Mathematics 112/112Z, Fall, 2011

Textbook: Stewart, Single Variable Calculus: Early Transcendentals, 7th edition

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Office Hours: Mondays, Wednesdays 2:30 – 4:30 pm and by appointments

Content: Mathematics 112 is the second semester of calculus and is designed specifically for students who have completed a semester of college calculus (Math 111, 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.

Goals: 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.

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

Quizzes: About 8 quizzes will be given in class. Most of them will be unannounced. The best 6 quiz scores will count towards the grades. Details will be explained in class.

Homework: Specific topics included in this course are attached. Homework assignments will be posted 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 about 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.

Gateway Test: In order to pass Math 112/112Z, the student must pass a Gateway exam. This exam is made up of eight problems as follows: two limits to evaluate (including using L'Hospital's Rule), two differentiation problems (any transcendental function may be included), and four integration problems (using any of the techniques such as u-substitution, trigonometric substitution, integration by parts, and 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

Major Tests: Three tests and a final exam will be given. All of the tests will be comprehensive. The final exam 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.

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

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

Tests (3 @ 100 points)	300 points
Gateway Test	100 points
Homework (6 @ 15 points)	90 points
Quizzes (6 @ 10 points)	60 points
Final Exam	200 points
TOTAL	750 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, most likely M-TH, 3-6 pm.

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.

Schedule of Topics (subject to adjustments)

24-Aug	Wednesday	Review Functions, Limits
26-Aug	Friday	Review Functions, Limits, Differentiation
29-Aug	Monday	L'Hopital's Rule
31-Aug	Wednesday	L'Hopital's Rule
2-Sep	Friday	L'Hopital's Rule
7-Sep	Wednesday	Graphing logarithmic and exponential functions
9-Sep	Friday	Review Integration
12-Sep	Monday	Integration by Parts
14-Sep	Wednesday	Review for Test 1
15-Sep	**Thursday**	**Test 1, 7:45 AM – 9:30 AM**
16-Sep	Friday	Integrals with Trig Functions
19-Sep	Monday	Trigonometric Substitution
21-Sep	Wednesday	Partial Fractions
23-Sep	Friday	Partial Fractions
26-Sep	Monday	Improper Integrals
28-Sep	Wednesday	Improper Integrals
29-Sep	**Thursday**	**Gateway Test 1, 8:30 AM – 9:30 AM**
30-Sep	Friday	Review for Test 2
3-Oct	Monday	Infinite Sequences
4-Oct	**Tuesday**	**Test 2, 7:45 AM – 9:30 AM**
5-Oct	Wednesday	Infinite Series
7-Oct	Friday	Infinite Series
12-Oct	Wednesday	n-th Term Test and Integral test
14-Oct	Friday	Integral test and p-series
17-Oct	Monday	Integral test and p-series
19-Oct	Wednesday	Comparisons of Series
20-Oct	**Thursday**	**Gateway Test 2, 8:30 AM – 9:30 AM**
21-Oct	Friday	Alternating Series
24-Oct	Monday	Ratio and Root Test
31-Oct	Monday	Review Infinite Series
2-Nov	Wednesday	Power Series
4-Nov	Friday	Power Series
7-Nov	Monday	Review for Test 3
8-Nov	**Tuesday**	**Test 3, 7:45 AM – 9:30 AM**
9-Nov	Wednesday	Power Series
11-Nov	Friday	Power Series
14-Nov	Monday	Taylor and Maclaurin Series
16-Nov	Wednesday	Taylor and Maclaurin Series
18-Nov	Friday	Review Power Series
21-Nov	Monday	Polar Coordinates
28-Nov	Monday	Polar Coordinates
29-Nov	**Tuesday**	**Gateway Test 3, 8:30 AM – 9:30 AM – Last Chance!**
30-Nov	Wednesday	Polar Coordinates
2-Dec	Friday	Review graphing and area in polar coordinates
5-Dec	Monday	Last Day, Evaluations, Discuss Final Exam

On Homework

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All the homework will be posted in the **Homework** section in **Blackboard**. After the lectures, you should review the class notes and textbook before doing the homework.

You should always start the problems on your own. If you run into difficulties, you may discuss with another student or a tutor. If there are questions that a group of you cannot solve, you may ask me outside class or email me. Depending on the questions, I might choose to discuss some of them in class. You should always write down your solutions individually.

Grading of the Homework:

Homework is due in class. *Put all the problems in order and staple the sheets together. Make sure that you have your name on the Homework.* You should complete all the homework and bring it to class on the due date. Randomly selected students will be asked to hand in their homework. In general, no late homework will be accepted unless there is a legitimate excuse, in which case the student should contact the professor as soon as possible.

