that has been scheduled for this exam is Monday, December 15 from 5:30 to 7:30 in ADM 127. If a student has a conflict with a regularly scheduled class, then arrangements will be made for a make-up. Also, if this final exam time causes a student to have three or more final exams in one day, then a make-up exam will be given. No make-ups will be given to accommodate travel or work schedules. All make-ups will be taken after the regularly scheduled time for the final. No calculators will be allowed on the final exam. The grading of the final exams will be a joint

effort amongst Calculus I instructors to ensure consistent grading. All final exams will be given to the coordinator for mandatory one-year storage.

Semester Grades: The departmental final exam will count for 30% of the semester grade. The course coordinator will provide a grade scale for the final exam. The final exam is not to be curved in calculating the students' grades.

Course Timeline

Important Dates:

September 1 – Labor Day Holiday

September 10 – Census Date

October 31 – Last day to drop a course with a W

November 26-29 – Thanksgiving Holiday

December 15 – Departmental Comprehensive Final Exam

Tentative Schedule: The table below provides a tentative schedule for the semester

Week	Dates	Sections
1	Aug. 27 – Aug. 29 (no Monday)	1.3 & Pre-test
2	Sept. 3 – Sept. 5 (no Monday)	1.4, 1.5
3	Sept. 8 – Sept. 12	1.5, 1.6
4	Sept. 15 – Sept. 19	2.1, 2.2, 2.3
5	Sept. 22 – Sept. 26	2.4, 2.5
6	Sept. 29 – Oct. 3	2.6, 2.7
7	Oct. 6 – Oct. 10	2.7, 3.1, 3.2
8	Oct. 13 – Oct. 17	3.3, 3.5, 3.6
9	Oct. 20 – Oct. 24	4.1, 4.2
10	Oct. 27 – Oct. 31	4.2, 4.3
11	Nov. 3 – Nov. 7	4.5
12	Nov. 10 – Nov. 14	4.6, 4.7
13	Nov. 17 – Nov. 21	5.1, 5.2
14	Nov. 24 (no Wed. or Fri.)	5.4, 5.3
15	Dec. 1 – Dec. 5	2.8, 5.5
16	Dec. 8 – Dec. 12	Catch up & Review
17	Dec. 15	Final Exam

University Policies

ADA Compliance:

If you have a disability, including a learning disability, for which you request disability support services/accommodation(s), please contact Ida MacDonald in the Disability Support Services office so that the appropriate arrangements may be made. In accordance with federal law, a student requesting disability support services/accommodation(s) must provide documentation of his/her disability of his/her disability to the Disability Support Services counselor. For more information, call or visit the Student Services Center located in the University Center, Room 282. The telephone number is 566-7079 (TDD)

565-5579). Additional information may also be obtained at the following UT Tyler Web address:
<http://www.uttyler.edu/disabilityservices>.

Social Security Statement:

It is the policy of The University of Texas at Tyler to protect the confidential nature of social security numbers. The University has changed its computer programming so that all students have an identification number.

Note Regarding Student Absence Due to Religious Observance:

Students who anticipate being absent from class due to a religious observance are requested to inform the instructor by the second class meeting of such absences.

Grade Replacement:

If you are repeating this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the census date. Failure to file an intent to use grade forgiveness will result in both the original and repeated grade being used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2008-2010 Catalog, p. 26)