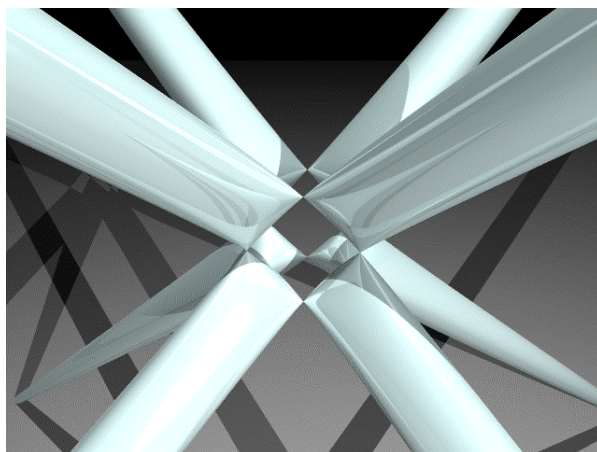


Mathematics 110A
Calculus I with Precalculus
Spring, 2004
Senior Lecturer: Mrs. Susan Riner
Office: 116C Seney Hall



Kummer's Surface

Gottfried Wilhelm Leibniz (1646-1716)

The imaginary number is a fine and wonderful recourse of the divine spirit, almost an amphibian between being and not being.

Hermann Weyl (1885 - 1955)

A modern mathematical proof is not very different from a modern machine, or a modern test setup: the simple fundamental principles are hidden and almost invisible under a mass of technical details.

Philip J. Davis

One of the endlessly alluring aspects of mathematics is that its thorniest paradoxes have a way of blooming into beautiful theories.

Jules Henri Poincaré (1854-1912)

Mathematics is the art of giving the same name to different things.

Havelock Ellis

It is here [in mathematics] that the artist has the fullest scope of his imagination.

Mathematics 110A
Calculus I with Precalculus
Spring, 2004

Instructor: Mrs. Susan Riner
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Textbook: Larson, Hostetler and Edwards, *Calculus of a Single Variable: Early Transcendental Functions*, Houghton Mifflin Co., 3rd Edition.

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.

Course Goals: By the completion of the sequence Math 110A 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

Gateway Tests: 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. These tests will be given outside the regular class time. The schedule of Gateway Exams is given on the attached Class Calendar.

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 B (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 completely correct to pass.

Tests: Four tests will be given outside the regular class time. Test dates are given on page 4, with other important dates.

Note: Test dates are subject to change if the instructor deems it necessary.

Test Attendance: Students are expected to take tests at the scheduled times. The instructor will handle any conflicts, problems, or emergencies on an individual basis. If a student has an excuse deemed legitimate by the instructor, arrangements will be made for the student to take a test prior to the testing time. Any student who needs special accommodations must provide documentation several days in advance of the needed accommodation in order for appropriate arrangements to be made.

Evaluation: The following written work will provide the basis of the student's evaluation:

Gateway Tests @ 25 pts.	50 points
Five SI attend. @ 10 pts.	50 points
Tests (4 @ 100 points)	400 points
<u>Final Exam</u>	<u>200 points</u>
Total	700 points

In general, letter grades will be determined as follows:

A:	630 or more points
B:	560-629 points
C:	490-559 points
D:	420 - 489 points
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.

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

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

Homework: Homework assignments are for the student's benefit and will not be collected. The most important factor contributing to success in Math 110A is the regular (done at least every other day) and successful (exercises correctly done with a degree of confidence) completion of the exercises. Daily practice is recommended with a minimum of 6-8 hours of study each week. The goal is that the student be able to solve problems in good style, unaided by books, notes, tutors, or calculator.

Written Work: Express your thoughts in complete sentences; e.g. $2+3 = 5$, where $2+3$ is the subject, " $=$ " is the verb, and " 5 " is the predicate. Use mathematical symbols wherever appropriate and make your work neat and legible. Pay attention to the way problems are solved in class and in the textbook and duplicate those methods. You will more clearly understand the concepts if your work is done logically, step by step.

Tutoring/Help Sessions: Maria Fawzy, LaKwanza Colbert, and Kathryn Tapper are the Student Instructors for Math 110A this semester. They will schedule study sessions for students. Also, student tutors will be available in the evenings in the Gregory Room of the JRC; a schedule will be provided early in the semester.

