

Math 113: Calculus II, Section 14

Syllabus: Winter 2010

Instructor: Forcade, TMCB 316, 422-2379, forcader@math.byu.edu

Office Hours: 9-9:50 Daily, 2-2:50 TuTh

Classroom and Time: 108 TMCB, 3pm Daily

Text: *Calculus, 6E, Volume 2* by James Stewart.

Course Objectives: Mastery of the "core topics" of Math 112, consisting of most of the material in chapters 6-11 of the text.

Prerequisite: Successful completion of Math 112 or its equivalent with a grade of C- or better.

Preparation Time: Adequately prepared students should expect to spend a minimum of three hours of work outside of class for each credit hour. This adds up to a minimum of 12 hours per week for math 113. A minimal time commitment is likely to lead to an average grade B-/C+ or lower. Much more time may be required to achieve excellence.

Learning Outcomes: Mastery of the "core topics" of Math 113, consisting of most of the material in chapters 6-11 of the text (excluding chapter 9). This includes (but may not be limited to) the following concepts:

Techniques of Integration:

Students will be able to find antiderivatives of a wide variety of functions, including polynomial, rational, irrational, trigonometric, inverse trigonometric, logarithmic, exponential, and hyperbolic functions and their combinations, find these antiderivatives by hand, using the techniques of integration by substitution, integration by parts, integration by partial fractions and trigonometric substitutions., change limits in a definite integral when changing the variables, demonstrate knowledge of the difference between an integral and an improper integral, deal with both types of improper integrals, those on an unbounded interval and those involving an unbounded integrand, and resolve questions of convergence for improper integrals using comparison tests, limit comparison tests, and direct application of the definition of what it means for an improper integral to converge.

Applications of Integration:

Students will be able to use the definite integral to model and resolve problems in physics and geometry, including problems involving area between graphs of functions, mass, arc length, volumes and surface area, and use the techniques of finding volumes by slicing and by shells.

Sequences and Series:

Students will be able to recall and use a correct definition of limit of a sequence, recall and use the definition of infinite series and know the difference between an infinite series and sequence, use theorems about monotone sequences to assert convergence of a sequence, test a series of constants for conditional or absolute convergence and understand the meaning of absolute and conditional convergence, find the sum of a convergent geometric series and apply it to practical problems, compute Taylor polynomials centered at various points using the formula for Taylor series, recall

or compute Taylor series for basic functions, including remainder terms, use the remainder term of a Taylor series to estimate the error in the approximation of the function, know the Maclaurin series for the functions e^x , $\ln(1+x)$, $\sin(x)$, $\cos(x)$ and $\frac{1}{1-x}$, find the radius of convergence and interval of convergence of a power series, differentiate and integrate functions expressed as a sum of a power series and understand the statements of the theorems used to do this, and recall and compute binomial series.

Parametric Equations and Polar Coordinates:

Students will be able to use parametric equations to represent a wide variety of curves, find arc lengths and tangent lines of parametric curves, transform coordinates and curves between rectangular and polar coordinates, find areas enclosed by polar curves, find arc lengths and tangent lines of polar curves; and parameterize ellipses and circles.

Assignments: Assignments will generally be collected in class on Mondays, Wednesdays, and Fridays. Late homework will not be accepted. The lowest five homework scores will not be figured into your final grade. This accommodates for minor illnesses or others disruptions to your regular schedule that might prevent you from turning an assignment in on time. Solutions should be clearly labeled and in order. The style of your written solutions should be very much like that of a text book example; solutions should contain enough explanation so that one of your classmates would be able to easily understand what you have done. Generally, it is inadequate to merely write down a final answer. You are strongly encouraged to study together and work together on homework assignments. However, you each must submit your own assignment. Everything you turn in should be in your own words and you should thoroughly understand everything you write down. The homework grader will only grade selected exercises. Therefore it is important for you to solve each one.

Grading: Assignments, 25%, mid-terms 45%, final exam 30%, subject to modification as implied by the following section.

Common Final Exam and Grades: A common final exam is given to all students in all sections of Math 112. This assists the Mathematics Department to fairly assess students' knowledge of calculus and to assign grades fairly. The percentile ranking of each student relative to all students in all sections will be computed based on the final exam scores. Using this information the Calculus Committee will compute an average grade for each section. It is department policy that the average grade for each section should match its average grade on the common final exam. No calculators, books, or notes will be permitted during the final exam. The final exam will be given on Saturday, April 17 from 7-10 a.m. The room will be announced later in the semester. It will likely *not* be your assigned classroom.

Preventing Sexual Harassment: Title IX of the Education Amendments of 1972 prohibits sex discrimination against any participant in an educational program or activity that receives federal funds. The act is intended to eliminate sex discrimination in education and pertains to admissions, academic and athletic programs, and university-sponsored activities. Title IX also prohibits sexual harassment of students by university employees, other students, and visitors to campus. If you encounter sexual harassment or gender-based discrimination, please talk to your professor; contact the Equal Employment Office at 801-422-5895 or 1-888-238-1062 (24-hours), or <http://www.ethicspoint.com>; or contact the Honor Code Office at 801-422-2847.

Students with Disabilities: BYU is committed to providing reasonable accommodation to qualified persons with disabilities. If you have any disability that may adversely affect your success in this course, please contact the University Accessibility Center at 422-2767. Services deemed appropriate will be coordinated with the student and instructor by that office.