

Mathematics 112 **Spring, 2005**

Textbook: Larson, Hostetler and Edwards, Calculus of a Single Variable: Early Transcendental Functions, D.C. Heath and Company, 3rd edition

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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, Math110B, 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: At the completion of the class, students should have (1) a basic understanding of derivative, of antiderivative, and of limit; (2) a basic understanding of power series and be able to determine the domain of appropriate power series. Students should also be able to (1) use the rules of differentiation as they apply to algebraic and transcendental functions; (2) evaluate a variety of limits; (3) sketch graphs of transcendental functions by building on concepts from Calculus I; (4) demonstrate appropriately the methods of integration (substitution, integration by parts, trigonometric substitution, partial fractions) and use these methods with typical indefinite, definite, and improper integrals; (5) graph and find area using simple polar coordinate expressions; (6) determine convergence of appropriate infinite series by giving logical arguments; (7) derive a power series expression for certain transcendental expressions using a geometric series or Taylor's Theorem; (8) use technology to produce appropriate graphs of variations on functions typically used in this course; (9) solve simple first-order differential equations.

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.

Homework: Specific topics included in this course are attached. Although homework assignments are not collected, it is important that the student successfully complete 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. Sleep is important prior to tests.

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 grades. Quizzes are due at class time on the class day indicated on the assignment sheet. There are a total of eight quizzes. Each quiz is worth 25 points and the best six quizzes will be used to help determine the student's grade.

Major Tests/Final Exam: Four major tests will be given. 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. Documented special accommodations for test taking must be cleared several days prior to the test date so that appropriate arrangements can be made.

Gateway Exam: In order to pass Math 112, the student must pass a Gateway exam. This exam is made up of eight problems as follows: two limits to evaluate (at least one requiring L'Hospital's Rule), two differentiation problems (any transcendental function may be included), and four integration problems (one needing u-substitution, one needing trigonometric substitution, one needing integration by parts, and one needing partial fractions). To pass this test, a student must work at least six problems correctly. Points will be earned as follows:

all eight problems correct	100 points
seven problems correct	90 points
six problems correct	80 points

Calculators: Calculators will **not** be allowed on tests or quizzes.

e-Reserves/WebSite: The student is responsible for obtaining the handouts on e-Reserves through the library web page. Handouts include information and exercises to supplement the textbook.

In addition, there is a Graphing Tutorial at the following web site, which is accessible through e-Reserve:

<http://www.oxford.emory.edu/OXFORD/RESTRICTED/UNIVERSITY/Classes/Chen/Calculus/Index.htm>

Learnlink: There is a class conference on Learnlink, **Math112 Spring 2005**. Announcements, scheduled SI sessions, questions related to problems, and other information can be posted at any time. Students may ask questions and make requests of a general nature on this conference. Individual concerns should be sent directly to your professor. Students should place this conference on their desktop and check frequently.

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	100 points
Final Exam	<u>250 points</u>
TOTAL	900 points

Tutoring and Supplemental Instruction: Student tutors will be available to help with homework problems. A schedule giving specific times will be available after the first week of classes. Tutors will be located in the Gregory room during the hours posted.

The SI leaders for Math 112 Spring 2005 will be announced. They schedule study sessions to review calculus concepts, to help students discover how best to study calculus. Check the course conference on Learnlink for announcements.

Written Style: Neatness is one way of showing courtesy toward your instructor and pride in your work. Thoughts in mathematics are expressed in sentences, such as " $1 + 1 = 2$ ". There is a subject " $1 + 1$ ", a verb "=", and a predicate "2". The student should strive to be neat and to use mathematical symbols appropriately.

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.

Tentative Calendar of Topics and Homework Assignments (Subject to Adjustments)

Wednesday, January 19 Review functions, limits

e-Reserve: Introductory Topics

Textbook:

p. 45: 91, 95, 107, 111

p. 54: 25, 35

p. 83: 7, 13, 15, 19, 31

p. 94: 1-6, 7, 9, 11, 17, 25

p. 95: 41, 45, 51, 55

Friday, January 21 Review functions, limits

Review Differentiation

e-Reserve: Introductory Topics

Textbook:

p. 106: 15, 17, 19, 21, 23, 37, 39, 41, 55

p. 237: 13, 15, 17, 19

Study Table on page 173

p. 143: 23-53 odd

p. 156: 9-35 odd, 55-93 odd

p. 166: 1-19 odd

p. 173: 13, 17, 19

p. 191: 67-91 odd, 119 – 125 odd

Monday, January 24 L'Hôpital's Rule (Section 7.7)

Wednesday, January 26

Friday, January 28

e-Reserve: Introductory Topics

Textbook:

Study Section 7.7

p. 537: 5-35 odd

Monday, January 31 Graphing logarithmic and exponential functions

e-Reserve: Graphing Segment 1 – Review Graphing polynomials, rational functions
Graphing Segment 2 - Graphing logarithmic and exponential functions

Calculus Page: Graphing Tutorial, access via e-Reserve

Wednesday, February 2 Review integration

e-Reserve: Integration; Math112 Reference Sheet

Textbook:

p. 331: 11, 17, 21, 29, 33, 47, 49, 53, 57, 59, 65, 67, 93, 97, 103, 105

p. 348: 3, 5, 7, 9, 17, 27, 31

p. 355: 1, 5, 13, 19, 21, 23, 25, 27, 29, 31, 33, 37, 41

p. 486: 7, 13, 15, 23, 27, 37, 39, 47, 53

Friday, February 4 Integration by Parts

e-Reserve: Integration

Textbook:

Study Section 7.2

p. 494: 5, 7, 9, 11, 17, 21, 27, 29, 33, 35

Monday, February 7 Review for Test 1

e-Reserve: Review for Test 1

Test 1

Tuesday, February 8 at 7:45 a.m.

