Mathematics 112
Spring, 2001

<u>Textbook</u>: Larson, Hostetler, Edwards, <u>Calculus</u>, 2nd edition

<u>Instructor</u>: Dr. Evelyn C. Bailey, Office in Seney 303

<u>Office Hours</u>: MTWTh: 1:15 - 3:30; others by appointment; email: <u>ebailey@emory.edu</u> or Evelyn Bailey on LearnLink

<u>Learn Link</u>: 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.

<u>Content</u>: 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.

<u>Goals</u>: (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).

<u>Major Tests/Final Exam</u>: Four major tests will be given at 7:45 a.m. in Seney room 215 on the following mornings: **February 8, March 1, April 3, and April 26.** 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 <u>prior</u> to the testing time. Emergencies will be handled on an individual basis.

<u>Quizzes</u>: All quizzes are announced and "take home"; however, the student <u>must</u> be present in class to receive the quiz. The student <u>must</u> 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.

<u>Computer Portfolio</u>: Using Graphmatica in the computer laboratory in Pierce Hall or a personal computer, the student is to prepare a portfolio of computer printouts showing a minimum of twelve (and maximum of twenty) distinctly different graphs. Each function used needs to be clearly identified. The student must give the important aspects of graphing by labeling these aspects on no fewer than three graphs. Each portfolio should include a variety of appropriate functions (especially transcendental functions and Polar Coordinate graphs). In addition to the required graphs and for a second set of graphs, the student should compose and/or combine functions to produce pictures for a theme or story. Accuracy, clarity, organization, originality and completion of a theme are important in your portfolio. Up to 100 points are given for the technical aspects and presentation. Up to 100 points are given for original theme and graphs. Examples of previous portfolios can be seen in the instructor's office, Seney 303, during office hours. You will be expected to present your portfolio to the class on the due date, **April 11**.

<u>Homework</u>: 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.

<u>Attendance</u>: 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.

<u>Grading</u>: 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	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

<u>Tutoring</u> and <u>Supplemental</u> <u>Instruction</u>: 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 Joel Boggan and Matt Elliott. 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.

<u>Summary</u> of <u>Important</u> <u>Dates</u>:

February 8	Test I
March 1	Test 2
March 12-16	Spring Break
April 3	Test 3
April 11	Computer Project
April 13	No Class (Good Friday)
April 26	Test 4
April 30	Last Class Day
May 2	Reading Day

<u>HONOR</u> <u>CODE</u>: 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 17   Review Differentiation
Friday, January 19

      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)

Monday, January 22   Review integration (7.1, 7.3)
Wednesday, January 24   (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 26   Integration by Parts (7.2)

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

Monday, Jaunary 29   Trigonometric Substitution (7.4)

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

Wednesday, January 31   Partial Fractions (7.5)
Friday, February 2

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

Monday, February 5   Review for test 1
Wednesday, February 7
      Review for Test 1 handout on electronic reserve

Test 1 on February 8 at 7:45 a.m. in Seney 215.

Friday, February 9   L'Hospital's Rule (7.7)

Handout on electronic reserve
p. 532: 1-26 all, 27-30 all

Monday, February 12   Improper Integrals (7.8)
Wednesday, February 14

     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 16   Graphing logarithmic and exponential graphs
Monday, February 19

Handout on electronic reserve
QUIZ 4 (Monday)

Wednesday, February 21   Polar Coordinates (10.3, 10.4)
Friday, February 23

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 26   Review for test 2
Wednesday, February 28

Review for Test 2 handout on electronic reserve

Test 2 on Thursday, March 1 at 7:45 a.m. in Seney 215.

Friday, March 2   Infinite Sequences (8.1)

   p. 557: 1-53 odd, 55, 57, 65, 67
Handout on electronic reserve

Monday, March 5   Infinite Series (8.2)

    p. 566: 1-27 odd, 41-51 odd
Handout on electronic reserve

Wednesday, March 7   nth term Test, Integral Test and p-series (8.3)
Friday, March 9

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

March 12-16 is Spring Break

Monday, March 19   Comparisons of Series (8.4)

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

Wednesday, March 21   Alternating Series (8.5) and Review
Friday, March 23

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

Monday, March 26   Ratio and Root Test (8.6)
Wednesday, March 28

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

Friday, March 30   Review Infinite Series
Monday, April 2

    Review for Test 3 handout on electronic reserve

Test 3 on Tuesday, April 3 at 7:45 a.m. in Seney 215

Wednesday, April 4   Power Series (8.8)

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

Friday, April 6   Power Series (8.9)
Monday, April 9

      p. 620: 1-25 odd

Wednesday, April 11 Present Computer Projects

      QUIZ 9

Friday, April 13   **No Class**, Good Friday

Monday, April 16   Taylor and Maclaurin Series (8.10)
Wednesday, April 18

      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 20   Introduction to Differential Equations
Monday, April 23

      Handout on electronic reserve
      QUIZ 10 (Friday)

Wednesday, April 25 Review

      Review for Test 4 handout on electronic reserve

      Test 4 on Thursday, April 26 at 7:45 a.m. in Seney 215

Friday, April 27   Review for final
Monday, April 30

      Review for Final handout available on electronic reserve

Wednesday, May 2   Reading Day

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