

Math 110
Oxford College of Emory University
Spring 2015

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Office Hours: Will be announced in Blackboard every week.

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	Tuesday, March 17
8:00 am	Tuesday, April 2
8:00 am	Tuesday, April 16

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, February 12 - Test 1
- 8:00 am, Tuesday, March 3 - Test 2
- 8:00 am, Tuesday, March 31 - Test 3
- 8:00 am, Tuesday, April 23 - 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 discover 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
Jan 12th	Jan 13th	Jan 14th <u>1</u> §APC ¹ Introduction: Optimization and calculus	Jan 15th	Jan 16th <u>2</u> §“Handout A” ² Algebra Review
Jan 19th <i>No class Martin Luther King day holiday</i>	Jan 20th	Jan 21st <u>3</u> §1.2 Quadratic, polynomial and rational functions	Jan 22nd	Jan 23rd <u>4</u> §1.1 Picccewise defined functions
Jan 26th <u>5</u> §1.3 Combining functions	Jan 27th	Jan 28th <u>6</u> §1.6 Inverse functions	Jan 29th	Jan 30th <u>7</u> § NTF ³ A Trigonometric Functions: definition and basic graphs
Feb 2nd <u>8</u> §NTF B Trigonometric Functions: identities	Feb 3rd	Feb 4th <u>9</u> §NTF C Trigonometric Functions: graphs	Feb 5th	Feb 6th <u>10</u> §NTF D Trigonometric Functions: equations
Feb 9th <u>11</u> §NTF E Inverse trigonometric functions	Feb 10th	Feb 11th <u>12</u> REVIEW	Feb 12th	Feb 13th <u>13</u> §2.2 The limit of a function
Feb 16th <u>14</u> §2.3 Calculating limits	Feb 17th	Feb 18th <u>15</u> §2.2 Infinite limits	Feb 19th	Feb 20th <u>16</u> §2.5 Continuity
Feb 23rd <u>17</u> §2.5 Continuity	Feb 24th	Feb 25th <u>18</u> §NTF F Exponential and logarithmic functions	Feb 26th	Feb 27th <u>19</u> §NTF G Exponential and logarithmic equations

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
Mar 2nd <u>20</u> REVIEW	Mar 3rd	Mar 4th <u>21</u> §Notes Binomial Theorem	Mar 5th	Mar 6th <u>22</u> §2.6 Limits at infinity
Mar 9th <i>Spring Break</i>	Mar 10th <i>Spring Break</i>	Mar 11th <i>Spring Break</i>	Mar 12th <i>Spring Break</i>	Mar 13th <i>Spring Break</i>
Mar 16th <u>23</u> §2.7 Derivative	Mar 17th	Mar 18th <u>24</u> §2.8 Derivative as a function	Mar 19th	Mar 20th <u>25</u> §3.1 Derivative of polynomials and exponential Functions
Mar 23rd <u>26</u> §3.2 The product and quotient rules	Mar 24th	Mar 25th <u>27</u> §3.3 Derivatives of trigonometric functions	Mar 26th	Mar 27th <u>28</u> §3.4 The chain Rule
Mar 30th <u>29</u> §3.6 Derivative of logarithmic functions	Mar 31st	Apr 1st <u>30</u> Working with derivatives	Apr 2nd	Apr 3rd <u>31</u> §4.1 Maximum and minimum values
Apr 6th <u>32</u> REVIEW	Apr 7th	Apr 8th <u>33</u> §4.3 Increasing & Decreasing test	Apr 9th	Apr 10th <u>34</u> §4.7 Optimization problems
Apr 13th <u>35</u> §4.9 Antiderivatives	Apr 14th	Apr 15th <u>36</u> §5.5 (1st part) Antiderivatives	Apr 16th	Apr 17th <u>37</u> §5.5 (1st part) Antiderivatives
Apr 20th <u>38</u> §Notes Sigma notation	Apr 21st	Apr 22nd <u>39</u> REVIEW	Apr 23rd	Apr 24th <u>40</u> Review limits
Apr 27th <i>Last day of classes</i>	Apr 28th <i>Reading Day</i>	Apr 29th	Apr 30th	May 1st <u>41</u>