

Mathematics 112/112Z
Fall, 2003

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 grade. Quizzes are due at class time on the class day indicated on the assignment sheet. 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 at 7:45 a.m. in Seney on the following mornings: **September 23, October 9, November 11, and December 4.** 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.

Computer Portfolio: Using Graphmatica, the student is to prepare a portfolio of computer printouts showing a minimum of twelve (and maximum of twenty) distinctly different pages of 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. In addition to the required or technical graphs, the student should compose functions to produce pictures illustrating a theme or a story for a second set of graphs, the thematic graphs. Each portfolio should include a variety of functions (algebraic, transcendental and Polar Coordinates). Accuracy, clarity, organization, and originality are important in your portfolio. This assignment is due on **Monday, November 24 at class time**. Oral presentations will be given on Monday, November 24. Students should not wait until the end of the semester to do this project. Use your time wisely throughout the semester. Examples of previous portfolios can be seen in Dr. Evelyn C. Bailey's office, Seney 303, during office hours.

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	50 points
seven problems correct	45 points
six problems correct	40 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, **Math 112 Fall 2003**. 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
Graphing Portfolio	150 points
Gateway Test	50 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 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 are Woon Cho Kim and Corey Orton. They 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 on learnlink for announcements.

Summary of Important Dates:

September 1	Labor Day
September 23	Test 1
October 7	Gateway 1
October 9	Test 2
October 13, 14	Midsemester Break
October 21	Gateway 2
October 28	Gateway 3
November 4	Gateway 4
November 11	Test 3
November 18	Gateway 5
November 24	Computer Project Due
November 26-28	Thanksgiving Break
December 2	Gateway 6
December 4	Test 4
December 8	Last Class Day
December 10	Reading Day

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, August 27 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, August 29 Review functions, limits

e-Reserve: Introductory Topics

Textbook:

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

p. 237: 13, 15, 17, 19

Monday, September 1 is Labor Day

Wednesday, September 3 L'Hôpital's Rule (Section 7.7)

Friday, September 5

e-Reserve: Introductory Topics

Textbook:

Study Section 7.7

p. 537: 5-35 odd

Monday, September 8 Differentiation

e-Reserve: Introductory Topics

Textbook:

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

QUIZ 1

Wednesday, September 10 Graphing polynomials, rational functions

e-Reserve: Graphing Segment 1
Calculus Page: Graphing Tutorial, access via e-Reserve

Friday, September 12 Graphing logarithmic and exponential functions

e-Reserve: Graphing Segment 2

Monday, September 15 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

QUIZ 2

Wednesday, September 17 Integration by Parts

e-Reserve: Integration

Textbook:

Study Section 7.2

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

Friday, September 19 More Substitution

e-Reserve: Integration

Textbook:

Study Section 7.3

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

Monday, September 22 Review for Test 1

e-Reserve: Review for Test 1

Test 1 on September 23 at 8:00 in Seney 215

Wednesday, September 24 Trigonometric Substitution

e-Reserve: Integration

Textbook:

Study Section 7.4

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

Friday, September 26 Partial Fractions

Monday, September 29

e-Reserve: Integration

Textbook:

Study Section 7.5

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

QUIZ 3 (Monday)

Wednesday, October 1 Improper Integrals

Friday, October 3

e-Reserve: Improper Integrals

Textbook:

Study Section 7.8

p. 547: 9-25 odd

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

QUIZ 4 (FRIDAY)

Monday, October 6 Review for Test 2

e-Reserve: Review for Test 2

Tuesday, October 7 at 8:30 **Gateway 1** Seney 215

Wednesday, October 8 Review for Test 2

Test 2 on October 9 at 8:00 in Seney 215

Friday, October 10 Discuss Graphing Portfolios

Begin preparing your portfolio

October 13-14 Mid Semester Break

Wednesday, October 15 Polar Coordinates

Friday, October 17

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, October 20 Review graphing and area in Polar Coordinates

Tuesday, October 21 at 8:30 **Gateway 2** Seney 215

Wednesday, October 22 Infinite Sequences

e-Reserve: Sequences

Textbook:

Study Section 8.1

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

QUIZ 5

Friday, October 24 Infinite Series

Monday, October 27

e-Reserve: Infinite Series

Textbook:

Study Section 8.2

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

Tuesday, October 28 at 8:30 **Gateway 3** Seney 215

Wednesday, October 29 Integral Test and p-series

Friday, October 31

e-Reserve: Infinite Series

Textbook:

Study Section 8.3

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

Monday, November 3 Comparisons of Series

e-Reserve: Infinite Series

Textbook:

Study Section 8.4

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

Tuesday, November 4 at 8:30 **Gateway 4** Seney 215

Wednesday, November 5 Alternating Series

e-Reserve: Infinite Series

Textbook:

Study Section 8.5

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

QUIZ 6

Friday, November 7 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

Monday, November 10 Review Infinite Series

e-Reserve: Review for Test 3

Test 3 on Tuesday, November 11 at 8:00 in Seney 215

Wednesday, November 12 Power Series

e-Reserve: Power Series

Textbook:

Study Section 8.8

p. 623: 1-37 odd

Friday, November 14 Power Series

Monday, November 17

e-Reserve: Power Series, Review Power Series

Textbook:

Study Section 8.9

p. 630: 1-16 odd

QUIZ 7 (Friday)

Tuesday, November 18 at 8:30 **Gateway 5** Seney 215

Wednesday, November 19 Taylor and Maclaurin Series (8.10)

Friday, November 21

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, November 24 Computer Project Due – be ready to present

QUIZ 8

November 26 – 28 Thanksgiving

Monday, December 1 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

 Tuesday, December 2 at 8:30 **Gateway 6** Seney 215

Wednesday, December 3 Review for Test 4

e-Reserve: Review for Test 4

Test 4 on Thursday, December 4 at 8:00 in Seney 215

Friday, December 5 Review for final

Monday, December 8

e-Reserve: Review for Final

Final exam according to the college final exam schedule. Given in classroom.