Mathematics 110A
Fall, 2003

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, Dr. Fang Chen, Dr. John Iskra

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.

> ### <u>Content for Math 110A</u>
> 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.

> ### <u>Content for Math 110B</u>
> 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. In addition, after two absences (excused or unexcused), any unexcused absence will result in a deduction of 5 points from your grade total. Entering class late by ten or more minutes is considered an absence.

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 18; Test 2 on Thursday, October 16; Test 3 on Thursday, November 6; Test 4 on Tuesday, November 25.** 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 <u>prior to</u> 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: Michael Bowman, LaKwanza Colbert, Maria Fawzyare and Kathryn Tapper 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 e-Reserves through the library web page. Handouts include information and exercises to supplement the textbook.

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

Learnlink: There is a class conference on Learnlink, **Math 110A fall 2003**. 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

September 1	Labor Day
September 11	Gateway Test A at 8:30 a.m.
September 18	Test 1 at 8:00 a.m.
September 25	Gateway Test A at 8:30 a.m.
October 9	Gateway Test A at 8:30 a.m.
October 13, 14	Mid-Semester Break
October 16	Test 2 at 8:00 a.m.
October 23	Gateway Test A at 8:30 a.m.
October 30	Gateway Test T at 8:30 a.m.
November 6	Test 3 at 8:00 a.m.
November 13	Gateway Test T at 8:30 a.m.
November 20	Gateway Test T at 8:30 a.m.
November 25	Test 4 at 8:00 a.m.
November 26, 27, 28	Thanksgiving Break
December 4	Gateway Test T at 8:30 a.m.
December 8	Last Class Day
December 10	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 Class Calendar
Fall, 2003

Wednesday, August 27   Algebra Review
Friday, August 29
Wednesday, September 3

      e-Reserve: Handout A Algebra Review

Monday, September 1   Labor Day

Friday, September 5   Review of Graphing

Monday, September 8   Algebraic Functions, Piecewise Functions

      e-Reserve: Handout B Graphs of Functions
      Textbook: 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 10   Limits
Friday, September 12

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

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Thursday, September 11   Gateway Test A at 8:30 a.m. in Seney Hall
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Monday, September 15   Continuity

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

Wednesday, September 17   Review for Test 1
      e-Reserve: Review for Test 1

Thursday, September 18   Test 1 at 8:00 a.m. in Seney Hall

Friday, September 19   Intermediate Value Theorem
                                    Properties of Continuous Functions
      e-Reserve: Properties of Continuous Functions
                    Intermediate Value Theorem
      Textbook: p. 96: 91 – 94 all
                     p. 106: 15-20, 37, 42, 61-71 odd

Monday, September 22   Definition of Derivative
Wednesday, September 24   Tangent Lines and Normal Lines

      e-Reserve: Definition of Derivative
      Textbook: p. 120: 5 – 23 odd, 43, 44

Thursday, September 25   Gateway Test A at 8:30 a.m. in Seney Hall
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Friday, September 26   Trigonometric Functions
Monday, September 29
Wednesday, October 1
Friday, October 3

      e-Reserve: Trig Handout
                      Notes on Transcendental Functions – sections A, B, C, D

Monday, October 6   Rules on differentiability

      e-Reserve: Differentiation

Wednesday, October 8   Differentiation rules continued
Friday, October 10   Derivative of Trigonometric functions
      e-Reserve: Differentiation - Find $f'(x)$
      Textbook: p. 132: 3-15, 19, 21; 39-49
                      p. 142: 1-13 odd, 17-39 odd, 69

Thursday, October 9 Gateway Test A at 8:30 a.m. in Seney Hall
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Monday, October 13 is Mid-semester Break

Wednesday, October 15   Review for Test 2
      e-Reserve: Review for Test 2

Thursday, October 16   Test 2 at 8:00 a.m. in Seney Hall

Friday, October 17   Logarithm and
Monday, October 20   Exponential Functions

      e-Reserve: Notes on Transcendental Functions, sections F and G

Wednesday, October 22   Chain Rule
Friday, October 24   Continuity and Differentiability

       <u>e-Reserve:</u>   Differentiation
       <u>e-Reserve:</u>   Continuity and Differentiability
       <u>Textbook:</u>   p. 132: 17, 23, 51, 61;
                       p. 143: 15, 41-53 odd, 71
                       p. 156: 9-35 odd, 47-93 odd
                       p. 121: 71 – 85 all

Thursday, October 23   Gateway Test A at 8:30 a.m. – <u>Fourth Test of A</u>!

Monday, October 27   Higher Order Derivatives
       <u>e-Reserve:</u>   Differentiation- Find $f'(x)$ part 2
       <u>Textbook:</u>   p. 144: 83 – 90 all
                       p. 157: 101 – 106 all

Wednesday, October 29   Mean Value Theorem
       <u>e-Reserve:</u>   Mean Value Theorem
       <u>Textbook:</u>   p. 210: 1-6 all, 7 – 21 odd, 35 – 44 all
                       p. 190: 1-10 all, 17 – 32 all, 41-62 odd, 67-91 odd

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

Friday, October 31   Extrema and Optimization Problems
Monday, November 3

       <u>e-Reserve</u>:   Optimization Problems
                       Optimization – Examples for Class
       <u>Textbook:</u>   p. 203: 1-37 odd, 55, 57-62 all
                       p. 256: 3, 5, 15, 17, 19, 23, 27, 29, 33, 41, 43

Wednesday, November 5   Review for Test 3
       <u>e-Reserve:</u>   Review for Test 3

Thursday, November 6   Test 3 at 8:00 a.m. in Seney Hall

Friday, November 7   Graphing Polynomials
Monday, November 10

       <u>e-Reserve:</u>   Graphing Handout
                       Calculus Page – Graphing Tutorial (Polynomials)

Wednesday, November 12   Infinite limits and limits at Infinity

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

Thursday, November 13   Gateway Test T at 8:30 a.m. in Seney Hall

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Friday, November 14   Review of limits
       e-Reserve :   Limits Review

Monday, November 17   Graphing Rational Functions
Wednesday, November 19
       e-Reserve: Graphing Handout
                  Calculus Page – Graphing Tutorial (Rational Functions)

Thursday, November 20   Gateway Test T at 8:30 a.m. in Seney Hall

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Friday, November 21   Review differentiation

       e-Reserve: Review Differentiation

Monday, November 24   Review for Test 4
       e-Reserve: Review for Test 4

Tuesday, November 25   Test 4 at 8 a.m. in Seney Hall

Wednesday, November 26—Friday, November 28 Thanksgiving Break

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Monday, December 1   <u>Review for Final</u>
                  Continuity, Intermediate Value Theorem, Mean Value Theorem
       e-Reserve: Review for Final I

Wednesday, December 3   <u>Review for Final</u>
                     Optimization Problems
       e-Reserve: Review for Final II

Thursday, December 4   Gateway Test T at 8:30 a.m. – <u>Fourth Test of T</u>!

Friday, December 5   <u>Review for Final</u>
                     Differentiation and Limits
       e-Reserve: Review for Final III

Monday, December 8   <u>Review for Final</u>
                                                      Graphing

       <u>e-Reserve</u>:   Review for Final IV

Wednesday, December 10 is Reading Day

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