Mathematics 112   Fall, 2009

<u>Textbook</u>:   Stewart, <u>Single Variable Calculus</u>: 6th edition

<u>Instructor</u>:   Fang Chen, Office - Pierce 120A, Phone: 770-784-4639, e-mail: fchen2@emory.edu

<u>Office Hours</u>:   Mondays, Wednesdays 2 – 4 pm (subject to change) or by appointments

<u>Content</u>: Mathematics 112 is the second semester of calculus and is designed specifically for students who have completed a semester of college calculus (Math 111, Math 111Z, Math110B, or AP Calculus). Course content includes methods of integration, improper integrals, polar coordinates, sequences and infinite series, power series, and introduction to differential equations. Specific topics by class day are attached.

<u>Goals</u>: At the completion of the class, students should have (1) a basic understanding of derivative, of antiderivative, and of limit; (2) a basic understanding of power series and be able to determine the domain of appropriate power series. Students should also be able to (1) use the rules of differentiation as they apply to algebraic and transcendental functions; (2) evaluate a variety of limits; (3) sketch graphs of transcendental functions by building on concepts from Calculus I; (4) demonstrate appropriately the methods of integration (substitution, integration by parts, trigonometric substitution, partial fractions) and use these methods with typical indefinite, definite, and improper integrals; (5) graph and find area using simple polar coordinate expressions; (6) determine convergence of appropriate infinite series by giving logical arguments; (7) derive a power series expression for certain transcendental expressions using a geometric series or Taylor's Theorem; (8) solve simple first-order differential equations.

<u>Attendance</u>: The student is expected to attend all classes since the student is responsible for work covered in class and for any announcements made in class. An inordinate amount of absences will be handled in accordance with school policies.

<u>Homework</u>: Specific topics included in this course are attached. Homework will be assigned in the outlines posted after each lecture on the Blackboard site. Homework will be collected and graded regularly. Although only selected problems will be checked, it is important that the student successfully complete all the problems assigned.

Students will need to spend at least 2 productive hours of study for each class session, or 6 to 8 hours per week.   Students should not get behind or wait until the night before a test to study. Sleep is important prior to tests.

<u>Gateway Test</u>: In order to pass Math 112, the student must pass a Gateway exam. This exam is made up of eight problems as follows: two limits to evaluate (at least one requiring L'Hospital's Rule), two differentiation problems (any transcendental function may be included), and four integration problems (one needing u-substitution, one needing trigonometric substitution, one needing integration by parts, and one needing partial fractions). To pass this test, a student must work at least six problems correctly. Points will be earned as follows:

all eight problems correct	100 points
seven problems correct	90 points
six problems correct	80 points

<u>Major Tests:</u> Three major tests will be given. All of the tests will be comprehensive. The final exam will be comprehensive and will be given according to the final exam schedule.

Each student is expected to take tests at the scheduled times. Any conflicts or problems will be handled on an individual basis. If the excuse is considered legitimate by your instructor, arrangements will be made to take a test on the afternoon **prior to** the testing time. Emergencies will be handled on an individual basis. Documented special accommodations for test taking must be cleared several days prior to the test date so that appropriate arrangements can be made.

Problem Sets: There will be three take-home, open-book problem sets. Each problem set is worth 50 points. Students will working in groups of two.

Calculators: Calculators will **not** be allowed on any work handed in for grades.

Grading: The final course grade will be determined as follows:

Major Tests (3 @ 100 points)	300 points
Gateway Test	100 points
Problem Sets (3 @ 50 points)	150 points
Homework	100 points
Final Exam	250 points
TOTAL	900 points

In general, letter grades will be determined as follows:
     A: 91% and above;   B: 81 – 90%; C: 71 – 80 %; D: 61 - 70%; F: less than 59%

Grades of A-, B+, B-, C+, C-, D+ may be assigned for percentages near the above cut-offs.

Blackboard Website: There is a course website on the Blackboard: http://classes.emory.edu Outlines for each lecture (including homework assignment and extra handouts) will be posted after every class. Announcements, scheduled SI sessions, questions related to problems, and other information can be posted at any time. Students may ask questions and make requests of a general nature on the site (individual concerns should be sent directly to your professor). The student is responsible for checking the site every day and obtaining homework assignment, extra handouts and other related information.

