

**Mathematics 112/112Z**  
**Fall, 2001**

**Textbook:** Larson, Hostetler, and Edwards, *Calculus of a Single Variable: Early Transcendental Functions*, Second Edition.

**Instructor:** Dr. Michael Rogers.

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Hours: **MWThF 2–3 p.m.** and by appt.

**Course Content:** Mathematics 112/112Z is the second semester of first-year calculus. The main topics are the analysis of exponential, logarithmic, and inverse trigonometric functions; methods of integration; L'Hôpital's rule; improper integrals; polar coordinates; infinite sequences and series; power series; and differential equations.

**Course Goals:** The manifest goal is to complete the foundation for the student's understanding and computational ability in the calculus of single-variable functions. After this course, the student should be able to do the following: to find the limits, derivatives, and integrals (including improper integrals) to a wide variety of algebraic and transcendental functions; to apply various methods in finding those integrals, namely, substitution, partial integration, partial fractions; to graph polar coordinate equations and to find the areas of simple regions given in polar coordinates; to determine the convergence of appropriate infinite series; to understand the general theory of power series and to determine the domain of appropriate power series; to derive the power series for certain functions using a geometric series, term-by-term differentiation or integration, or Taylor's Theorem; to apply the calculus to power series; to solve simple first-order differential equations.

**Grading:** Grading will be based on the following written work:

Tests (4 @ 100 pts)	400 points
Quizzes (8 @ 25 pts)	200 points
Computer Graphing Portfolio	150 points
Final	250 points
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Total	1000 points

The plus/minus system will be used. A rough guide to grades: A:  $\geq 900$  pts. B: 800–900 pts. C: 700–800 pts. D: 600–700 pts. F:  $< 600$  pts.

**Tests:** Four tests will be given at **8:00 a.m.** on the following Thursdays:

**September 27, October 11, November 15, December 6**

Calculators will not be allowed on tests.

You are expected to take tests at the scheduled times. Any conflicts or problems will be handled on an individual basis. If you have an excuse deemed legitimate by your instructor, arrangements will be made for you to take a test **prior to** the testing time.

**Quizzes:** All quizzes are announced and “take-home.” You must be present in class to receive your quiz. You must work each quiz at *one sitting* and use only *authorized materials*. In general no books, notes or calculators will be allowed. Quizzes are due in class on the class day following your receipt of them. Each quiz is worth 25 points. Three quizzes will be given during each test unit and the best two of them will be used in determining your grade. In total there will be 12 quizzes of which 8 will be counted.

**Computer Graphing Portfolio:** Using Graphmatica, a graphing application available through the campus network, the student is to prepare a portfolio of computer printouts showing a minimum of twelve (and maximum of twenty) distinctly different 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. Each portfolio should include a variety of functions (algebraic, transcendental) and in both cartesian and polar coordinate systems. In addition to the three or more required graphs, the student should compose functions to produce pictures for a theme or story to form a second set of graphs. Accuracy, clarity, organization, and originality are important in your portfolio. Up to 75 points are given for the technical aspects and up to 75 points for original theme and graphs.

**Homework:** Assignments from your text will be given. These assignments will not be collected but are for your benefit. **The purpose of calculation is insight** (Gauss). It is important that you complete assignments as they are assigned and that you not wait until a few days prior to a test to do homework. Collaboration is encouraged as discussion of the concepts often leads to their clarification. **However be sure that you can solve problems unaided.** Use good style on your homework. In general you need to spend at least 6-8 good hours per week on study not counting the time spent taking quizzes and reviewing for tests.

**Use Good Style:** Thoughts are expressed by sentences: just so in mathematics. **Written work must be in complete sentences.** The same applies to daily homework. See Priestley, “Clean Writing in Mathematics,” pp. 413–420 in *Calculus: An Historical Approach*, which is on reserve.

**Miscellaneous Support:** There is a LearnLink conference, Math 112, for all students enrolled in Math 112/112Z. Announcements, questions, and information may be posted at any time.

Student tutors will be available and a schedule will be announced.

The SI leaders for Math 112/112Z are Melissa Crow and Jessica Poole. They will 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 for announcements.

**Honor Code:** The Honor Code of Oxford College applies to all work submitted for credit in this course. To receive credit for work submitted you must place your name on it. By placing your name on such work, you pledge that the work has been done in accordance with the given instructions and that you have witnessed no Honor Code violations in the conduct of the assignment.