

Math 113 Sections 2-7: Calculus II

Syllabus: Fall 2017

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Office Hours: MWF 2-3

Website: math.byu.edu/~bakker (go here for copies of syllabus, schedule, and lectures notes)

Classroom and Time: MWF 10:00-10:50 in JKB 3108

Text: *Calculus: Early Transcendentals, Volume 2, 8th edition* by James Stewart.

Course Objectives: Mastery of the “core topics” of Math 113, consisting of most of the material in chapters 6,7,8,10,11 of the text.

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

Textbook and WebAssign Information: You are not required to purchase a textbook for this course. You will automatically have access to an eBook through WebAssign. After the add/drop deadline, you can purchase a loose-leaf hard copy of the book at the Bookstore. You can also print pages from the book through WebAssign.

To enroll in WebAssign, you will need the Class Key: **byu 5123 1272**

You will be charged automatically from your student account after the add/drop deadline. WebAssign includes access to both the online homework and the eBook.

Preparation Time: Adequately prepared students should expect to spend a minimum of three hours of work 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.

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.

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 $\exp(x)$, $\sin(x)$, $\cos(x)$, and $1/(1-x)$, and 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.

Written Assignments: Approximately half of the homework is in written format. Written assignments will generally be collected in class on Mondays, Wednesdays, and Fridays. Late homework will not be accepted. The lowest three lowest written homework scores and the three lowest online 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 attempt each one.

Solution Manuals: A legally purchasable student solution manual is available from the publisher of the textbook with solutions to most of the odd numbered exercises. It is not a violation of the BYU Honor Code to read the student solution manual. However, directly copying a solution from one of these manuals onto your homework is plagiarism and is a violation of the Honor Code. Over-reliance on solution manuals is nearly always detrimental to learning and often results in poor performance on exams. The best learning will take place when you attend class, study and ponder the textbook carefully, conscientiously complete homework assignments, discuss the concepts with your classmates, cultivate a genuine desire to understand the subject, ask questions, work hard, and follow other strategies that have proven themselves to be useful for effective learning.

Online Assignments: Approximately half of the homework is completed using the online homework system WebAssign. Generally, these assignments are due on the day following instruction. The lowest three online homework scores will not be figured into your final grade.

Calculators: You may use calculators for written and online homework problems. But calculators will not be permitted for midterms exams nor the final exam.

Useful Web Sites:

- **Online Homework:** <https://www.webassign.net/>
- **Old Final Exams:** Exams from previous semesters are at <https://math.byu.edu/home/undergraduate/exams>
- **Math Lab Hours:** Go to <https://math.byu.edu/home/mathlab>

Grading:

25% Assignments

50% 2 Common Midterm Exams

25% Common Final Exam

Common Final Exam and Grades: A common final exam is given to all students in all sections of Math 113. 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 is scheduled for

Sat. Dec 16 from 6 p.m. to 9 p.m.

Because we schedule a single time for all students to take the final exam, you might see a different time listed if you log onto BYU's web page and check your final exam schedule. If a different time is listed it is *wrong!* For students with legitimate scheduling conflicts with other final exams, we will provide an alternative final exam time. 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.