Mathematics 110A
Fall, 2002

Textbook: Larson, Hostetler and Edwards, <u>Calculus of a Single Variable</u>: Early Transcendental Functions, D.C. Heath and Company, 3rd edition

Instructor: Dr. Evelyn C. Bailey or Dr. Fang Chen

Course Content: A two-semester course, Mathematics 110A, B provides students with an integrative approach to calculus that includes the necessary precalculus topics. Course content includes limits; continuity; the derivative; differentiation of algebraic, trigonometric, and the natural logarithmic and exponential functions; applications of derivatives; anti-derivatives; the definite integral; integration by substitution; and applications of the definite integral. Algebraic and transcendental functions are included. Math 110A does not count for a GER mathematics course. Math 110B does count for a GER mathematics course.

Content for Math 110A
Review of algebra, functions, trigonometric functions, logarithms and exponents. 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, Fundamental Theorem of Calculus, definite integral, area, volume, separable differential equations, substitution method of integration.

Goals: By the completion of the sequence Math110A and 110B, the student should have a basic conceptual understanding of the following: (1) limits and their relationship to the graph of a function, (2) the derivative and its relationship to the graph of a function and to the concept of "rate of change," and (3) the definite integral and its relationship to area and volume. The student should be able to calculate derivatives and to evaluate limits and integrals (both definite and indefinite). The sequential course for Math 110B is Math 112, Calculus II.

Class Attendance: The student is responsible for the course material discussed in class, therefore the student is expected to attend all classes. An inordinate number of absences will be handled in accordance with the College's policies.

Homework: Homework assignments are for the student's benefit and will not be collected. It is important, however, that the student thoughtfully complete most of the problems assigned. The student will need to spend <u>at least 6 good hours</u> of study each week, not counting time spent taking quizzes, reviewing for tests, and preparing the graphing portfolio.

Calculators: Calculators will not be allowed on tests or quizzes.

Gateway Exams: In order to pass this course, the student must pass two Gateway Tests, one on algebra and one on transcendental functions. There will be four opportunities for the student to earn all 25 points for each test. A perfect paper earns 25 points. If the student misses only ONE problem, the student may choose to keep a score of 22 points and not retest. If the student misses TWO problems, the student may choose to keep 18 points and not retest. If the student misses more than two problems, the student fails the test. The Gateway Exam A and T are scheduled on the attached sheet.

> **Gateway Test A** (Algebra) has eight problems as follows: one law of exponents problem, one factoring problem, one operations with fractions, one complex fraction to simplify, two solving equations, and two graphs of functions to sketch and label. The problem is correct only if everything related to the problem is correct. The student must have at least six problems completely correct to pass.

> **Gateway Test T** (Transcendental Functions) has eight problems as follows: one trigonometric value, two trigonometric graphs to sketch and label, one trigonometric identity, one trigonometric equation to solve, two logarithmic/exponential equations to solve, one logarithmic or exponential function to sketch and label. The student must have at least six problems totally correct to pass.

Quizzes: All quizzes are unannounced and are given in class. Eight quizzes will be given and the student's best five will be used to help determine the student's grade. If a student is not in class when a quiz is given, the student cannot make up the quiz. [Each quiz will be graded on a basis of 10 points.]

Major Tests: Four tests will be given at 8:00 a.m. as follows: Test 1 on Thursday, September 19; Test 2 on Thursday, October 17; Test 3 on Thursday, November 7; Test 4 on Tuesday, November 26. Students are expected to take tests at the scheduled times. Conflicts, problems and emergencies will be handled on an individual basis. For reasons deemed legitimate by your professor, arrangements may be made for a student to take a test _prior to_ the testing time. Any student who needs special accommodations must provided documentation several days in advance of the needed accommodation so that appropriate arrangements may be made.

