

# Mathematics 111

Fall, 2000

**Textbook:** Larson, Hostetler and Edwards, Calculus of a Single Variable: Early Transcendental Functions, D. C. Heath and Company, 2<sup>nd</sup> edition

**Instructors:** Dr. Robert E. Bailey and Dr. Fang Chen  
Office: Seney 115  
Phone: 4-8398 (Bailey) and 4-4639 (Chen)

**Office Hours:** Check with your instructor.

**Course Content:** Math 111 is the first semester of introductory calculus. Course content includes limits; continuity; the derivative; differentiation of algebraic, trigonometric, and the natural logarithmic and exponential functions; applications of derivatives; antiderivatives; the definite integral; simple integration by substitution; and applications of the definite integral. A list of specific topics by day is given below.

**Goals:** By the completion of this course, the student should have a basic 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;" (3) the definite integral and its relationship to summation, area and volume; (4) antiderivatives and their relationship to derivatives and to the definite integral. The student should be able to find derivatives and antiderivatives and to evaluate limits and definite integrals of a large number of functions widely used in applications.

**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. Note especially that you should make every effort to attend class on days that quizzes are given out (please see "Quizzes" below).

**Homework:** Homework assignments are for the student's benefit and will not be collected. It is important, however, that the student complete thoughtfully most of the problems assigned. The student will need to spend at least 6 good hours of study each week, not counting time spent taking quizzes, reviewing for tests, and preparing the graphing portfolio. The student is urged to study the examples worked out in the textbook, especially those which your instructor identifies as important.

**Calculators:** Calculators will not be needed on tests or quizzes unless specified.

**Quizzes:** All quizzes are announced (Please see "Course Calendar" below.) and "take home." A student must be present in class to receive a quiz. Students must complete quizzes during one sitting and use only authorized materials (pencil, paper, calculator as specified above, and any reference material specifically authorized for a given quiz). Quizzes are due at class time on the class day following their assignment. If you are not in class when a quiz is given out, you generally cannot receive a copy of the quiz; however, exceptions to this policy are sometimes permitted on an emergency basis.

EMORY UNIVERSITY



050000003653

Each quiz will be graded on a basis of 25 points. Twelve quizzes will be used in the determination of the student's grade, as follows: the best three scores on Quizzes 1-13, the scores on Quizzes 14 and 15 cannot be dropped.

**Major Tests:** Three tests will be given as follows:

Test 1: Thursday, September 28 at 7:45 a.m.

Test 2: Tuesday, October 24 at 7:45 a.m.

Test 3: Tuesday, November 21 at 7:45 a.m.

Students are expected to take tests at the scheduled times in Seney Hall (Seney 322 for Bailey; S209 for Chen). 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 at test prior to the testing time.

**Graphing Portfolio:** You are to use software (GRAPHMATICA) available in the computer labs to prepare a portfolio of computer-generated graphs. The portfolio is to contain at least 15 distinctly different graphs. The function involved in each graph is to be clearly identified by formula. Use only algebraic, trigonometric (including inverse trigonometric), logarithmic and exponential functions or combinations of them. You must clearly label all important features of the graphs.

Student workers in the computer lab may help with the use of the computer and software, but you must choose your own functions and create your own printouts and portfolio. Evaluation of your portfolio will be made on the your selection of graphs, the documentation associated with the graphs and your overall presentation of the portfolio. Accuracy, clarity, organization and originality are important in your finished product. This assignment is due on Friday, November 10 at class time

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

Major tests (3 @ 100 points)	300 points
Quizzes (12 out of 15, as noted above)	300 points
Graphing Portfolio	175 points
Final Exam	<u>225 points</u>
	1000 points

In general, letter grades will be determined as follows:

- A: 900 or more points
- B: 800-899 points
- C: 700-799 points
- D: 600-699 points
- F: fewer than 600 points

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

**Scheduled Help Outside Class:** Alex Ashong, Elizabeth Nguyen, and Lindsey Thompson are SI leaders for Math 111 this semester. They will schedule sessions outside of class for your benefit. Watch for announcements on the class conference.

Student tutors are available to help with homework problems. A schedule will be provided early in the semester. Use these additional opportunities for help only at appointed times.

**Summary of Important Dates:**

September 4	Labor Day
September 28	Test 1
October 16, 17	Midsemester Break
October 24	Test 2
November 10	Graphing Portfolio Due
November 21	Test 3
November 22-26	Thanksgiving Break
December 11	Last Class Day
December 13	Reading Day

**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.**

# Mathematics 111

Fall, 2000

## Class Calendar with Homework Assignments from the Textbook and Quiz Dates

Wednesday, August 30

**Review of Functions [Chapter P]**

p. 9: 1-4, 9, 23, 25, 29

p. 17: 21, 29, 35

p. 28: 3, 5, 11, 13, 15

p. 34: 1-4

p. 44: 1, 5, 7, 9-12, 13, 19, 85, 87, 89, 103, 105

p. 53: 1-15 (odd); 19-27 (odd), 35, 3, 7, 45-53 (odd), 73, 75

Friday, September 1

**Review of Functions; Introduction to  
Calculus [1.1]; Limits [1.2]**

p. 70: 13-21 (odd); finish previous

Labor Day Holiday - Monday, September 4

Wednesday, September 6

**Limits [1.3]**

p. 80: 1, 3, 11-37 (odd), 43, 45

Friday, September 8

**Continuity [1.4]**

p. 92: 1, 5-10 (all), 11-27 (odd), 31-55 (odd), 61, 63

**Quiz 1**

Monday, September 11

**Intermediate Value Theorem [1.5];  
Review**

p. 94: 89-92 (all)

p. 104: 7-27 (odd), 49, 51, 59

Wednesday, September 13

**Definition of Derivative, Tangent Line  
Problem, Differentiability [2.1]**

p. 116: 1, 5-15 (odd), 27-33 (odd), 53-67 (odd)

