

Oxford College of Emory University – Fall 2008

Math 110AX - Calculus I with PreCalculus

MTTh 2:00 to 2:50 & W 2:00 to 3:15 – Language 204B

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Office Hours: TBA

Text: James Stewart, *Essential Calculus: Early Transcendentals*.

Course Description: Math 110AX is the first part of a two-semester sequence that integrates precalculus into Calculus I with early transcendental functions. Either Math 110AX or its companion course Math 110A can be taken as a prerequisite to Math 110B, the terminal course in this sequence. Math 110AX meets more frequently than Math 110A, spending the extra time to strengthen students' mathematical backgrounds.

Content for Math 110AX (and Math 110A)

Review of algebra; functions; trigonometric, logarithmic, and exponential functions. Calculus topics include limits, continuity, definition of derivative, differentiation, extrema, Intermediate Value Theorem, Mean Value Theorem, graphing polynomial and rational functions, optimization problems.

Content for Math 110B

Review of inverse trigonometric functions and differentiation, and graphing. New topics include implicit differentiation, logarithmic differentiation, related rates, graphing vertical tangents, logarithmic and exponential graphs, sums and sigma notation, induction, antiderivatives, the Fundamental Theorem of Calculus, definite integral, area, volume, separable differentiable equations, substitution

Course Goals: Upon *successful* completion of Math 110AX and Math 110B, you will:

1. Understand conceptually limits and their relationship to the graph of a function.
2. Understand conceptually the derivative and its relationship to the graph of a function and to the concept of "rate of change".
3. Understand conceptually the definite integral and its relationship to area and volume.
4. Be able to calculate derivatives, evaluate limits, and compute integrals (both definite and indefinite).
5. Be well-prepared for Math 112.

Calculators: You will not be allowed to use calculators on any quizzes or exams.

Grading: Your grade is determined by your performance on homework, quizzes/projects, tests, and a *comprehensive* final exam. All tests will be administered on Thursday mornings throughout the semester.

Homework	50 points
Quizzes/Projects	150 points
5 Tests	500 points
<u>Final</u>	<u>200 points</u>
Total	900 points

Maximum grade cuts are as follows: 90% - A, 80% - B, 70% - C, 60% - D. Plus/minus grades may be assigned for percentages near the maximum grade cuts. **You must pass the final in order to pass the course.**

Homework: Completion of the daily homework assignments is critical to your success in this course and an excellent preparation for the quizzes. Some homework may be assigned and collected for a grade during the semester.

Quizzes/Projects: An undetermined number of quizzes will be given throughout the semester. Quizzes will usually not be announced ahead of time. The bottom 10% of your quiz grades will be dropped. The average of all of the remaining quizzes (and any projects assigned) will be used to determine how many of the 150 points for quizzes/projects you earn toward your overall grade. For example, if you had an average of 90% on your quizzes and projects, then you would receive 135 points toward your final grade. There is no provision for making up a quiz. You will receive a zero on any missed quiz. Grades on projects are treated identically to those on quizzes, except that project grades may not be dropped.

Tests: Five tests will be given on Thursday mornings and the dates for the exams are listed in the course calendar. You are expected to be present for all scheduled exams. Any conflicts should be brought to my attention as soon as possible. If you have a legitimate reason for missing an exam as determined by me, then you must take the exam prior to the regularly scheduled date. If taking the exam early is not possible, then you may be required to take a make-up exam that will be more difficult to offset the additional time given for study. You must provide written documentation in advance of any special accommodations required for testing. This includes additional time or other needs.

“Good Style”: All necessary work must be correctly shown in a clear and organized fashion for full credit. Organization and clarity of thought are essential to mathematical thinking. Therefore, points will be deducted for a lack of organization, illegible or sloppy work, and the inappropriate use of mathematical symbols, even if answers found are correct. You will be provided examples of what is considered “acceptably clear and organized work”. The goal is for you to solve problems in “good style”, unaided by books, notes, tutors, or calculators – and to understand the reasoning behind the solution method.

Class Attendance: You are responsible for all material covered in class and any changes to the syllabus that may be announced.

Religious Holiday Observance: Any conflicts between the course schedule and religious holy days are to be negotiated in advance with me.

