

MATH 111.01 — Calculus I

Syllabus and Course Procedures

Fall 2012

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Office Hrs
Mon 10-11
Tue 9-11
Wed 2-3
Fri 10-11

Text Materials Calculus (Early Transcendentals), by Briggs and Cochran, Pearson Education, Inc. (2011).

Course Material The following is an ordered section list. Some sections may be omitted or abbreviated to accommodate our tight time schedule, and some sections may not require written homework.

- 1.1 Review of Functions (selections)
- 1.2 Representing Functions (selections)
- 1.3 Inverse, Exponential, and Logarithmic Functions
- 1.4 Trigonometric Functions and Their Inverses,
- 2.1 The Idea of Limits
- 2.2 Definitions of Limits
- 2.3 Techniques for Computing Limits
- 2.4 Infinite Limits
- 2.5 Limits at Infinity
- 2.6 Continuity
- 3.1 Introducing the Derivative
- 3.5 Derivatives as Rates of Change (selections from)
- 3.2 Rules of Differentiation
- 3.3 The Product and Quotient Rules
- 3.4 Derivatives of Trigonometric Functions
- 3.6 The Chain Rule
- 3.8 Derivatives of Logarithmic and Exponential Functions
- 3.9 Derivatives of Inverse Trigonometric Functions
- 3.7 Implicit Differentiation (selections from)
- 3.10 Related Rates
- 4.1 Maxima and Minima
- 4.2 What Derivatives Tell Us
- 4.3 Graphing Functions
- 4.4 Optimization Problems
- 4.5 Linear Approximation and Differentials
- 4.6 Mean Value Theorem
- 4.7 L'Hopital's Rule
- 4.8 Antiderivatives
- 5.1 Approximating Areas Under Curves
- 5.2 Definite Integrals
- 5.3 Fundamental Theorem of Calculus
- 5.4 Working with Integrals
- 5.5 Substitution Rule
- 6.1 Velocity and Net Change
- 6.2 Regions Between Curves
- Differential Equations

Course Grade Your course grade will be determined using a weighted average* as follows:

Written Homework Assignments**	11 %	
On-line Homeworks	6 %	
In-class Quizzes**	10 %	
Mathematical Paper 1	8 %	
Mathematical Paper 2	8 %	
Midterm Exam 1	13 %	Wednesday, October 3 (2 hours)
Midterm Exam 2	13 %	Wednesday, November 14 (2 hours)
Gateway Exam	10 %	To Be Announced
Final Exam	21 %	Thursday, December 20, 8:30 - 11:30 am

* Grading scale is *approximately*: A (90-100), B (80-90), C (70-80), D (60-70), F (below 60)

** I will drop your lowest written homework and quiz scores before calculating your final course average

Written Homework Assignments Homework exercises will be assigned and collected frequently (typically at least one assignment per week.) The homework may involve computer exercises. You are encouraged to discuss problem concepts and solution techniques with your fellow students, but your final homework reports must be your own work. Homework solutions should be legible and presented in a logical fashion, with problem number clearly indicated. Messy work that is difficult to follow may receive no credit. Although this is a mathematics course, you should often accompany your mathematical work with explanations and ideas written in complete sentences. Your written homework will be graded by an upper level math student. I can't stress enough how important homework is to success in this course. Homework problems in our textbook range from simple to very difficult. Particularly, many text problems will seem harder than the problems you are used to from your high school courses, requiring more thought and less routine symbolic manipulation. The payback from hours of hard work on home assignments will be a deeper understanding of calculus and, ultimately, the likelihood of a high grade in the course.

On-line Homework Assignments You will complete several on-line homework assignments using MyMathLab, an internet-based homework system. It is my intention for these on-line assignments to be comprised of the more routine practice problems; problems of this type are most compatible with the multiple choice computerized format. We will discuss in class how to sign on to the MyMathLab system.

