Math 110
Oxford College of Emory University
Fall 2014

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Course Description: Mathematics 110 provides students with an integrative approach to Calculus I that includes the necessary precalculus topics.

- **Content:** Review of algebra; functions; trigonometric, inverse trigonometric, logarithmic, and exponential functions. Calculus topics include limits, continuity, the definition of the derivative, differentiation, extrema, antiderivatives, optimization problems.

Textbook: James Stewart, *Single Variable Calculus: Early transcendentals, 7th Edition*. Try to read the book before coming to class: believe me, this is a very useful habit.

Course Goals: Upon successful completion of Math 110 students will:

1. Be able to perform complex algebraic manipulations.
2. Be able to graph and compute with algebraic and transcendental functions.
3. Understand conceptually limits and their relationship to the graph of a function.
4. Understand conceptually the derivative and its relationship to the concept of "rate of change".
5. Be able to calculate derivatives and evaluate limits.
6. Be well-prepared for Math 111.

Classes: 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. In addition to the regular class meetings, there will also be several tests scheduled on Tuesday or Thursday mornings.

Homework: A homework is assigned almost every day of class at the end of class. These exercises usually will not be collected but are for the benefit of the student. Students may ask questions, and quizzes based on the homework may be given. The instructor may ask to see a student's homework.

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. Sleeping is important prior to tests.

Quizzes: (100 points) In-class quizzes will be given and most of them will be unannounced. The student must be present in class to take each quiz. There will be 12 quizzes of which the highest 10 will be counted. Normally an excused absence during which a student misses a quiz may not be made up.

Gateway Exams: (100 points) In order to pass this course the student must pass an examination in algebra, graphs and transcendental (trigonometric, logarithmic and exponential) functions. The student will be allowed three opportunities to pass it. Each test will be different but very similar to the original test. See the calendar for the schedule.

8:00 am	**Thursday, October 23**
8:00 am	**Tuesday, November 4**
8:00 am	**Tuesday, November 25**

Projects: (100 points) A few group projects will be assigned during the semester. The groups will consist of two or three people.

Tests: (400 points) Four major tests will be given. All of the tests will be comprehensive. Calculators will **not** be allowed on tests. Each student is expected to take tests at the scheduled times. Any conflicts, problems or emergencies 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. Documented special accommodations for test-taking must be cleared several days prior to the test date so that appropriate arrangements can be made.

The tests will be given on the following days:

- **8:00 am, Thursday, September 25 - Test 1**
- **8:00 am, Thursday, October 16 - Test 2**
- **8:00 am, Thursday, November 13 - Test 3**
- **8:00 am, Thursday, December 4 - Test 4**

Final Exam: (200 points) A cumulative final exam will be given at the time scheduled by the Registrar.

Grading: Evaluation will be based on the following written work:

Gateway Exams	100 points
Tests (4 @ 400 pts)	400 points
Quizzes	100 points
Projects	100 points
Final	200 points
Total	900 points

The plus/minus system will be used with the following rough guide to letter grades:

A	B	C	D	F
91% and above	81% to 90 %	71% to 80 %	61% to 70 %	below 60%

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`. Homework assignments, extra handouts, announcements, scheduled SI sessions, questions related to problems, and other material can be posted at any time. Students are responsible for checking the site every day and obtaining related information.

Written Style: Thoughts are expressed by sentences: just so in mathematics. Pay attention to your textbook: it is written in sentences. Your written work must be in complete sentences. Note "1+1 = 2" is a complete sentence (it has a subject "1+1", verb "=" and predicate "2"). Use mathematical symbols wherever appropriate. Your work also needs to be neat and orderly to be intelligible. See the "Calculus Style Guide" on Blackboard.

Tips for Success: Calculus is hard, but it can be made easier by intelligent and efficient study habits. Gauss said the purpose of calculation is insight. Insight is an understanding into why things work the way they do. This should be the goal of working out problems. Know **why** each step is correct and **why** each

step was the right step to take. This is more than knowing **that** each step is correct.

Although the homework exercises are not graded, it is important for the success of the student that they be completed as soon after covering the material as possible. Calculators may be used when appropriate, but the student should keep in mind that they are not permitted on the tests. While collaboration is encouraged, each student should be sure that he or she ultimately can **solve problems unaided by notes, the textbook, a calculator, or other people**.

Practice good style on homework. A clean style helps to clean up messy thinking.

In general the student will need to study at least six good hours per week exclusive of the time spent on case studies and review for tests.

Tests are performances, similar to those by athletes, musicians, and dancers. Prepare for them in similar ways. Begin practicing for them weeks in advance.

The topics we will cover are very useful and fundamental in the sciences, business and engineering, among other fields, and I want you all to succeed. However, success in the course will require your diligence and hard work. Be sure to keep up with the assignments and to attend class. Talk to your instructor as soon as you are having problems - don't wait until the week of a test. In addition to learning quantitative skills, it is important that you develop learning skills and study habits that will help you in calculus, in other courses, and in life beyond Oxford College.