Grading: The student's final course grade will be determined as follows:

Gateway Exams A and T @ 25 pts	50 points
Major tests (4 @ 100 points)	400 points
Quizzes (5 out of 8, as noted above)	50 points
Final Exam (Comprehensive)	200 points
	700 points

In general, letter grades will be determined as follows:

A:	630 or more points
B:	560 – 629
C:	490 – 559
D:	420 – 489
F:	fewer than 420 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.

Scheduled Help Outside Class: Maria Allegra, Joan Ball, Amber Bandeali, and Maica Kozak are SI leaders for Math 110A this semester. They will schedule outside of class study sessions for students.

In addition, student tutors are available to help with homework problems. A schedule of tutoring hours will be provided early in the semester.

e-Reserves/WebSite: The student is responsible for obtaining the handouts on library e-Reserves. Handouts include information and exercises to supplement the textbook.

In addition, there is a Graphing Tutorial at the following web site:
http://www.oxford.emory.edu/OXFORD/RESTRICTED/UNIVERSITY/Classes/Chen/Calculus/Index.htm

Learnlink: There is a class conference on Learnlink, Math 110A. Announcements from your SI leaders and from your instructors will be posted. Students may ask questions and make requests of a general nature on this conference. Individual concerns should be sent directly to your professor.

Summary of Important Dates:

Date	Event
September 2	Labor Day
September 12	Gateway Test A at 8:30 a.m.
September 19	Test 1 at 8:00 a.m.
September 26	Gateway Test A at 8:30 a.m.
October 10	Gateway Test A at 8:30 a.m.
October 14, 15	Mid-Semester Break
October 17	Test 2 at 8:00 a.m.
October 24	Gateway Test A at 8:30 a.m.
October 31	Gateway Test T at 8:30 a.m.
November 7	Test 3 at 8:00 a.m.
November 14	Gateway Test T at 8:30 a.m.
November 21	Gateway Test T at 8:30 a.m.
November 26	Test 4 at 8:00 a.m.
November 27, 28, 29	Thanksgiving Break
December 5	Gateway Test T at 8:30 a.m.
December 9	Last Class Day
December 11	Reading Day, any make up Gateway Tests with permission

Written Style: Neatness is one way of showing courtesy toward your instructor and pride in your work. Thoughts in mathematics are expressed in sentences, such as "$1 + 1 = 2$". There is a subject "$1 + 1$", a verb "$=$", and a predicate "2". The student should strive to be neat and to use mathematical symbols appropriately.

THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT IN THIS COURSE. BY YOUR SIGNATURE ON SUCH WORK YOU PLEDGE THAT WORK WAS DONE IN ACCORDANCE WITH THE RULES STIPULATED ON THE WORK OR IN THIS SYLLABUS.

Math 110A
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Class Calendar

Wednesday, August 28   Algebra Review
Friday, August 30
Wednesday, September 4

       Handout A (on e-Reserves)

Monday, September 2   Labor Day

Friday, September 6   Review of Graphing
Monday, September 9   Algebraic Functions

       Handout B (on e-Reserves)
       p. 8: 5, 7, 9, 11, 17, 19, 37, 39, 41, 43, 63, 65, 69, 71
       p. 16: 9, 11, 23, 25, 27, 31, 33, 35, 37, 39, 43, 49, 51

Wednesday, September 11   Limits
Friday, September 13

       p. 73: 11-18 all
       p. 83: 5-31 odd, 41, 42, 43, 44; 51-63 odd

Thursday, September 12   Gateway Test A at 8:30 a.m. in Seney Hall
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Monday, September 16   Continuity

       p. 94: 1-6 all, 7-19 odd, 29, 30, 32-36 all, 37-53 odd, 95-98 all

Wednesday, September 18   Review

Thursday, September 19   Test 1 at 8:00 a.m. in Seney Hall

Friday, September 20   Intermediate Value Theorem

       p. 96: 91 – 94 all
       p. 106: 15-20, 37, 42, 61-71 odd

Monday, September 23   Definition of Derivative

p. 120: 5 – 23 odd, 43, 44

Wednesday, September 25   Continuity and Differentiability

p. 121: 71 – 85 all

Thursday, September 26   Gateway Test A at 8:30 a.m. in Seney Hall
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Friday, September 27   Trigonometric Functions
Monday, September 30
Wednesday, October 2
Friday, October 4

