

Math 110A
Oxford College of Emory University
Fall 2012

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Course Content: Mathematics 110A provides students with an integrative approach to Calculus I that includes the necessary precalculus topics: Review of algebra; functions; trigonometric, inverse trigonometric, logarithmic and exponential functions. Calculus topics include limits, continuity, the definition of the derivative, differentiation, extrema, the Intermediate Value Theorem, antiderivatives and optimization problems.

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

Course Goals: Upon successful completion of Math 110A 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 and 119.

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: Homework is assigned almost every day 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. Sleep is important prior to tests.

Quizzes: 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.

Gateway Exams: In order to pass this course the student must pass an examination in algebra, graphs and transcendental (trigonometric, logarithmic and exponential) functions.

See the calendar for the schedule. The student will be allowed three opportunities to pass it. Each test will be different but very similar to the original test.

- 8:00 am Thursday, October 25
- 8:00 am Thursday, November 1
- 8:00 am Thursday, November 29

Projects: Two group projects will be assigned during the semester. Students will work in groups of two or three people.

Tests: 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 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.

The tests will be given on the following days:

- 8:00 am, Tuesday, September 25 - Test 1
- 8:00 am, Thursday, October 18 - Test 2
- 8:00 am, Thursday, November 15 - Test 3
- 8:00 am, Thursday, December 6 - Test 4

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

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

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

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 discover how best to study calculus. The SI 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.

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 projects 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 we 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 instructors 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.

You may always ask the instructors any question about an assignment. They will answer at their discretion.

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

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.

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.

Tentative Calendar:

Monday	Tuesday	Wednesday	Thursday	Friday
Aug 27th	Aug 28th	Aug 29th <u>1</u> <u>§APC¹</u> Introduction: Optimization and calculus	Aug 30th	Aug 31st <u>2</u> <u>§“Handout A”²</u> Algebra Review
Sep 3rd <i>No class Labor day holiday</i>	Sep 4th	Sep 5th <u>3</u> <u>§1.2</u> Quadratic, polynomial and rational functions	Sep 6th	Sep 7th <u>4</u> <u>§1.1</u> Piecewise defined functions
Sep 10th <u>5</u> <u>§1.3</u> Combining functions	Sep 11th	Sep 12th <u>6</u> <u>§ NTF³ A</u> Trigonometric Functions: definition and basic graphs	Sep 13th	Sep 14th <u>7</u> <u>§NTF B</u> Trigonometric Functions: identities
Sep 17th <u>8</u> <u>§NTF C</u> Trigonometric Functions: graphs	Sep 18th	Sep 19th <u>9</u> <u>§NTF D</u> Trigonometric Functions: equations	Sep 20th	Sep 21st <u>10</u> <u>§Notes</u> Binomial Theorem
Sep 24th <u>11</u> REVIEW	Sep 25th Test 1	Sep 26th <u>12</u> <u>§2.2</u> The limit of a function	Sep 27th	Sep 28th <u>13</u> <u>§2.3</u> Calculating limits
Oct 1st <u>14</u> <u>§2.2</u> Infinite limits	Oct 2nd	Oct 3rd <u>15</u> <u>§2.5</u> Continuity	Oct 4th	Oct 5th <u>16</u> <u>§2.5</u> Continuity
Oct 8th <u>17</u> <u>§NTF F</u> Exponential and logarithmic functions	Oct 9th	Oct 10th <u>18</u> <u>§NTF G</u> Exponential and logarithmic equations	Oct 11th	Oct 12th <u>19</u> Review of Trigonometry

¹See section “A preview of Calculus” in the textbook.

²See Handout on Algebra on Blackboard

³See “Notes on Transcendental functions” on Blackboard.

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

Monday	Tuesday	Wednesday	Thursday	Friday
Dec 10th <u>41</u> Review Differentiation	Dec 11th <i>Last day of classes</i>	Dec 12th <i>Reading Day</i>	Dec 13th	Dec 14th