

**Mathematics 110A**  
**Fall, 2007**

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**Class Meeting Times:** 8:30, 9:35, 10:40, 11:45 on MWF

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

**Course Content:** Mathematics 110A is the first part of a two-semester course, Mathematics 110A/B, which provides students with an integrative approach to Calculus I that includes the necessary precalculus topics.

**Content of Mathematics 110A:** Review of algebra, functions, trigonometric functions, logarithms and exponents. Calculus topics include limits, continuity, derivative, differentiation, extrema, Intermediate Value Theorem, Mean Value Theorem, graphing polynomial and rational functions, optimization problems.

**Content of Mathematics 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, Fundamental Theorem of Calculus, definite integral, area, volume, separable differential equations, substitution method of integration.

**Course Goals:** After completion of the sequence Mathematics 110A/B, the student should be able to do the following: find the limit, derivative, antiderivative, and definite integral of a function; to understand the basic theoretical underpinnings of these processes; to understand the relationships between these processes and rates of change; to understand the relationships between these processes and the graph of a function; and to apply these processes in solving problems on rates, extrema, area, volume, and approximation. An overall goal is to provide the student with a solid foundation for Mathematics 112.

**Class Attendance:** The student is responsible for all work covered in class. Furthermore, you are expected to have done the reading for each class. In addition to the regular class meetings, there will be optional SI and help sessions. There will also be four tests scheduled on Thursday mornings.

**Homework:** Assignments from the textbook and handouts are for the benefit of the student and will be collected on every Friday in class. It is important for the success of the student that the assignments be completed as they are assigned. Collaboration is encouraged. However, each student should be sure that he or she can **solve problems unaided by notes, the textbook, or other people**. Use good style on homework. Daily practice develops valuable mental habits. In general the student will need to study at least six good hours per week exclusive of the time spent on quizzes and review for tests. The instructor **will not** grade homework but check the class overall understanding.

**Gateway Exam:** In order to pass this course the student must pass an examination on basic algebra and trigonometry. The goal for the student to master fundamental skills needed for the student to be successful at learning calculus. The student will be given **three** opportunities to pass the exam on the following dates: **October 11, October 26, and November 2.** A more detailed guide will be provided prior to the first exam.

**Problem Sets:** Two problem sets will be given to be completed outside of class. Students may be called upon to write their solutions on the board during class.

**Bonus Points (20):** A murky card will be collected at the end of most class periods. Its purpose is to facilitate timely communication between the student and instructor. On the murky card, each student will write down what is not clear in the lecture so that the instructors can address these items next class periods. The student may also write down things he/she finds helpful.

Roughly 37-40 murky cards will be collected, and 35 will be counted. A maximum of 20 points can be earned on the murky cards.

**Tests and the Final Exam:** Calculators **will not** be allowed on tests. Tests will be given on: **September 20, October 18, November 8, and November 29.** The student is expected to take tests at the scheduled times. Any conflicts or problems will be handled on an individual basis. For excuses deemed legitimate arrangements will be made to take a test **prior to** the testing time.

A comprehensive final exam will be given at the time scheduled by the Registrar. (You may wish to fill in the appropriate time for yourself.)

**Grading:** Evaluation will be based on the following written work:

Tests (4 @ 100 pts)	400 points
Gateway Exam	100 points
Problem Sets (2)	50 points
Homework	50 points
Final	200 points
<i>Total</i>	800 points

In general, letter grades will be determined as follows:

- A: 720 or more points
- B: 640-719 points
- C: 560-639 points
- D: 480 - 559 points
- F: Fewer than 480 points

Grades of A-, B+, B-, C+, C-, D+ may be assigned for sums of points near the above cut-off scores in total points.

**Written Style:** Thoughts are expressed by sentences: just so in mathematics. Pay attention to your textbook: it is written in sentences. **Your written work must be in complete sentences.** Note " $1 + 1 = 2$ " is a complete sentence (it has a subject " $1+1$ ", verb " $=$ " and predicate " $2$ "). Use mathematical symbols wherever appropriate; do not use a lot of words. Your work needs to be neat and orderly to be intelligible. It is a common practice to rewrite solutions once they are found. See Priestley, "Clean Writing in Mathematics," pp.~413--420 in *Calculus: A Historical Approach*, which is on reserve.

