

Mathematics 112 Spring, 2003

Textbook: Larson, Hostetler, Edwards, Calculus, 3rd edition

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

Office Hours: 10-11;30 TTh; 1:30 – 3:30 W; others posted weekly

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Learn Link: There is a conference, Math 112 spring 2003, for all students enrolled in Math 112. 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 110B, 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 specified 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 (separable, exact, linear).

Major Tests/Final Exam: Four major tests will be given at 7:45 a.m. in Seney room 215 on the following mornings: **February 6, February 27, March 27, and April 22**. 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. Any student requiring special testing arrangements must provide documentation and give sufficient time for appropriate arrangements to be made.

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.

Gateway Test: Passing the Gateway Test is a requirement for passing Math 112. To pass this test, a student must get six out of eight problems totally correct. Forty points are given for six correct problems, forty-five points are given for seven correct problems, and fifty points are given for a perfect paper. There are five opportunities scheduled to take the Math 112 Gateway Test: **February 11, March 4, April 3, April 15, April 24**. You may retake this test to improve your point total. The highest point total on any test will be used to help determine course grade. This test includes two limits to evaluate, two derivatives to differentiate, and four integrals to evaluate.

Graphing Portfolio: Students 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 displays of graphs, both technical and thematic. Each function is to be clearly identified by the formula. Use algebraic, trigonometric (including inverse trigonometric functions), logarithmic and exponential functions, polar graphs, or combinations of them. The student must have at least three graphical displays where the important features of the graphs are clearly labeled (maximum, minimum, inflection points, etc.) One of these must be a polar graph with maximum r given. These are the technical graphs. The remaining graphs should be linked by a theme and should combine several functions to make picture displays. These are the thematic graphs.

Evaluations of the portfolio will be based on the selection of graphs, the documentation associated with the graphs, the completeness of the technical graphs, the creativity of the thematic graphs, and the oral presentations of the portfolio. Accuracy, clarity, organization, neatness and originality are important in the finished product. Workers in the computer lab may help with the use of the computer and software, but students must choose their own functions and create their own printouts and portfolios. This assignment is due on **Wednesday, April 2** at class time. Oral presentations will be given on **Wednesday, April 2** and **Friday, April 4**. Students will be called randomly to make their presentations.

Homework: Homework assignments and specific topics included in this course are attached. Handouts (homework and class notes) are available on electronic reserve in the Library. Assignments will not be collected. It is important that the student successfully complete a majority of the problems assigned. Students will need to spend at least 3 productive hours of study for each class session, or 9 to 12 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 for 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
Gateway Test	50 points
Graphing Portfolio	200 points
Final Exam	<u>250 points</u>
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 available in the Gregory room during evening hours. Use student tutors only at their appointed times. The SI leaders for Math 112 are Arielle Alford and Natalie Henderson. They will schedule optional SI 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:

January 20	MLK Holiday
February 6	Test I
February 11	Gateway Test 1
February 27	Test 2
March 4	Gateway Test 2
March 10-14	Spring Break
March 27	Test 3
April 2	Computer Project
April 3	Gateway Test 3
April 15	Gateway Test 4
April 22	Test 4
April 24	Gateway Test 5
April 28	Last Class Day
April 30	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, January 15 Review Differentiation/Logarithmic Differentiation

p. 156: 17, 19, 25, 31, 33, 35
p. 157: 59, 61, 63, 69, 71, 73, 75, 79, 81, 83, 85, 87, 93, 103, 105
p. 166: 7, 9, 11, 15, 17, 31, 33
p. 167: 41, 43, 45, 55-64 all
p. 173: 13, 17, 19, 29, 31, 33, 35, 37

Friday, January 17 Review integration (7.1)
(Substitution)

Methods of Integration handout on electronic reserve

p. 486: 19, 21, 25, 27, 37, 39, 43, 45, 47, 49, 51, 53

Wednesday, January 22 Integration by Parts (7.2) and substitution (7.3)
 Friday, January 24

p. 494: 9, 13, 17, 21, 23, 29, 35, 47, 49, 55
p. 503: 3, 7, 9, 11, 13, 15, 23, 27, 31, 35, 37
p. 504: 57, 61, 63, 65, 67

QUIZ 1 (Wednesday)

Monday, January 27 Trigonometric Substitution (7.4)

p. 512: 23, 27, 33, 35, 37, 41, 43, 45, 47, 49

Wednesday, January 29 Partial Fractions (7.5)
Friday, January 31

p. 522: 9, 11, 13, 15, 17, 19, 21, 23, 25, 31, 41, 43, 45

QUIZ 2 (Friday)

Monday, February 3 Review for test 1

Wednesday, February 5

Review for Test 1 handout on electronic reserve

Test 1 on February 6 at 8:00 a.m. in Seney 215.

