Mathematics 112
Spring, 2004

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

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Office Hours: 10-11;30 TTh; 1:30 – 3:30 W; others by appointment

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Learn Link: There is a conference, Math 112 spring 2004, 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, AP Calculus with placement or placement). 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. on the following mornings: **February 5, February 26, March 25, and April 20.** 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 at 8:30 a.m.: **February 10, March 2, April 1, April 13, April 22**. 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 (at least one using L'Hospital's rule), two derivatives to differentiate (one implicit and one logarithmic), and four integrals to evaluate (one of each general type).

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. Students must choose their own functions and create their own printouts and portfolios. This assignment is due on **Friday, April 2** at class time. Oral presentations will be given on **Friday, April 2**. 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		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 available in the Gregory room during evening hours. Use student tutors only at their appointed times. Your SI leaders (Corey and Woon) 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 for the graphing portfolio. Check the course conference for announcements.

Summary of Important Dates:

January 19	MLK Holiday
February 5	Test I
February 10	Gateway Test 1
February 26	Test 2
March 2	Gateway Test 2
March 8-12	Spring Break
March 25	Test 3
April 1	Gateway Test 3
April 2	Computer Project
April 13	Gateway Test 4
April 20	Test 4
April 22	Gateway Test 5
April 26	Last Class Day
April 28	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 14 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 16 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 21 Integration by Parts (7.2) and substitution (7.3)
Friday, January 23

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 26 Trigonometric Substitution (7.4)

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

Wednesday, January 28 Partial Fractions (7.5)
Friday, January 30

p. 522: 9, 11, 13, 15, 17, 19, 21, 23, 25, 31, 41, 43, 45
QUIZ 2 (Friday)

Monday, February 2 Review for test 1
Wednesday, February 4
Review for Test 1 handout on electronic reserve

Test 1 on February 5 at 7:45 a.m.

Friday, February 6 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 9 Improper Integrals (7.8)
Wednesday, February 11

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 10 at 8:30 a.m.)

Friday, February 13 Graphing logarithmic and exponential graphs
Monday, February 16

Handout on electronic reserve
QUIZ 4 (Monday)

Wednesday, February 18 Polar Coordinates (9.4, 9.5)
Friday, February 20

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 23 Review for test 2
Wednesday, February 25

Review for Test 2 handout on electronic reserve

Test 2 on Thursday, February 26 at 7:45 a.m.

Friday, February 27 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 1 Infinite Series (8.2)

p. 573: 17-24 all, 33-46 all
Handout on electronic reserve
Gateway Test 2 (Tuesday, March 2 at 8:30 a.m.)

Wednesday, March 3 nth term Test, Integral Test and p-series (8.3)
Friday, March 5

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 8-12 is Spring Break

Monday, March 15 Comparisons of Series (8.4)

p. 587: 3-36 odd
handout 3.2

Wednesday, March 17 Alternating Series (8.5)

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

Friday, March 19 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 22 Review Infinite Series
Wednesday, March 24

Review for Test 3 handout on electronic reserve

Test 3 on Thursday, March 25 at 7:45 a.m.

Friday, March 26 Power Series (8.8)

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

Monday, March 29 Power Series (8.9)
Wednesday, March 31

p. 630: 1-25 odd, 43-46 all
Gateway Test 3 (Thursday, April 1 at 8:30 a.m.)

Friday, April 2 Present Computer Projects

QUIZ 9 (Wednesday)

Monday, April 5 Review Power Series
Wednesday, April 7

p. 643: 1-6 all, 9-16 all, 23-30 all, 37-52 all
Handout on Reserve
No class Friday, April 9

Monday, April 12 Taylor and Maclaurin Series
Wednesday, 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 13 at 8:30 a.m.)

Friday, April 16 Review
Monday, April 19

Review for Test 4 handout on electronic reserve

Test 4 on Tuesday, April 20 at 7:45 a.m.

Wednesday, April 21 Introduction to Differential Equations
Friday, April 23

p. 392: 7-17 odd; 33-57 odd
p. 402: 3-11 odd
Handout on electronic reserve
Gateway Test 5 (Thursday, April 22 at 8:30 a.m.)

Monday, April 26 Evaluation, discuss final exam

Review for Final handout available on electronic reserve

Wednesday, April 28 Reading Day

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