

Mathematics 112 Spring, 2002

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

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

Office Hours: 10-11:30 TTH; 2-3:30 MWF; others by appointment;

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Learn Link: There is a conference, Math 112, 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 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 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 8:00 a.m. in Seney rooms 215 and 209 on the following mornings: **February 7, February 28, April 2, and April 25**. 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.

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), 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 presentation 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 10 at class time. Oral presentations will be given on Wednesday, April 10 and Friday, April 12. 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 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	150 points
Final Exam	<u>300 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 located in the Gregory room during evening hours. Use student tutors only at their appointed times. The SI leaders for Math 112, are Melissa Crowe and Jessica Poole. 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 21	MLK Holiday
February 7	Test I
February 28	Test 2
March 11-15	Spring Break
April 2	Test 3
April 10	Computer Project
April 25	Test 4
April 29	Last Class Day
May 1	Reading Day
May 7	2:00 Final (8:30 class)
May 8	2:00 Final (9:35 class)

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 16 Review Differentiation

p. 123: 9, 13, 15
p. 134: 13, 15, 33, 39, 45, 49, 51, 53, 57
p. 145: 17, 23, 25, 27, 31-47 ODD, 49, 51, 57, 59, 61, 63, 75, 79
p. 155: 11, 15, 21, 23, 25, 27, 29, 43, 45, 47, 49, 53, 59, 61, 65, 69, 73, 79, 83,
87, 89, 91
p. 163: 1-19 odd, 21, 25, 27, 31, 41, 43, 45, 53, 55
p. 330: 3-21 Odd
p. 337: 11-27 all
Handout (Review Differentiation)

Friday, January 18 Review integration (7.1, 7.3)
Wednesday, January 23 (Substitution)

[Methods of Integration handout on electronic reserve]

p. 301: 5, 11, 21, 25, 31
p. 313: 5, 11, 13, 19, 21, 23, 37, 39, 45, 49, 55, 57, 59, 61-77 odd
p. 341: 5, 7, 13, 15, 17, 21, 23, 25, 29, 31, 41, 45, 49, 57, 59
p. 356: 1, 3, 5
p. 368: 31-47 odd, 51, 53
p. 386: 1-43 odd, 45, 47
p. 476: 1-59 odd
p. 496: 5, 9, 15, 19, 21, 27, 29, 35, 39-47 Odd, 49-56 all, 67

QUIZ 1 (Wednesday)

Friday, January 25 Integration by Parts (7.2)

p. 486: 1-29 odd, 31-42 all, 47, 53, 54, 55, 56, 57, 61, 63, 69

Monday, January 28 Trigonometric Substitution (7.4)

p. 506: 5, 7, 11, 15, 19-46 all, 51

Wednesday, January 30 Partial Fractions (7.5)
Friday, February 1

p. 517: 7-25 odd, 31, 33, 43-48 all
QUIZ 2 (Friday)

Monday, February 4 Review for test 1
Wednesday, February 6

Review for Test 1 handout on electronic reserve

Test 1 on February 7 at 8:00 a.m. in Seney 215.

Friday, February 8 L'Hospital's Rule (7.7)

Handout on electronic reserve

p. 532: 1-26 all, 27-30 all

Monday, February 11 Improper Integrals (7.8)

Wednesday, February 13

p. 543: 1-6 all, 7-31 odd, 33, 34, 55, 59, 61, 62

p. 545: 1, 5, 7, 9, 11-35 odd, 37, 39, 45, 47, 49

QUIZ 3 (Wednesday)

Friday, February 15 Graphing logarithmic and exponential graphs

Monday, February 18

Handout on electronic reserve

QUIZ 4 (Monday)

Wednesday, February 20 Polar Coordinates (10.3, 10.4)

Friday, February 22

Handout on electronic reserve

p. 694: 1-25 odd, 27, 37, 38, 51, 53, 55, 59

p. 703: 1-12 all, 13, 15, 17, 27, 29, 31

QUIZ 5 (Friday)

Monday, February 25 Review for test 2

Wednesday, February 27

Review for Test 2 handout on electronic reserve

Test 2 on Thursday, February 28 at 8:00 a.m. in Seney 215.

Friday, March 1 Infinite Sequences (8.1)

p. 557: 1-53 odd, 55, 57, 65, 67

Handout on electronic reserve

Monday, March 4 Infinite Series (8.2)

p. 566: 1-27 odd, 41-51 odd

Handout on electronic reserve

Wednesday, March 6 nth term Test, Integral Test and p-series (8.3)
Friday, March 8

p. 573: 1-31 odd, 33, 34,
handout 3.1
QUIZ 6 (Wednesday)

March 11-15 is Spring Break

Monday, March 18 Comparisons of Series (8.4)

p. 579: 1-25 odd, 27-34 all
handout 3.2

Wednesday, March 20 Alternating Series (8.5) and Review
Friday, March 22

p. 587: 1-35 odd
QUIZ 7 (Friday)

Monday, March 25 Ratio and Root Test (8.6)
Wednesday, March 27

p. 594: 1-4 all, 5-24 odd, 25, 26, 35-51 odd
handout: Review Infinite Series
QUIZ 8 (Wednesday)

Friday, March 29 Review Infinite Series
Monday, April 1

Review for Test 3 handout on electronic reserve

Test 3 on Tuesday, April 2 at 8:00 a.m. in Seney 215

Wednesday, April 3 Power Series (8.8)

p. 613: 1-35 odd, 37, 38
Handout on electronic reserve

Friday, April 5 Power Series (8.9)
Monday, April 8

p. 620: 1-25 odd

Wednesday, April 10 Present Computer Projects
Friday, April 12

QUIZ 9 Wednesday

Monday, April 15 Taylor and Maclaurin Series (8.10)
Wednesday, April 17

p. 630: 1-8 all, 17-24 all
p. 632: 1-9 odd, 23, 13-19 odd, 27-38 all, 41-46 odd
Review Power Series handout

Friday, April 19 Introduction to Differential Equations
Monday, April 22

Handout on electronic reserve
QUIZ 10 (Friday)

Wednesday, April 24 Review

Review for Test 4 handout on electronic reserve

Test 4 on Thursday, April 25 at 8:00 a.m. in Seney 215

Friday, April 26 Review for final
Monday, April 29

Review for Final handout available on electronic reserve

Wednesday, May 1 Reading Day

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

8:30 class at 2:00 on Tuesday, May 7
9:35 class at 2:00 on Wednesday, May 8