Tutoring and Review Sessions: Paul Oser, the Math Center Director, is available for free, individual tutoring in the Math Center in Pierce Hall from 3-6 PM Mondays through Thursdays. Student tutors will also be available in the evenings and on Sundays. The schedule will be forthcoming. You are encouraged to do your homework in this area, where help is available as needed. Some of the student tutors, working in close conjunction with the coordinator for this course, will also hold review sessions in the evenings before the tests. These are to your benefit to attend.

The Math Center Online: You can will find tutorial videos, notes, and practice exercises – specifically created for Math 110AX at <http://mathcenter.oxford.emory.edu>. I encourage you to utilize this resource.

Learnlink: There is a class conference on Learnlink. Announcements from any instructor or tutor in the course will be posted there. You can ask questions and make requests of a general nature on this conference. Individual concerns should be sent directly to me.

Course Calendar (Subject to Change)

Date	Topic	Notes
Aug 27	Exponents & Order of Operations	
Aug 28	Diagnostic Exam	
Aug 29	Radical Expressions & Rational Exponents	
Sept 1	No Class	Labor Day
Sept 3	Polynomial Arithmetic & Factoring	Drop/Add Ends
Sept 4	Solving Linear Equations & Quadratics by Factoring	
Sept 5	Completing the Square, Quadratic Formula, Quadratic Forms	
Sept 8	Solving Polynomials by Factoring & Equations with Radicals	
Sept 10	Functions: Evaluation, Interval Notation, Domain & Range	
Sept 11	Inverse Functions & Combining Functions, Composition	
Sept 12	Graphing Linear Functions & Absolute Value Functions	
Sept 15	Transformations of Functions	
Sept 17	Distance, Midpoints, Circles & Semi-Circles	
Sept 18	Parabolas (Horizontal & Vertical)	Test 1
Sept 19	Rational Functions, Limits, "Holes" & Cancelling Factors	
Sept 22	Properties of Limits	
Sept 24	Piecewise Functions & One-Sided Limits	
Sept 25	Infinite Limits & Vertical Asymptotes	
Sept 26	Products & Quotients of Rational Functions	
Sept 29	Sums & Differences of Rational Functions	
Oct 1	Limits Involving Radicals, Conjugates & Absolute Value	
Oct 2	Continuity & Continuous Functions	
Oct 3	Unit Circle & Trigonometric Function Definitions	
Oct 6	Triangle Trigonometry, Angles & Rotations	
Oct 8	Trigonometric Identities	
Oct 9	Solving Trigonometric Equations	
Oct 10	Graphing Trigonometric Functions	Test 2
Oct 13	No Class	Mid-semester Break
Oct 15	Graphing Trigonometric Functions	
Oct 16	Limits/Continuity of Trigonometric Functions, Squeeze Theorem	
Oct 17	Intermediate Value Theorem	Last Day to Receive W
Oct 20	Slope & Equations of Lines	
Oct 22	Definition of Derivative, Slope of Tangent Line, Intervals of Increase/Decrease	
Oct 23	Using Definition to find Derivatives	
Oct 24	Tangent & Normal Lines to Graph of a Function	
Oct 27	Exponential Functions & Their Graphs, Limits at Infinity	
Oct 29	Logarithms & Their Graphs	
Oct 30	Properties of Logarithms	Test 3
Oct 31	Solving Logarithmic Equations	
Nov 3	Solving Logarithmic Equations	
Nov 5	Differentiation of Exponential, Logarithmic, Sine and Cosine Functions	
Nov 6	Sum/Differences, Constant Multiple, Power Rule	
Nov 7	Product Rule	
Nov 10	Quotient Rule	
Nov 12	Chain Rule	
Nov 13	Combining Differentiation Rules	Test 4
Nov 14	Continuity/Differentiability of Functions	
Nov 17	Mean Value Theorem	
Nov 19	Extrema on an Interval	
Nov 20	Optimization	
Nov 21	Optimization	
Nov 24	Graphing Polynomials, Second Derivatives & Concavity	
Nov 26	No Class	Thanksgiving
Dec 1	Graphing Polynomials, Second Derivatives & Concavity	
Dec 3	Catch-up & Review	
Dec 4	Graphing Rational Functions	Test 2
Dec 5	Graphing Rational Functions	
Dec 8	Final Review	Last Day of Class