Wednesday, February 9 More Substitution

e-Reserve: Integration

Integrals involving trigonometric functions

Textbook:

Study Section 7.3

p. 503: 3 – 15 odd, 21-37 odd, 61-67 odd

Friday, February 11 Trigonometric Substitution

e-Reserve: Integration

Textbook:

Study Section 7.4

p. 512: 5, 9, 13, 17-37 odd, 43, 45, 47, 49

Monday, February 14 Partial Fractions

Wednesday, February 16

e-Reserve: Integration

Textbook:

Study Section 7.5

p. 522: 7-27 odd, 41, 43, 45

Friday, February 18 Improper Integrals

Monday, February 21

e-Reserve: Improper Integrals

Textbook:

Study Section 7.8

p. 547: 9-25 odd

p. 550: 1-35 odd, 47-57 odd

Wednesday, February 23 Review for Test 2

e-Reserve: Review for Test 2

Test 2

Thursday, February 24 at 7:45 a.m.

Friday, February 25 Polar Coordinates

Monday, February 28

Wednesday, March 2

Friday, March 4

e-Reserve: Polar Coordinates

Calculus Page: Graphing Tutorial, access via e-Reserve

Textbook:

Study Section 9.4 and Section 9.5 Area part

p. 690: Study the Special Polar Graphs

p. 691: 21-35 odd, 67-85 odd

p. 700: 3-21 odd

p. 711: 53, 55, 87

Monday, March 7

Review graphing and area in Polar Coordinates

Gateway 1

Tuesday, March 8 at 8:30 a.m.

Wednesday, March 9

Infinite Sequences

Friday, March 11

e-Reserve: Sequences

Textbook:

Study Section 8.1

p. 564: 1- 11 odd, 31, 33, 35, 37, 39, 47-63 odd

March 14 – March 18 Spring Break

Monday, March 21

Infinite Series

Wednesday, March 23

e-Reserve: Infinite Series

Textbook:

Study Section 8.2

p. 573: 1-23 odd, 33-39 odd

Gateway 2

Tuesday, March 22 at 8:30 a.m.

Friday, March 25

Integral Test and p-series

Monday, March 28

e-Reserve: Infinite Series

Textbook:

Study Section 8.3

p. 580: 1-23 odd, 53-64

Wednesday, March 30

Comparisons of Series

e-Reserve: Infinite Series

Textbook:

Study Section 8.4

p. 587: 3-27 odd, 29-36

Friday, April 1 Alternating Series

e-Reserve: Infinite Series

Textbook:

Study Section 8.5

p. 595: 9-31 odd, 41-55 odd, 69-77 odd

Monday, April 4 Ratio and Root Test

e-Reserve: Review Infinite Series

Textbook:

Study Section 8.6

Study Example 5, p. 601

see p. 602 Summary of Tests for Series

p. 603: 1-10 all, 13-31 odd, 35-41 odd, 43-59 odd, 61, 63

Gateway 3

Tuesday, April 5 at 8:30 a.m.

Wednesday, April 6 Review Infinite Series

Friday, April 8 Review for Test 3

e-Reserve: Review for Test 3

Monday, April 11 Power Series

e-Reserve: Power Series

Textbook:

Study Section 8.8

p. 623: 1-37 odd

Test 3

Tuesday, April 12 at 7:45 a.m.

Wednesday, April 13 Power Series

Friday, April 15

Monday, April 18

e-Reserve: Power Series, Review Power Series, Extra Notes on Power Series

Textbook:

Study Section 8.9

p. 630: 1-16 odd

Gateway 4

Tuesday, April 19 at 8:30 a.m.

Wednesday, April 20 Taylor and Maclaurin Series (8.10)

Friday, April 22

e-Reserve: Power Series

Textbook:

Study Section 8.7 and 8.10

See p. 638 Power Series for Elementary Functions
 p. 641: 1-12 all
 p. 643: 1-6 all, 9-15 odd, 23-29 odd, 37-51 odd, 65-70 all

Monday, April 25 Review for Test 4

Wednesday, April 27

e-Reserve: Review for Test 4

Test 4 Thursday, April 28 at 7:45 a.m.

Friday, April 29 Introduction to Differential Equations: Exact and linear

e-Reserve: Differential Equations

Textbook:

Study Sections 5.2 and 5.3

p. 392: 33-57 odd

p. 402: 3-11 all

Monday, May 2 Review for Final

e-Reserve: Review for Final

Gateway 5 – Last Chance! Tuesday, May 3 at 8:30 a.m.