Notes on Transcendental Functions – sections A, B, C, D (on e-Reserves)

Monday, October 7   Rules on differentiability (general rules, sum,
Wednesday, October 9   product, quotient rules)
Friday, October 11

p. 132: 3-15, 19, 21; 39-49
p. 142: 1-13 odd, 17-39 odd, 69

Thursday, October 10   Gateway Test A at 8:30 a.m. in Seney Hall
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Monday, October 14 is Mid-semester Break

Wednesday, October 16   Review

Thursday, October 17   Test 2 at 8:00 a.m. in Seney Hall

Friday, October 18   Logarithm and
Monday, October 21   Exponential Functions

Notes on Transcendental Functions, sections F and G (on e-Reserves)

Wednesday, October 23   Chain Rule (see p. 155)
Friday, October 25   e-Reserve: Differentiation (previous handout)
                                                 Continuity and Differentiability

p. 132: 17, 23, 51, 61; p. 143: 15, 41-53 odd, 71
p. 156: 9-35 odd, 47-93 odd

Thursday, October 24   Gateway Test A at 8:30 a.m. – <u>Fourth Test of A</u>!

Monday, October 28   Higher Order Derivatives
                                            (Differentiation Part 2 – on e-Reserve)

    p. 144: 83 – 90 all
    p. 157: 101 – 106 all
    p. 203: 1-37 odd, 55, 57-62 all

Wednesday, October 30   Mean Value Theorem
                                            (Handout on e-reserve)

    p. 190: 1-10 all, 17 – 32 all, 41-62 odd, 67-91 odd
    p. 210: 1-6 all, 7 – 21 odd, 35 – 44 all

Thursday, October 31   Gateway Test T at 8:30 a.m. in Seney Hall—<u>First Test of T</u>

Friday, November 1   Optimization Problems
Monday, November 4   (Handout on e-Reserve)

    p. 256: 3, 5, 15, 17, 19, 23, 27, 29, 33, 41, 43

Wednesday, November 6   Review (Review for Test 3 Handout)

Thursday, November 7   Test 3 at 8:00 a.m. in Seney Hall

Friday, November 8   Graphing Polynomials
Monday, November 11   Graphing Handout (on e-Reserves)

Wednesday, November 13   Infinite limits and limits at Infinity

    p. 103: 9 – 31 odd, 39 – 53 odd, 59, 60
    p. 237: 1-6 all, 7, 9, 11, 13-29 odd

Thursday, November 14   Gateway Test T at 8:30 a.m. in Seney Hall
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Friday, November 15   Review of limits
                                            Handout (on e-Reserves)

Monday, November 18   Graphing Rational Functions
Wednesday, November 20   Graphing Handout (continued)

Thursday, November 21   Gateway Test T at 8:30 a.m. in Seney Hall
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Friday, November 22   Review differentiation
                                                       Handout   (on e-Reserves)

Monday, November 25   Review (Review for Test 4 Handout)

Tuesday, November 26   Test 4 at 8 a.m. in Seney Hall

Wednesday, November 27—Friday, November 29   Thanksgiving Break
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Monday, December 2   Review

        Continuity, Intermediate Value Theorem, Mean Value Theorem

Wednesday, December 4   Review

        Optimization Problems

Thursday, December 5   Gateway Test T at 8:30 a.m. – Fourth Test of T!

Friday, December 6   Review

        Differentiation and Limits

Monday, December 9   Review

        Graphing

Wednesday, December 11 is Reading Day

The Final Exam will be given according to the exam schedule.