**Quiz 2**

Friday, September 15

**Basic Rules of Differentiation (the constant-multiple, sum, and difference rules; derivatives of powers, sine, cosine, and exponential functions)**

p. 129: 1-49 (odd); 57-63 (odd), 85, 87

Monday, September 18

**Product and Quotient Rules, Higher Order Derivatives [2.3]**

p. 140: 1-45 (odd), 63, 65, 67, 83-93 (odd)

**Quiz 3**

Wednesday, September 20

**Chain Rule, Derivative of the Natural Logarithm Function [2.4]**

p. 153: 9-31 (odd), 45-89 (odd), 125, 127, 129

Friday, September 22

**Review of Differentiation**

p. 188: 1, 2, 5-45 (odd), 77, 79, 81, 127

**Quiz 4**

Monday, September 25

**Review**

Wednesday, September 27

**Review**

Thursday, September 28

***Test 1 at 7:45 a.m.***

Friday, September 29

**Implicit Differentiation [2.5]  
Derivatives of Arcsine and Arctangent functions [2.6]**

p. 163: 1-30 (odd); 33-36 (all); 41, 43, 45, 51-61 (odd)

p. 171: 11, 15, 17, 25, 27

Monday, October 2

**Related Rates [2.7]**

p. 178: 15, 19, 20, 21, 23, 27, 30, 35, 43, 45

**Quiz 5**

Wednesday, October 4

**Extrema on an Interval [3.1]  
Mean Value Theorem [3.2]**

p. 200: 1-9 (odd), 15-25 (odd), 33-36 (all)  
p. 207: 3-15 (odd)

Friday, October 6

**Review**

**Quiz 6**

Monday, October 9

**Graphing Concepts [3.3, 3.4] with Application  
to Polynomial Functions**

p. 216: 1, 3, 5, 51, 53  
p. 224: 1, 3, 5, 59, 61  
Graphing handout

Wednesday, October 11

**Infinite Limits [1.6]  
Limits at Infinity [3.5]**

p. 101: 1, 3, 9-29 (odd)  
p. 223: 1-6 (all); 7-24 (odd)  
**Quiz 7**

Friday, October 13

**Graphing Rational Functions [3.6]**

Graphing handout

Saturday - Tuesday, October 14-17 **Midsemester Break**

Wednesday, October 18

**Graphs with Vertical Tangents, Other Types  
of Graphs [3.6]**

Graphing handout  
**Quiz 8**

Friday, October 20

**Review**

p. 271: 7, 9, 13, 15, 37, 41-55 (odd)

Monday, October 23

**Review**

Tuesday, October 24

***Test 2 at 7:45 a.m.***

Wednesday, October 25

**Optimization [3.7]**

p. 252: 3,5,7,9,15,16,19,21,31,35  
p. 273: 81,83

Friday, October 27

**Quiz 9**

Monday, October 30

p. 284: 1-4(odd), 59-75(odd)

Wednesday, November 1

p. 296: 7,9,11,13,41-47(odd)

Friday, November 3

Monday, November 6

p. 307: 1-15 (odd), 19-29 (odd)

**Quiz 10**

Wednesday, November 8

p. 332: 7-25 (odd), 31-55 (odd)

Friday, November 10

**Quiz 11**

Monday, November 13

p. 348: 1-29 (odd)

p. 355: 1-31 (odd)

Wednesday, November 15

p. 378: 1,3,5

p. 390: 33-41 (odd), 45-63 (odd)

**Quiz 12**

Friday, November 17

p. 367: 3,5,7,13,21-33 (odd), 39,41,45,47,49,51

**Quiz 13**

Monday, November 20

**Optimization continued....**

**Antiderivatives [4.1]**

**Sums and Sigma Notation [4.2]**

**Induction (handout)**

**Definite Integral, Area [4.3]**

**Fundamental Theorem of Calculus [4.4]**

**Integration by Substitution [4.5]**

**Graphing Portfolio Due  
Review**

**More Substitution [4.7, 4.8]**

**Introduction to Differential Equations  
Separation of Variables [5.1, 5.2]**

**Review**

**Review**

Wednesday, November 21

**Test 3 at 7:45 a.m.**

Thanksgiving Break - November 22-26

Monday, November 27

**Area Between Curves [6.1]**

p. 413: 1-9 (odd), 13-25 (odd)

Wednesday, November 29

**Volumes of Revolution - Disk Method [6.2]**

p. 423: 1-29 (odd)

Friday, December 1

**Volumes of Revolution - Shell Method [6.2]**

p. 432: 1-9 (odd), 13-23 (odd)

Monday, December 4

**Review of Area and Volume**

p. 471: 1-9 (odd), 21, 23, 27, 29

Wednesday, December 6

**Course Review**

**Quiz 14 and 15**

Friday, December 8

**Course Review**

Monday, December 11

**Course Review**

**Final Examinations will be given in your regular classroom at the scheduled time. (See final exam schedule.)**