Mathematics 112/112S
Fall, 2000

Textbook: Larson, Hostetler, Edwards, Calculus, 2nd edition

Instructor: Dr. Evelyn C. Bailey, Office in Seney 303

Office Hours: MWF: 10-12 and 1:15 - 3:30; TTh: 2:00 - 3:30; others by appointment; email: ebailey@emory.edu

Learn Link: There is a conference, Math 112, for all students enrolled in Math 112/112S. Announcements, scheduled SI sessions, questions related to problems, information can be posted at any time.

Content: Mathematics 112 is the second semester of calculus and is designed specifically for students who have completed a semester of college calculus (Math 111, Math 111Z, or AP Calculus). Course content includes methods of integration, improper integrals, polar coordinates, sequences and infinite series, power series, and introduction to differential equations. Specific topics by class day are attached.

Goals: (1) Students should have a basic understanding of derivative, of antiderivative, and of limit. (2) Students should be able to use the rules of differentiation as they apply to algebraic and transcendental functions. (3) Students should be able to evaluate a variety of limits. (4) Students should be able to sketch graphs of transcendental functions by building on concepts from Math 111. (5) Students should be able to demonstrate appropriately the methods of integration (substitution, parts, trigonometric substitution, partial fractions) and use these methods with typical indefinite, definite, and improper integrals. (6) Students should be able to graph and to find area using simple polar coordinate expressions. (7) Students should be able to determine convergence of appropriate infinite series by giving logical arguments. (8) Students should have a basic understanding of power series and be able to determine the domain of appropriate power series. (9) Students should be able to derive a power series expression for certain transcendental expressions using a geometric series or Taylor's Theorem. (10) Students should be able to use technology to produce appropriate graphs of variations on functions typically used in this course. (11) Students should be able to solve simple first-order differential equations.

Major Tests/Final Exam: Four major tests will be given at 7:45 a.m. in Seney rooms 208 and 209 on the following mornings: **September 26, October 12, November 14, and December 7.** The final exam will be comprehensive and will be given according to the final exam schedule. Each student is expected to take tests at the scheduled times. Any conflicts or problems will be handled on an individual basis. If the excuse is considered

legitimate by your instructor, arrangements will be made to take a test on the afternoon prior to the testing time. Emergencies will be handled on an individual basis.

Quizzes: All quizzes are announced and "take home"; however, the student must be present in class to receive the quiz. The student must work each quiz at one sitting and use only the reference sheet provided for this course. There should be no discussion of quizzes until after they are turned in for grade. Quizzes are due at class time on the class day following the indicated day on the assignment sheet attached. Each quiz is worth 25 points and the best six quizzes will be used to help determine the student's grade.

Computer Portfolio: Using Graphmatica in the computer laboratory in Pierce Hall or a personal computer, the student is to prepare a portfolio of computer printouts showing a minimum of twelve (and maximum of twenty) distinctly different graphs. Each function needs to be clearly identified. The student must give the important aspects of graphing by labeling these aspects on no fewer than three graphs. Each portfolio should include a variety of functions (algebraic, transcendental and Polar Coordinates). In addition to the required graphs, the student should compose functions to produce pictures for a theme or story for a second set of graphs. Accuracy, clarity, organization , and originality are important in your portfolio. Up to 100 points is given for the technical aspects and up to 100 points for original theme and graphs. Examples of previous portfolios can be seen in the instructor's office, Seney 303, during office hours. Due **Monday, October 30**, class time.

Homework: Homework assignments and specific topics included in this course are attached. Assignments will not be collected but are for the students benefit. It is important that the student successfully complete a majority of the problems assigned. Students will need to spend at least 2 productive hours of study for each class session, or 6 to 8 hours per week. Students should not get behind or wait until the night before a test to study.

Attendance: The student is expected to attend all classes since the student is responsible for work covered in class and any announcements made in class. An inordinate amount of absences will be handled in accordance with school policies.

Grading: The final course grade will be determined as follows:

Major tests (4 @ 100 points)	400 points
Quizzes (best 6 @ 25 points)	150 points
Graphing Portfolio	200 points
Final Exam	250 points
TOTAL	1000 points

In general,

A, A-: 900 points and above
B+, B, B-: 800-899 points
C+, C, C-: 700-799 points
D+, D: 600-699 points
F: below 600 points

Tutoring and Supplemental Instruction: Student tutors will be available to help with homework problems. A schedule giving specific times is forthcoming. Tutors will be located in the Gregory room during evening hours. Use student tutors only at their appointed times. The SI leaders for Math 112, are Joel Boggan and Matt Elliott. They will schedule optional study sessions to review calculus concepts, to help students discover how best to study calculus, and (if needed) to orient students to the use of computers in the laboratory. Check the course conference for announcements.

