

SYLLABUS

Calculus I

Fall 2013

Math 112

Instructor: Eric Nordmoe
Office: OU203E
Drop-in Hours: MW 10-11:30 R 1:30-2:30
Phone: 337-7066
E-mail: enordmoe@kzoo.edu
Class web page: <http://people.kzoo.edu/enordmoe/math112/>

Goals:

Skill	Goal	Primary Assessment
Mechanics and computation	Use the techniques of the course to manipulate functions, find limits, and compute derivatives.	Routine homework, mastery exams.
Application	Apply the course skills to solve problems requiring application of Calculus techniques.	Midterm exams, final exam
Mathematical maturity	Be able to read, write, and speak the language of mathematics.	Routine homework, group work, class participation

Approach:

The Rule of Four: Topics will be considered from four complementary and contrasting mathematical points of view: descriptive, algebraic, numerical, and graphical.

Topics:

1. **Functions:** introduction and review of functions used in the course.
2. **The Derivative:** careful presentation and development of the concepts of the derivative and integral according to the Rule of Four.
3. **Finding and Applying the Derivative:** the symbolic approach to differentiation and real-world applications of the derivative.

Resources:

- Stewart, James (2009). *Calculus Concepts and Contexts 4th ed.*, James Stewart, 2004, Brooks/Cole Publishing.
- Graphing calculator comparable to a TI-84 or TI-86. (The TI-83 and TI-85 are also acceptable.)

Evaluation:

Grades will be assigned based on the following components and corresponding weights:

Component	Purpose	Weight
Online Warm-ups	To <i>develop</i> mastery of the core course concepts.	10
Routine Homework and Participation	To <i>develop</i> mastery of the course concepts, to practice <i>written</i> communication of mathematics, and to be good citizens of the class community.	20%
Algebra Mastery Exam	To <i>display</i> mastery of algebra skills needed for active engagement in the study of calculus. The only possible scores are 100%, which corresponds to demonstration of mastery, and 0%. The exam may be repeated as many times as necessary. Deadline: Tuesday, Sept. 24, 4pm.	5
Differentiation Mastery Exam	To <i>display</i> mastery of the standard rules for differentiation: product, quotient and chain rules. The format is the same as for the Algebra Skills Mastery Exam from weeks 1 and 2. Deadline: Tuesday, Nov. 19, 4pm.	10
Midterm Exams	To <i>display</i> the ability to <i>apply</i> Calculus techniques to solve new problems.	30
Final Exam	To <i>display</i> the ability to synthesize and apply Calculus techniques to solve new problems.	25

Tentative Schedule:

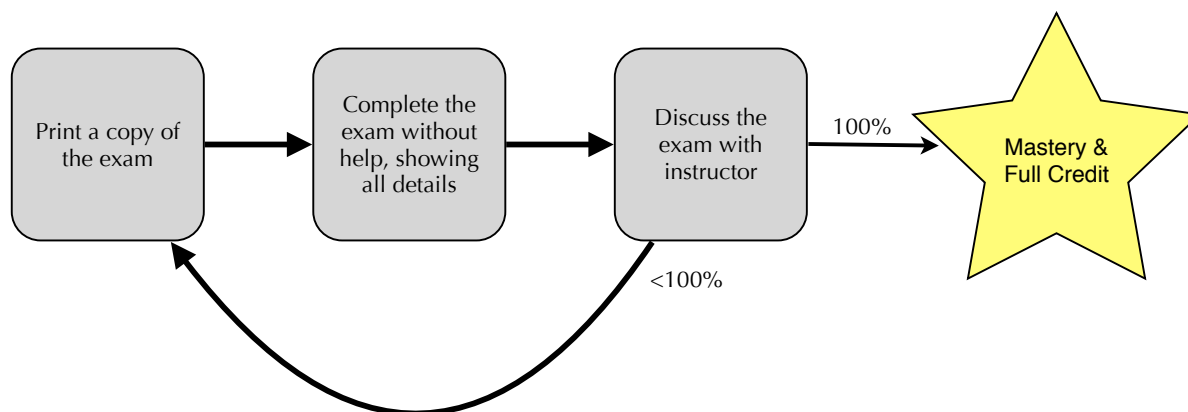
Week	Sections	Topics
1	1.1-1.3, 1.5-1.6	Reviewing functions
2	1.7, 2.1-2.4	Parametric curves, limits, and continuity
3	2.6-2.8, 3.1	Definition of the derivative, the derivative function; Derivatives of polynomials and exponential functions
4	3.2	Product and quotient rules; Review; Exam I
5	3.3-3.5	Derivatives of trig functions; Chain rule; Implicit differentiation
6	3.6-3.7	Derivatives of inverses; Derivatives of log functions
7	3.8-3.9; 4.2	Applications; Linear approximations and differentials; Maximum and minimum values
8	4.1	Related rates; Review; Exam II
9	4.3, 4.5-4.6; 2.5	Derivatives and the shape of curves; Optimization; l'Hospital's Rule
10	4.9	Antiderivatives; Review
11	---	FINAL EXAM