Supplemental Instruction/Help Sessions/Tutoring/Study groups: The supplemental instruction (SI) leaders will be announced. They schedule study sessions to review calculus concepts, to help students dis- cover how best to study calculus. The SI leader is a student who has taken the course (or a similar course) before, has a good understanding of the material (but probably not as complete as the instructor), and knows how to be a successful student. Check the Blackboard for scheduled sessions.

Help sessions will be scheduled as there is demand for them. Attendance is optional.

Contact Mr. Paul Oser, Director of the Mathematics Center for tutoring hours, most likely Mondays through Thursdays, 3 – 6 pm.

Study groups, organized by students are highly recommended.

You may always ask the instructor any question about an assignment. He will answer at his discretion.

Good luck and I hope this will be an enjoyable experience for all of you!

Honor Code: The Honor Code of Oxford College applies to all work submitted for credit in this course. To receive credit for work submitted you must place your name on it. By placing your name on such work, you pledge that the work has been done in accordance with the given instructions and that you have witnessed no Honor Code violations in the conduct of the assignment.

Student work submitted as part of this course may be reviewed by Oxford College and Emory College faculty and staff for the purposes of improving instruction and enhancing Emory education.

Tentative Calendar:

Monday	Tuesday	Wednesday	Thursday	Friday
Aug 25th	Aug 26th	Aug 27th **1** §APC[1] Introduction: Optimization and calculus	Aug 28th	Aug 29th **2** §"Handout A"[2] Algebra Review
Sep 1st *No class* *Labor day holiday*	Sep 2nd	Sep 3rd **3** §1.2 Quadratic, polynomial and rational functions	Sep 4th	Sep 5th **4** §1.1 Piecewise defined functions
Sep 8th **5** §1.3 Combining functions	Sep 9th	Sep 10th **6** §1.6 Inverse functions	Sep 11th	Sep 12th **7** § NTF[3] A Trigonometric Functions: definition and basic graphs
Sep 15th **8** §NTF B Trigonometric Functions: identities	Sep 16th	Sep 17th **9** §NTF C Trigonometric Functions: graphs	Sep 18th	Sep 19th **10** §NTF D Trigonometric Functions: equations
Sep 22nd **11** §NTF E Inverse trigonometric functions	Sep 23rd	Sep 24th **12** REVIEW	Sep 25th **8:00** **Test 1**	Sep 26th **13** §2.2 The limit of a function
Sep 29th **14** §2.3 Calculating limits	Sep 30th	Oct 1st **15** §2.2 Infinite limits	Oct 2nd	Oct 3rd **16** §2.5 Continuity
Oct 6th **17** §2.5 Continuity	Oct 7th	Oct 8th **18** §NTF F Exponential and logarithmic functions	Oct 9th	Oct 10th **19** §NTF G Exponential and logarithmic equations

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[1]See section "A preview of Calculus" in the textbook.

[2]See Handout on Algebra on Blackboard

[3]See "Notes on Transcendental functions" on Blackboard.

Monday	Tuesday	Wednesday	Thursday	Friday
Oct 13th *Midsemester Break*	Oct 14th *Midsemester Break*	Oct 15th **20** REVIEW	Oct 16th **8:00** **Test 2**	Oct 17th **21** Last day for dropping. §Notes Binomial Theorem
Oct 20th **22** §2.6 Limits at infinity	Oct 21st	Oct 22nd **23** §2.7 Derivative	Oct 23rd **8:00** **Gateway Exam** **First** **opportunity**	Oct 24th **24** §2.8 Derivative as a function
Oct 27th **25** §3.1 Derivative of polynomials and exponential Functions	Oct 28th	Oct 29th **26** §3.2 The product and quotient rules	Oct 30th	Oct 31st **27** §3.3 Derivatives of trigonometric functions
Nov 3rd **28** §3.4 The chain Rule	Nov 4th **8:00** **Gateway Exam** **Second** **opportunity**	Nov 5th **29** §3.6 Derivative of logarithmic functions	Nov 6th	Nov 7th **30** Working with derivatives
Nov 10th **31** §4.1 Maximum and minimum values	Nov 11th	Nov 12th **32** REVIEW	Nov 13th **8:00** **Test 3**	Nov 14th **33** §4.3 Increasing & Decreasing test
Nov 17th **34** §4.7 Optimization problems	Nov 18th	Nov 19th **35** §4.9 Antiderivatives	Nov 20th	Nov 21st **36** §5.5 (1st part) Antiderivatives
Nov 24th **37** §5.5 (1st part) Antiderivatives	Nov 25th **8:00** **Gateway Exam** **Last** **opportunity**	Nov 26th *Thanksgiving recess*	Nov 27th *Thanksgiving recess*	Nov 28th *Thanksgiving recess*
Dec 1st **38** §Notes Sigma notation	Dec 2nd	Dec 3rd **39** REVIEW	Dec 4th **8:00** **Test 4**	Dec 5th **40** Review limits
Dec 8th **41** Review Differentiation	Dec 9th *Last day of classes*	Dec 10th *Reading Day*	Dec 11th	Dec 12th **42**