**SI/Help Sessions/Tutoring:** The SI program is a program of supplemental instruction. The supplemental instructor (SI) is a student who has taken the course before, has a good understanding of the material (but probably not as complete as the instructor), and knows how to succeed in the course. The SI leads organized study sessions. They are not tutoring sessions and are not for going over homework. The sessions will help to make the student's efforts more productive.

Help sessions will be scheduled as there is demand for them. Attendance is optional.

Student tutors will be available and a schedule will be announced.

**Blackboard:** The student is responsible for obtaining the handouts on Blackboard. Handouts include information and exercises to supplement the textbook.

**Calculators:** Calculators **will not** be allowed on tests.

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

**Honor Code:** The Honor Code of Oxford College applies to all work submitted for credit in this course. To receive credit for work submitted you must place your name on it. By placing your name on such work, you pledge that the work has been done in accordance with the given instructions and that you have witnessed no Honor Code violations in the conduct of the assignment.

## Course Calendar (Subject to Change)

<b>29-Aug</b>	Wednesday	Algebra Review (Handout on Blackboard)
<b>31-Aug</b>	Friday	Algebra Review
<b>3-Sep</b>	Monday	Labor Day Holiday
<b>5-Sep</b>	Wednesday	Algebraic Functions, Piecewise Functions
<b>7-Sep</b>	Friday	Functions
<b>10-Sep</b>	Monday	Functions
<b>12-Sep</b>	Wednesday	Limit
<b>14-Sep</b>	Friday	Limit
<b>17-Sep</b>	Monday	Continuity
<b>19-Sep</b>	Wednesday	Test 1 Review
<b>20-Sep</b>	Thursday	<b>Test 1</b>
<b>21-Sep</b>	Friday	Intermediate Value Theorem, Properties of Continuous Functions
<b>24-Sep</b>	Monday	Limit Involving Infinity
<b>26-Sep</b>	Wednesday	Limit Involving Infinity
<b>28-Sep</b>	Friday	Definition of Derivative
<b>1-Oct</b>	Monday	Angles and Definition of Trigonometry
<b>3-Oct</b>	Wednesday	Trigonometry
<b>5-Oct</b>	Friday	Trigonometric Identities
<b>8-Oct</b>	Monday	Mid-Semester Break
<b>10-Oct</b>	Wednesday	Graphs of Trigonometric Functions
<b>12-Oct</b>	Friday	Logarithmic and Exponential Functions
<b>15-Oct</b>	Monday	Logarithmic and Exponential Functions
<b>17-Oct</b>	Wednesday	Test 2 Review
<b>18-Oct</b>	Thursday	<b>Test 2</b>
<b>19-Oct</b>	Friday	Logarithmic and Exponential Functions
<b>22-Oct</b>	Monday	Differentiation Rules
<b>24-Oct</b>	Wednesday	Differentiation Rules
<b>26-Oct</b>	Friday	Derivative of Trig, Log and Exp Functions
<b>29-Oct</b>	Monday	Differentiation - Chain Rule
<b>31-Oct</b>	Wednesday	Differentiation - Chain Rule
<b>2-Nov</b>	Friday	Continuity and Differentiability
<b>5-Nov</b>	Monday	Maxima and Minima
<b>7-Nov</b>	Wednesday	Test 3 Review
<b>8-Nov</b>	Thursday	<b>Test 3</b>
<b>9-Nov</b>	Friday	Maxima and Minima
<b>12-Nov</b>	Monday	Mean Value Theorem
<b>14-Nov</b>	Wednesday	Optimization
<b>16-Nov</b>	Friday	Optimization
<b>19-Nov</b>	Monday	Graphing Polynomials
<b>21-Nov</b>	Wednesday	Thanksgiving Break
<b>23-Nov</b>	Friday	Thanksgiving Break
<b>26-Nov</b>	Monday	Graphing Polynomials
<b>28-Nov</b>	Wednesday	Test 4 Review
<b>29-Nov</b>	Thursday	<b>Test 4</b>
<b>3-Dec</b>	Monday	Graphing Rational Functions
<b>5-Dec</b>	Wednesday	Final Review
<b>7-Dec</b>	Friday	Final Review
<b>10-Dec</b>	Monday	Final Review
<b>12-Dec</b>	Wednesday	Reading Day