Tentative Dates:

Exam I	October 11 (Friday, Week 4)
Exam II	November 8 (Friday, Week 8)
Final Exam	November 25, 8:30-11am (Monday, Exam week)

Mastery Exams:

These exams are opportunities to display personal mastery of essential skills of algebra and, later, differentiation. The only possible scores on the exam are 100%, which corresponds to demonstration of mastery, and 0%. The exam may be repeated as many times as necessary, as illustrated by the diagram below.

**Midterm Exams:**

Two midterm exams will be given during the quarter according to the schedule above. Make-ups will only be given in extraordinary circumstances and must be discussed with me at least one week in advance of the regularly scheduled date.

Homework assignments and Presentations:

Reading will be assigned every class period. Two kinds of homework problems will also be assigned: "warm-up" and "hand-in" problems. The warm-up problems are based on material from the previous lecture and are designed to prepare you to solve the hand-in problems from the same sections that will be collected at the following class session. You will use the WebAssign system that accompanies our text to complete these problems with instant feedback. As some of these problems have random components, the problems you see may be slightly different than those your classmates see but the underlying concepts and techniques will be the same. You may ask questions about these problems in class or during office hours. Carefully solving these warm-up problems will be excellent preparation for solving the hand-in problems to be submitted for grading.

Assigned "hand-in" problems are due at the beginning of class. Assigned problems will be read and graded on a scale of 0 to 2. To receive full credit on a problem, the solution must be complete, well organized, and clearly written in complete detail. Correct answers alone may receive a score of 0. You are permitted and in fact encouraged to collaborate on homework assignments but you must write up your solutions independently and *in your own words*. Copying another student's solutions is not acceptable and will result in a grade of 0 for the entire assignment. All homework is due at the beginning of class on the date assigned. Late homework will only be accepted when accompanied by a note from a doctor or the student health clinic. If you must miss class, please make prior arrangements to ensure that your homework is handed in on time.

Attendance:

Attendance at all class sessions is expected. If you must miss a class for a legitimate reason, you should be sure to consult one of your colleagues to find out what you missed.

Classroom Participation:

Consistent with the interactive nature of this class, you are expected to come prepared for class and to participate actively. Active participation means contributing to discussions of the entire class and working with partners or groups on the classroom activities. From time to time, write-ups of classroom activities will be collected. Successful participation in these activities and contribution to class discussion will be the basis for decisions on borderline grades.

Academic Dishonesty:

Representing another's work as one's own (i.e., copying) on exams and homework is a violation of the Kalamazoo College Honor Code and will result in failure of the course.

Special Accommodation:

Any student with a disability who needs an accommodation or other assistance in this course should make an appointment to speak with me as soon as possible.