Summary of Important Dates:

September 4	Labor Day
September 26	Test I
October 12	Test 2
October 16, 17	Midsemester Break
October 30	Computer Project
November 14	Test 3
November 22-26	Thanksgiving Break
December 7	Test 4
December 11	Last Class Day
December 13	Reading Day

HONOR CODE: THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT IN THIS COURSE, AND ALL SUCH WORK WILL BE PLEDGED TO BE YOURS AND YOURS ALONE. THIS INCLUDES THE TESTS, QUIZZES, REPORTS AND THE COMPUTER PROJECT.

Specific Topics and Homework Assignments

Wednesday, August 30 Review functions, limits

p. 44: 5,6,7,9-12,47-52,103,107,109,111,117
p. 53: 1-15 odd, 19, 21, 23, 31-34, 39, 41, 43, 45, 49, 51, 53, 73, 75

Friday, September 1 Review functions, limits

p. 80: 11-37 odd, 47-61 odd
p. 92: 1,2,3,5-10,11-27 odd, 31-53 odd
p. 101: 1,3,9-29 odd

Monday, September 7 is Labor Day

Wednesday, September 6 L'Hôspital's Rule (7.7)
Friday, September 8

Read section 7.7
p. 530: 5-43 odd
finish previous homework

Monday, September 11 Differentiation

p. 129: 9,15,37,43,47
p. 140: 5,7,15,19,23,25,31,35,41,45
p. 153: 7,11,23,27,31,37,47,49,53,59,65,69,89,125,127,129
p. 163: 5,7,13,15,17,19,27,29,39,41,43,45
QUIZ 1

Monday, September 13 Graphing polynomials, rational functions

CLASS NOTES

Friday, September 15 Graphing logarithmic and exponential functions

CLASS NOTES

Monday, September 18 Review integration

p. 307: 5,9
p. 319: 5,11,15,21,25,29
p. 332: 13,17,23,33,37,47,69,71,73,75
p. 348: 1,5,9,15,27
p. 355; 1,9,13,17,25,29,31
p. 479: 15-46 all
QUIZ 2

Wednesday, September 20 Integration by Parts

p. 487: 9-36 (all), 39,41,43

Friday, September 22 More Substitution

p. 496: 3-31 odd

Monday, September 25 Review

Test 1 on September 26 at 7:45 in Seney 208 and 209

Wednesday, September 27 Trigonometric Substitution

p. 505: 17-36 all, 38-46 all

Friday, September 29 Partial Fractions
Monday, October 2

p. 515: 7-30 (all)
QUIZ 3 (Monday)

Wednesday, October 4 Improper Integrals (7.8)
Friday, October 6

p. 540: 9-33 odd
p. 542: 11-36, 55-59, 69-79 odd
QUIZ 4 (FRIDAY)

Monday, October 9 Review
Wednesday, October 11

Test 2 on October 12 at 7:45 in Seney 208 and 209

Friday, October 13 Discuss Graphing Portfolios

Begin preparing your portfolio

October 14-17 **Mid Semester Break**

Wednesday, October 18 Polar Coordinates
Friday, October 20

CLASS NOTES
p. 678: 1-6, 21-35
p. 687: 3-15 odd, 27,29,31

Monday, October 23 Review graphing and area in Polar Coordinates
QUIZ 5

Wednesday, October 25 Infinite Sequences

p. 555: 1-16, 23-45 odd, 51-65 odd

Friday, October 27 Infinite Series

p. 564: 1-26, 31-43 odd, 49-59

Monday, October 30 Computer Project Due - Be ready to present

Wednesday, November 1 Integral Test and p-series
Friday, November 3

p. 571: 1-22 all

Monday, November 6 Comparisons of Series

p. 578: 3-36 all
handout 3.1
QUIZ 6

Wednesday, November 8 Alternating Series

p. 587: 9-28, 37-51 odd

Friday, November 10 Ratio and Root Test

Study Example 5, p. 592
p. 594: 11-30 all, 33-37 all, 41-58 all
handout 3.2

Monday, November 13 Review Infinite Series and p. 593
Handout Review

Test 3 on Thursday, November 14

Wednesday, November 15 Power Series

p. 613: 1-29 odd, 39

Friday, November 17 Power Series
Monday, November 20

p. 620: 5-16 all
QUIZ 7 (Friday)

Wednesday, November 22 - Sunday, November 26 is Thanksgiving Break

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Monday, November 27 Taylor and Maclaurin Series (8.10)
Wednesday, November 29

p. 630: 1-8 all, 17-24 all
p. 632: 9-15 odd, 23, 25, 35-45 all, 49-54 all, 55
handout

Friday, December 1 Introduction to Differential Equations
Monday, December 4

CLASS NOTES
p. 391: 33-55 odd
p. 400: 5-12
QUIZ 8 (Friday)

Wednesday, December 6	Review

Test 4 on Thursday, December 7 at 7:45 in Seney 208 and 209

Friday, December 8	Review for final
Monday, December 11	