Each homework is worth 15 points. You do not have to complete all the problems correctly in order to receive 15 points. As long as you have tried every single problem, and correctly completed most of them, you will receive $12-15$ points. If the homework is particularly shabby or a large number of problems are missing, you might get 7 points or under. Most of the time I will check about 1/3 of the problems carefully and skim the rest.

Solutions to Homework Problems:

There will be several copies of Solution Manuals on reserve in the library (ask the librarians for them). You should NOT copy solutions from the manual. It serves you no good if you do that. After the completion of the homework, you may consult the manual for the answers. For odd-numbered questions, your textbook has answers at the back. You should check the solutions after the homework has been graded and handed back. After I have taken a look at your homework, I might choose to discuss some problems in class. You can always let me know if you need me to provide the solutions to any specific problems.

Remember that the goal for doing homework regularly is to help you practice and understand the material. Homework only counts 90 points towards the total number of points. The majority of your grade will be decided by how well you have mastered the material. Homework is assigned to serve that end.

Let me know if you have any questions.

A Note to Serious Calculus Students[1]

1. **How much to study:** Calculus, to some, is a hard subject. It may be your most challenging course this semester. You should spend around 10 hours a week studying calculus, even if you have "seen it before." Don't assume you know the material! Extra time is needed to review for tests. If you cannot make this level of time commitment this semester you will likely be better off taking calculus at another time.

2. **How to study:** Students often find calculus texts hard to read. They are not to be read like a novel, or a history or even a biology text. Your text is a reference book and should be read in a series of passes. The first pass through a section, done **before** the class for which the topics will be studied, you should skim through it lightly, reading definitions and theorems, and trying to **work** through some of the examples. After class, re-read the text, your notes and other handouts. Don't expect to understand fully what you've read until you start working on the exercises. In fact, you should spend most of your study time working problems, thinking about those problems, and discussing problems. As you get stuck, go back, rereading the text or your notes or other handouts, studying the examples and derivations, on a "need-to-know" basis.

3. **Homework:** Work lots and lots of problems. When you finish the current section, you should go back and work review problems. Furthermore, you have not completed the homework just because you have the right answers, you must understand **why** and **how** your methods worked. If all you are doing is blindly applying formulas and mimicking examples, it means that you have not understood the material. You should get extra help. The problems should make logical sense to you. You must get to the point where you are able to work problems correctly, from start to finish, without having "to flip" back to the answer or to previous work. Time to reflect on your work helps build confidence and speed and enables you to retain the material.

4. **Studying for tests:** If you were an athlete preparing for track meet, and you slacked off during the weeks before the meet, doing just what you needed so coach wouldn't get on your case, and then stayed up running the whole night before your meet, you'd loose. Many students prepare for tests by cramming; they procrastinate and then believe that they can "stuff in" what they need for success by staying up all night attempting to study. Your brain will not to be in top shape by marathon studying. The right way to study is to do your work at a steady pace throughout the semester. There are a few facts and formulas you'll need to remember for a test. Make note cards for those facts and formulas and "touch base" with them often. In order to think well, you need to rest sufficiently and exercise adequately. Remember that aerobic exercise circulates blood to the body and that includes the brain.

5. **Come to class and use your outside help:** Many college students treat class attendance as optional. If you do that in calculus classes, you can get way behind very fast. You should come to class every period unless you are seriously ill. Schedule at least one SI session per week. Stop by and see your instructor during office hours or visit Mathematics Center to ask pertinent questions. Take charge of your learning!

6. **Ask questions.** Asking questions is a sign of maturity, not ignorance, as long as the student thinks carefully before asking.

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[1] Compiled by Dr. Evelyn C. Bailey, modified for Math112/Math112Z students.

7. **About grading.** Understand that the instructor is not trying to "nit pick" when grading and remember that grading is the responsibility of the instructor. Accuracy is important in this class!

Organizational Guidelines for College Students:

(1) As soon as you get your syllabi from your courses, put all important dates on a single calendar, clearly labeled.

(2) Stay current in your subjects by setting aside 8 to 10 hours per week to study each subject. You may need more time in some subjects. Spread your per-subject time out over the week. Marathon studying, especially in mathematics, does not work well! So, make a schedule and keep to it! Be flexible enough to make changes in your schedule.

(3) Plan ahead so that you get enough sleep before a test or you will not be able to think clearly and logically.

(4) Take advantage of the available outside help for each of your courses. Schedule at least one SI session per week for this course.

(5) Plan ahead for all your papers and projects so that studying for tests is not compromised. Create and schedule mini-goals to attain the major goal of completion on time.

(6) Have needed supplies for each course. Make sure you get copies of the Blackboard handouts PRIOR to the topic for which they are needed.

(7) Follow each syllabus carefully. For Math 112/112Z, a tentative schedule of topics is in your syllabus. Reading the section before coming to class will help your understanding.

(8) For Math112/112Z, read the Blackboard promptly for outlines and announcements.