Math 119 - Business Calculus
Oxford College of Emory University
Spring 2011

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Course Description: Mathematics 119 covers topics from Calculus with an emphasis on applications to and examples from Business and Economics. Topics covered include: functions, limits, continuity, the derivative, product and quotient rules, the chain rule, marginal analysis and approximations, curve sketching, maxima/minima problems, exponential and logarithm functions, derivatives of exponential and logarithmic functions, integration and applications, trigonometric functions, derivatives and integrals of trigonometric functions.

Mathematics 119 is a beginning course. No prior exposure to calculus is needed! A good solid background in pre-calculus (algebra, logarithms and exponents, and trigonometry) is extremely important.

Textbook: Laurence D. Hoffmann & Gerald L. Bradley, *Applied Calculus for Business, Economics, and the Social and Life Sciences, Expanded Edition, McGraw Hill, Tenth 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 119 students will:

1. Understand conceptually limits and their relationship to the graph of a function.
2. Understand conceptually the derivative and its relationship to the concept of "rate of change".
3. Understand conceptually the definite integral and its relationship to area and volume.
4. Be able to calculate derivatives, evaluate limits, and compute integrals (both definite and indefinite).
5. Be able to apply the notions of calculus to problems in business and economics.
6. Be well-prepared for Math 112.

Classes: The student is responsible for what is covered in class. In addition to the regular class meetings, there will also be several tests scheduled on Tuesday or Thursday mornings. (See below).

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.

Quizzes: (100 points.) All quizzes may be announced and are usually in-class. The student must be present in class to take each quiz. Up to one quarter of the quizzes will be dropped. Each quiz will count the same amount, the average per cent being used to calculate the number of points. For example, a 94% quiz average at the end of the course will result in 94 points out of the 100. Normally an excused absence during which a student misses a quiz may not be made up; it will be dropped.

Gateway Exams: (50 points.) In order to pass the course, the student must pass an examination on differentiation. All 50 points will be given for a perfect paper. If the student has one mistakes or less, the student passes the Gateway and receives a score of 30 points for one mistake. The student will be allowed three opportunities to pass it and an extra 10 points will be given to those with a perfect score in the first try. Each test will be different but very similar to the original test.

8:00 am	**Thursday, February 24th**
8:00 am	**Thursday, March 24th**
8:00 am	**Thursday, April 14th**

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

Tests: (330 points.) In general, calculators will not be allowed on tests. Three tests will be given on the following days:

- **8:00 am, Thursday, February 10th - Test 1 (110 points)**
- **8:00 am, Thursday, March 17th - Test 2 (110 points)**
- **8:00 am, Thursday, April 21st - Test 3 (110 points)**

Final Exam: (250 points.) A cumulative final exam will be given at the time scheduled by the Registrar.

Excuses: Excuses deemed legitimate by the instructor will be handled according to the individual circumstances and college policies.

The student is expected to take all tests and exams at the scheduled times. For legitimate excuses arrangements will be made to take a test prior to the testing time. There will be no make-up tests given after the testing time.

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.

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

Gateway Exams	50 points
Tests (3 @ 110 pts)	330 points
Quizzes	100 points
Projects	70 points
Final	250 points
Total	800 points

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

A	B	C	D	F
720 points and up	640 - 719 points	560 - 639 points	480 - 559 points	below 480

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 me 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.

SI/Help Sessions/Tutoring: The SI program is a program of optional, organized study sessions. The sessions are not meant to be tutoring sessions. The supplemental instructor (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.

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

The schedule for tutoring in the Math Center will be announced when available.

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.

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!

Tentative Calendar:

Monday	Tuesday	Wednesday	Thursday	Friday
Jan 10th **1**	Jan 11th	Jan 12th **2** §1.1 - 1.4 Review of Functions & Mathematical Modeling	Jan 13th	Jan 14th **3** §4.1 Review of Exponential & logarithmic functions
Jan 17th *No class Martin Luther King Jr. holiday*	Jan 18th	Jan 19th **4** §1.5 Limits	Jan 20th	Jan 21st **5** §1.5 - 1.6 Limits & Continuity
Jan 24th **6** §1.6 Continuity & IVT	Jan 25th	Jan 26th **7** §2.1 Derivative Tangent Lines and velocity	Jan 27th	Jan 28th **8** §2.2 Derivative Rules
Jan 31st **9** §4.3, 11.2 Derivative Rules: Transcendental Functions	Feb 1st	Feb 2nd **10** §2.3 Product & Quotient Rules	Feb 3rd	Feb 4th **11** §2.4 Chain Rule
Feb 7th **12** §2.4 Chain Rule (cont.)	Feb 8th	Feb 9th **13** Review Test 1	Feb 10th **8:00 Test 1**	Feb 11th **14** §2.5 Application of derivatives: Marginal Analysis
Feb 14th **15** §2.6 Implicit Differentiation & Logarithmic differentiation	Feb 15th	Feb 16th **16** §2.6 Related Rates	Feb 17th	Feb 18th **17** §2.6 Related Rates (cont.)

Monday	Tuesday	Wednesday	Thursday	Friday
Feb 21st **18** §1.5 Infinite limits & Limits at infinity	Feb 22nd	Feb 23rd **19** §3.1 - 3.3 Curve Sketching: Increasing & decreasing functions	Feb 24th **8:00** **Gateway Exam** **First Try**	Feb 25th **20** §3.1 - 3.3 Curve Sketching: Concavity
Feb 28th **21** §3.1 - 3.3 Curve Sketching: Examples	Mar 1st	Mar 2nd **22** §3.1 - 3.3 Curve Sketching: Verical Tangents	Mar 3rd	Mar 4th **23** Last day for dropping. §4.2 Compound Interest
Mar 7th *Spring Break*	Mar 8th *Spring Break*	Mar 9th *Spring Break*	Mar 10th *Spring Break*	Mar 11th *Spring Break*
Mar 14th **24** §4.4 Exponential Models	Mar 15th	Mar 16th **25** Review Test 2	Mar 17th **8:00** **Test 2**	Mar 18th **26** §3.4 Optimization
Mar 21st **27** §3.5 Elasticity of Demand	Mar 22nd	Mar 23rd **28** §3.5 Max/Min Problems	Mar 24th **8:00** **Gateway Exam** **Second Try**	Mar 25th **29** §5.1 Antiderivatives
Mar 28th **30** §5.2 Substitution Rule	Mar 29th	Mar 30th **31** §5.2 Substitution Rule (cont.)	Mar 31st	Apr 1st **32** Sigma Notation & Mathematical Induction
Apr 4th **33** Mathematical Induction (cont.)	Apr 5th	Apr 6th **34** §5.3 Riemann Sums and Definite Integral	Apr 7th	Apr 8th **35** §5.3 Fundamental Theorem of Calculus
Apr 11th **36** §5.4 Applications of Definite Integrals: Area between curves	Apr 12th	Apr 13th **37** §5.5 Applications of Definite Integrals: Business & Economics	Apr 14th **8:00** **Gateway Exam** **Last Try**	Apr 15th **38** §5.6 Applications of Definite Integrals: Volume of revolution

Monday	Tuesday	Wednesday	Thursday	Friday
Apr 18th **39** §5.6 Applications of Definite Integrals: Volume of revolution (cont.)	Apr 19th	Apr 20th **40** Review Test 3	Apr 21st **8:00** **Test 3**	Apr 22nd **41** Final Review
Apr 25th **42** Final Review	Apr 26th *Last day of classes*	Apr 27th *Reading Day*	Apr 28th	Apr 29th