SI Attendance: Attendance at supplemental instruction is not required. However, in lieu of quizzes, each student should attend five sessions, beginning with the calculus topic "Limits". The student will take notes at the session and show those notes to his/her instructor for a grade of 10 points. The SI leaders keep attendance records; it is the student's responsibility to make sure his attendance is noted.

Learnlink: There is a class conference on Learnlink, Math110A, Spring2004. Announcements from your SI leaders and from your instructor 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.

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

Class Attendance: The student is responsible for the course material discussed in class and for any announced changes to this syllabus. Therefore, the student is expected to attend all classes. Attendance will be taken. After 3 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.

Some Important Dates:

Jan. 19	Martin Luther King, Jr. holiday
Jan. 21	Last Drop/Add Day
Feb. 18	Last Day to Drop with W
March 8-12	Spring Break
Apr. 27	Last Class Day
Apr. 29, 30 & May 3-5	Final Exams

Tentative Test Dates:

Tues., Feb. 10, 8:00 - 9:45 a.m.	Test 1
Thurs., Feb. 26, 8:00 - 9:45 a.m.	Test 2
Fri., Mar. 26, 2:15 - 4:00 p.m.	Test 3
Fri., Apr. 16, 2:15 - 4:00 p.m.	Test 4

Gateway Test Dates:**Test A****Test T**

Thurs., Jan 29, 8:30 a.m.
Fri., Feb. 13, 2:00 p.m.
Tues., Mar. 2, 8:30 a.m.
Fri., Mar. 19, 2:00 p.m.

Tues., Mar. 30, 8:30 a.m.
Tues., Apr. 6, 8:30 a.m.
Tues., Apr. 13, 8:30 a.m.
Thurs., Apr. 22, 8:30 a.m.

THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT IN THIS COURSE. WHEN YOU WRITE YOUR NAME ON SUCH WORK, YOU ARE PLEDGING THAT THE WORK WAS DONE IN ACCORDANCE WITH THE RULES STIPULATED ON THE WORK OR IN THIS SYLLABUS.

Math 110A
Spring, 2004

Course Calendar for Test 1 & Test 2

Wed. Jan. 14 Algebra Review
Fri. Jan. 16
Wed. Jan. 21

e-Reserve: Handout A Algebra Review

Fri. Jan. 23 Review of Graphing

e-Reserve: Handout B Graphs of Functions
Calculus Page: Piecewise Functions

Textbook: p. 8: # 5, 7, 9, 11, 17, 19, 37, 39, 41, 43, 63, 65, 69, 71
p. 16-17: # 9, 11, 23, 25, 27, 31, 33, 35, 37, 39, 43, 49, 51

Mon. Jan. 26 Algebraic Functions, Piecewise Functions

Wed. Jan. 28 Limits

e-Reserve: Limits

Textbook: p. 73: #11-18 all
p. 83-84: #5-31 odd, 33-39 odd, 41, 42, 43, 44, 51-63 odd

▪ **Thurs. Jan. 29 8:30 a.m. Gateway A – 1**

Fri. Jan. 30 Limits (cont.)

Mon. Feb. 2 Continuity

e-Reserve: Continuity & Review for Test 1

Textbook: p. 94-96: #1-6 all, 7-19 odd, 29, 30, 32-36 all, 37-53 odd, 95-98 all

Wed. Feb. 4 Continuity (cont.)

▪ **Test 1 Material Ends**

Fri. Feb. 6 Intermediate Value Theorem
Properties of Continuous Functions

e-Reserve: Intermediate Value Theorem Handout
Properties of Continuous Functions

Textbook: p. 96: 91-94 all
p. 106: (Ch. Review) #15-20 all, 37, 39, 41, 42, 61, 63, 67-71 odd

Mon. Feb. 9 Review for Test 1

▪ **Tuesday Feb. 10 8:00 a.m. Test 1**

Wed., Feb. 11 Definition of Derivative

e-Reserve: Def. of a Derivative Handout

Textbook: p. 120: # 5, 7, 9, 11, 15, 17, 21, 23, 43, 44

▪ **Friday Feb. 13 2:15 am Gateway Test A-2**

Fri. Feb. 13 Tangent Lines and Normal Lines
Mon. Feb. 16 Trigonometric Functions

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

Wed. Feb. 18 Trigonometry (cont.)
Fri. Feb. 20 Trigonometry (cont.)
Mon. Feb. 23 Trigonometry (cont.)

Wed. Feb.25 Review for Test 2

Thurs. Feb. 26 8:00 am Test 2