Supplemental Instruction, Tutoring and Study Groups: The SI leaders will be announced. They schedule study sessions to review calculus concepts, to help students discover how best to study calculus. Check the Blackboard for announcements.

Contact Mr. Paul Oser, Director of the Mathematics Center for tutoring hours.

Study groups, organized by students are highly recommended.

Written Style: Neatness is one way of showing courtesy toward your instructor and pride in your work. Thoughts in mathematics are expressed in sentences, such as "1 + 1 = 2". There is a subject "1 + 1", a verb "=", and a predicate "2". The student should strive to be neat and to use mathematical symbols appropriately.

THE HONOR CODE OF OXFORD COLLEGE APPLIES TO ALL WORK SUBMITTED FOR CREDIT IN THIS COURSE. BY YOUR SIGNATURE ON SUCH WORK YOU PLEDGE THAT WORK WAS DONE IN ACCORDANCE WITH THE RULES STIPULATED ON THE WORK OR IN THIS SYLLABUS.

Tentative Course Calendar – Subject to Change (Math112, Fall 2009)

26-Aug	Wednesday	Review Functions, Limits
28-Aug	Friday	Review Functions, Limits, Differentiation
31-Aug	Monday	L'Hopital's Rule
2-Sep	Wednesday	L'Hopital's Rule
4-Sep	Friday	L'Hopital's Rule
9-Sep	Wednesday	Graphing logarithmic and exponential functions
11-Sep	Friday	Review Integration
14-Sep	Monday	Integration by Parts
16-Sep	Wednesday	Integrals with Trig Functions; Review for Test 1
18-Sep	Friday	Integrals with Trig Functions; Review for Test 1
18-Sep	**Friday**	**Test 1, 2:15 p.m. – 4 p.m.**
21-Sep	Monday	Trigonometric Substitution
23-Sep	Wednesday	Partial Fractions
25-Sep	Friday	Partial Fractions
28-Sep	Monday	Improper Integrals
30-Sep	Wednesday	Improper Integrals
2-Oct	Friday	Polar Coordinates
5-Oct	Monday	Polar Coordinates
7-Oct	Wednesday	Polar Coordinates
8-Oct	**Thursday**	**Gateway Test 1, 8:30 a.m. – 9:30 a.m.**
9-Oct	Friday	Review graphing and area in polar coordinates
14-Oct	Wednesday	Review for Test 2
16-Oct	Friday	No Class
16-Oct	**Friday**	**Test 2, 2:15 p.m. – 4 p.m.**
19-Oct	Monday	Infinite Sequences
21-Oct	Wednesday	Mathematical Induction
23-Oct	Friday	Infinite Series
26-Oct	Monday	Infinite Series
28-Oct	Wednesday	n-th Term Test and Integral test
30-Oct	Friday	Integral test and p-series
2-Nov	Monday	Integral test and p-series
4-Nov	Wednesday	Comparisons of Series
6-Nov	Friday	Alternating Series
9-Nov	Monday	Ratio and Root Test
10-Nov	**Tuesday**	**Gateway Test 2, 8:30 a.m. – 9:30 a.m.**
11-Nov	Wednesday	Review Infinite Series
13-Nov	Friday	Introduction to Differential Equations: Separable and Exact
16-Nov	Monday	Power Series
18-Nov	Wednesday	Power Series, Review for Test 3
20-Nov	Friday	Power Series, Review for Test 3
20-Nov	**Friday**	**Test 3, 2:15 p.m. – 4 p.m.**
23-Nov	Monday	Power Series
30-Nov	Monday	Power Series
1-Dec	**Tuesday**	**Gateway Test 3, 8:30 a.m. – 9:30 a.m. Last Chance!**
2-Dec	Wednesday	Taylor and Maclaurin Series
4-Dec	Friday	Taylor and Maclaurin Series
7-Dec	Monday	Review Power Series, Evaluations, Last Day of Class