Friday, February 7 L'Hospital's Rule (7.7)

Handout on electronic reserve

p. 537: 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35

Monday, February 10 Improper Integrals (7.8)
Wednesday, February 12

p. 547: 9, 15, 17, 21, 23, 27, 31, 37, 41

p. 550: 3, 5, 9, 13, 15, 19, 21, 23, 25, 27, 31, 33, 35, 59, 61, 63, 65, 71-82 all

QUIZ 3 (Wednesday)

Gateway Test 1 (Tuesday, February 11)

Friday, February 14 Graphing logarithmic and exponential graphs
Monday, February 17

Handout on electronic reserve

QUIZ 4 (Monday)

Wednesday, February 19 Polar Coordinates (9.4, 9.5)
Friday, February 21

Handout on electronic reserve

p. 691: 21-35 odd, 37, 39, 45, 53, 91-98 all

p. 700: 1-7 odd, 9, 11, 13, 15, 17, 27, 29, 31

QUIZ 5 (Friday)

Monday, February 24 Review for test 2
Wednesday, February 26

Review for Test 2 handout on electronic reserve

Test 2 on Thursday, February 27 at 8:00 a.m. in Seney 215.

Friday, February 28 Infinite Sequences (8.1)

p. 564: 1-11 odd, 17-20 all, 27, 29, 31-41 odd, 47-49 odd

Handout on electronic reserve

Monday, March 3 Infinite Series (8.2)

p. 573: 17-24 all, 33-46 all

Handout on electronic reserve

Gateway Test 2 (Tuesday, March 5)

Wednesday, March 5 nth term Test, Integral Test and p-series (8.3)
Friday, March 7

p. 573: 7-16 all
p. 580: 1-8 odd, 11-20 all
p. 582: 53-64 all
handout 3.1

QUIZ 6 (Wednesday)

March 10-14 is Spring Break

Monday, March 17 Comparisons of Series (8.4)

p. 587: 3-36 odd
handout 3.2

Wednesday, March 19 Alternating Series (8.5)

p. 595: 9-26 odd, 41-55 odd, 69-77 odd
QUIZ 7

Friday, March 21 Ratio and Root Test (8.6)

p. 602 – study: p. 603: 5-10 all, 13-39 odd, 43-59 odd
handout: Review Infinite Series
QUIZ 8

Monday, March 24 Review Infinite Series

Wednesday, March 26

Review for Test 3 handout on electronic reserve

Test 3 on Thursday, March 27 at 8:00 a.m. in Seney 215

Friday, March 28 Power Series (8.8)

p. 23: 1-37 odd, 39-46 all
Handout on electronic reserve

Monday, March 31 Power Series (8.9)

p. 630: 1-25 odd, 43-46 all

Wednesday, April 2 Present Computer Projects
Friday, April 4

QUIZ 9 (Wednesday)
Gateway Test 3 (Thursday, April 3)

Monday, April 7 Review Power Series
Wednesday, April 9

p. 643: 1-6 all, 9-16 all, 23-30 all, 37-52 all
Handout on Reserve

Friday, April 11 Taylor and Maclaurin Series
Monday, April 14

p. 638: Review Chart
p. 641: 1-12 all, 19-27 all
p. 644: 57, 58, 73-92 all
QUIZ 10 (Monday)
Gateway Test 4 (Tuesday, April 15)

Wednesday, April 16 Review
Monday, April 21

Review for Test 4 handout on electronic reserve
Friday, April 18 (no class) Good Friday

Test 4 on Tuesday, April 22 at 8:00 a.m. in Seney 215

Wednesday, April 23 Introduction to Differential Equations
Friday, April 25

p. 392: 7-17 odd; 33-57 odd
p. 402: 3-11 odd
Handout on electronic reserve
Gateway Test 5 (Thursday, April 24)

Monday, April 28 Evaluation, discuss final exam

Review for Final handout available on electronic reserve

Wednesday, April 30 Reading Day

The Final Exam will be given in accordance to the final exam schedule and college policies.