Quizzes (Exam Rehearsals) Students benefit from extra practice on solving problems in an exam setting. In-class quizzes are intended to provide such practice and give students feedback on how well they know the most important core topics of this course. If a student has a weakness in a particular area, better to find out on a quiz rather than an exam. There will be four to six in-class quizzes this semester. The in-class quizzes will usually be about 10 to 15 minutes long and will consist of one or two exam-like problems on core course topics.

Mathematical Software and Technology There will be a considerable amount of work done with the aid of the computer program Maple. Do not worry at all if you have never used Maple, as I assume no familiarity with Maple whatsoever; all that you need to know about the program will be covered in class. The Maple program is available for your use in Hayes 311, Peirce 009, and most other science quad network sites. *Also, as a calculus student, you can obtain a free copy of the Maple program for your laptop or dorm computer by visiting the office of Professor Klopčic, Rutherford B. Hayes Hall 101. Take advantage of this opportunity!* Proper maintenance of your files is your responsibility. You should also have a pocket calculator capable of handling computations with transcendental functions (the trigonometric functions, \ln , \log_{10} , exponential, square root, etc.).

Mathematical Papers You will write two mathematical papers in this course. Did he say mathematical papers? Yes — expressing your ideas in writing is important in any discipline, including mathematics. A mathematical paper usually entails a detailed exposition of some mathematical concept, problem, or in-class activity. More details will be provided per each individual assignment.

Midterm Exams There will be two midterm examinations. Each exam will consist of two parts — a *no technology part* and a *technology permitted part*. On the no technology portion of the exam, you may use only pencil and paper. For the technology permitted portion, you may use a calculator, Maple, and derivative tables.

Final Exam The final exam will be a three-hour exam covering the material for the entire course, however the focus of the final will be weighted more heavily on material from the second half of the semester. The format of the final exam will be very similar to that of the midterm exams, consisting of a *no technology part* and a *technology permitted part*.

The Differentiation Gateway Exam Calculus is a coherent set of ideas that describe change using mathematics. Although symbolic manipulation is not the central idea of the course, it is the language in which we describe mathematical ideas and a powerful set of tools that we use to answer questions that interest us. Essentially, symbolic representation and manipulations are the grammar rules that allow us to speak the language of calculus. It is imperative that you obtain sufficient facility with symbolic manipulation so that the manipulations themselves do not form a barrier between you and the ideas they represent.

The differentiation gateway exam is a purely computational exam, designed to make sure that you are obtaining the analytical (grammatical) skills that are required to do calculus. The gateway exam will be given after we have covered the essential rules of differentiation (approximately the 8th week of the semester), and will consist of seven problems that test your ability to apply these rules correctly. To pass the gateway exam, you must present flawless solutions to six of the seven problems on the exam. The gateway exam is worth 10% of your final course grade. Since perfect solutions are required, a reasonable number of retakes of the gateway exam are permitted according to the following guidelines.

- a. Retakes will be of similar format to the first gateway exam, but will consist of different problems.
- b. A student may take no more than 2 retakes per week, and may take at most 1 retake in any given day. No student may retake the gateway exam after 4 pm on the last day of classes.
- c. A student who passes the gateway exam on their first attempt will receive 120% on the exam (i.e. 1.2 times full credit).
- d. A student who passes a retake within two weeks after the gateway exam is first given will receive 100% on the exam (i.e. full credit).
- e. A student who passes a retake after more than two weeks have passed since the first gateway exam was given will receive 50% on the exam (i.e. half credit).
- f. A student who fails to pass the gateway exam on all attempts will receive 0% on the exam.

Late Policy All assignments must be turned in at the beginning of the class period on the assigned due date, unless specified otherwise by the instructor. No credit will be given to unexcused late papers. If you have a conflict due to illness or sports, e-mail me right away.

Academic Honesty Any work you submit for credit in this course must result directly from your own understanding, thoughts, and ideas. Presenting the work of others as your own is strictly prohibited.

Disabilities If you have any disability and therefore may have need for some type of accommodation in order to participate fully in this class, please feel free to discuss your concerns in private with Erin Salva, Coordinator of Disability Services (phone 5145).