Calculus II

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Goals:

Skill	Goal	Primary Assessment
Mechanics	Mastery of the traditional techniques	Routine homework,
and	of integral calculus.	mastery exams.
computation		
Application	Apply the course skills to solve	Midterm exams, final exam
	problems requiring application of	
	Calculus II techniques.	
Mathematical	Be able to read, write, and speak the	Homework and class
maturity	language of mathematics.	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. **Integrals:** definition of the integral; methods of integration including substitution, integration by parts, use of computer algebra methods, and improper integrals.
- 2. **Applications of integration:** volumes of revolution, cylindrical shells, calculation of arc lengths and applications to probability.
- 3. **Sequences and series:** working with sequences and series; testing for convergence; representation of functions as infinite series.

Required Resources:

- Stewart, James (2009). *Calculus Concepts and Contexts, 4th ed.,* James Stewart, Brooks/Cole Publishing.
- WebAssign website for warmup problems. Enroll at <u>http://webassign.net/login.html</u>. Use the class key to enroll and choose whether you would like single term/lifetime access to homework and, if desired, the Stewart text eBook.
- Graphing calculator comparable to a TI-83 or TI-86. The TI-89 and TI-Nspire are not allowed on exams.

Evaluation:

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

Component	Purpose	Weight
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%
Warm-up Problems	To <i>develop</i> mastery of the core course concepts.	10
Differentiation Mastery Exam	To <i>display</i> mastery of the standard rules for differentiation you should have learned in Calc I: product, quotient, chain rules, and logarithmic differentiation. 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, September 20, 4pm.	5
Calculus II Skills Mastery Exam	To <i>display</i> mastery of the standard Calculus II skills including integration and convergence of series. The format is the same as for the Differentiation Mastery Exam from weeks 1 and 2. Deadline: Thursday, Nov. 17, 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	4.8, 5.1-5.2	Antiderivatives; Areas and distances and the definite integral.	
2	5.3-5.5	Evaluating definite integrals; the FTC; the substitution rule.	
3	5.6-5.10	Integration techniques; Improper integrals.	
4	6.1	Areas Review; Exam I.	
5	6.2	Volumes; Mid-autumn Break.	
6	6.3-6.5	Volumes (cont'd); Arc length and average value of a function.	
7	6.8; 8.1	Applications; Sequences.	
8	8.2	Series; Review.	
9	8.3-8.4	Exam II; Tests for convergence of series	
10	8.4-8.7	Power series; Taylor and Maclaurin series.	

Tentative Dates:

Exam I	October 7 (Friday, Week 4)	
Exam II	November 7 (Monday, Week 9)	
Final Exam	November 22, 1:30-4pm (Tuesday)	

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. Selected problems will be read and graded on a scale of o 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. Copying another student's solutions is *not* acceptable and will result in a grade of o for the entire assignment.

Late homework assignments will not be accepted. Instead, the 2 lowest homework scores for each student will be dropped before calculating the homework grade.

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.