Sample Syllabus for Calculus 1

Required Text(s)/Software/Tools
TBA

Course Prerequisites
Students enrolled in Calculus 1 are expected to have a strong basis in arithmetic and algebra.

Course Description

Mathematics Mission: The Mathematics Department is committed to ensuring that all students have the opportunity to effectively and confidently:
Read, write and speak mathematically,
Use the language, frameworks, and processes of mathematics in varied contexts,
Formulate and solve mathematical problems and interpret the results,
Use mathematical abstraction to articulate the mathematical relationship.

The Department wishes to create a coherent vision of what it means to be mathematically literate, both in the world that relies on calculators and computers to carry out mathematical procedures and in a world where mathematics is rapidly growing and is extensively being applied in diverse fields.

As students’ progress through the mathematics program, they will apply their growing knowledge of mathematics to increasingly complex problem situations that will stimulate a sense of inquiry and a love of learning. That knowledge should help students develop skills transferable to other disciplines and from the classroom to life experience, as they are encouraged to persist when solving problems, and in developing new mathematical skills and strategies to meet the challenges of their world.

Quantitative techniques have permeated almost all intellectual disciplines. However, the fundamental ideas needed in these areas are not necessarily those studied in the traditional mathematical sequence designed with engineering and physical science applications in mind. Because mathematics is a foundation discipline for other disciplines and grows in direct proportion to its utility, we believe that the curriculum for all students must provide opportunities to develop an understanding of mathematical models, structures, and simulations applicable to many disciplines.

Course Outcomes

Mathematics Course Outcomes: The outcomes mathematics courses are consistent with frameworks presented with other mathematics reform initiatives and are intended to affect all aspects of introductory college mathematics. The standards, as established by the National Council of Teachers of Mathematics, fall into the following categories: mathematics as problem solving, mathematics as communications, mathematics as reasoning, mathematical connections, algebra, functions, and mathematical procedures.
Course Methodology

Each week, you will be expected to:
1. Review the week's learning objectives.
2. Complete all assigned readings.
3. Complete all lecture materials for the week.
4. Participate in the Discussion Board.
5. Complete and submit all assignments and tests by the due dates.

Expectations
Students are expected to complete all the assigned work within the week it is assigned, to complete a Discussion Board forum, and to complete a TEST both given during each of the four weeks.

Contact the Instructor When You Have Problems
Be sure to identify the subject as Calculus 1050. Do not use the Water Cooler of any other form of communication on the course site to contact the instructor. You, of course may use the Discussion Board to respond to my comments.

Obtaining Tutors
Tutors are available without charge through the library.

Commitment to Quality Communication Skills
While the principal goal of this course is the acquisition of knowledge and skills in mathematics, students should be aware that University College requires that clear and effective writing an integral part of the learning process. In addition to the requirement by the College, the Mathematics Department believes that students who can communicate their knowledge have a true understanding of the subject matter. Students are required to use the appropriate terms when describing mathematical processes.

Use of Technology in Calculus 1
Faculty and students are expected to make use of appropriate technology. The TI84 or TI84+ calculator is required as part of this course.

Final Course Grade Criteria
Each student will be evaluated by the following criteria:

Four Tests: Each test will count 15 points towards your final grade. Students are required to demonstrate mastery of content and process during the course. The tests will include demonstration of both theoretical and computational principles.

Four Discussion Board forums: Each will count 10 points toward your final grade.
Discussion Board forums and Tests MUST be completed by the end of the week in which they are posted. No exceptions.

Incomplete Grades:
Incomplete grades (I) will be given only when the student fails to complete a single key requirement of the course. The incomplete grade will be changed upon completion of the deficiency. Students must file an “Incomplete Clearance Agreement” with the program office. Any student who wishes to clear an “I” which is outstanding for more than one year must petition the Academic Standing Committee for permission.

Calculus is the mathematics of change and motion. Where there is motion, growth, or where there are forces at work producing acceleration, Calculus is the mathematical tool. Calculus is used in space technology, to test theories in dynamics of the atmosphere, ocean currents and theories in the fields of economics, sociology, psychology, motion and acceleration problems in physics, and in the application to curve sketching and maxima and minima problems. We deal with the first branch of Calculus in Calculus 1; that is, the Differential Calculus, which involves finding the rate at which, a variable quantity is changing. The second branch of Calculus is known as the Integral Calculus. We will be dealing with finding a function when its rate of change is given. Thus, if we are given the velocity of a moving body at every instant of time, we might want to find the distance it has moved as a function of time. This is a typical problem which belongs to the domain of the Integral Calculus. It is further noted that much attention will be given to the underlying theory of the Calculus and its application, rather than simply in calculating derivatives and evaluating integrals.

Communication/Submission of Work
In the Assignments folder, click on the View/Complete Assignment link to view each assignment. Attach your completed assignments here and click Submit to turn them in to me. Once your assignment has been graded, you will be able to view the grade and feedback I have provided by clicking on Tools, View Grades from the Northeastern University Online Campus tab.

Class Schedule / Topical Outline: Please note that specific problem set assignments and test dates will be given in class and posted on Blackboard.

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Assignments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>A. To understand the meaning of a function and their graphs, and graph transformations.</td>
<td>See Blackboard. Chapter 1.</td>
</tr>
<tr>
<td>2</td>
<td>To understand the definition of Limit and to evaluate such limits.</td>
<td>See Blackboard.</td>
</tr>
<tr>
<td></td>
<td>To understand rates of change and the meaning of the slope of a curve.</td>
<td>Chapter 2 and Chapter 3</td>
</tr>
<tr>
<td></td>
<td>B. To understand the definition of the derivative as a limit and to evaluate such a limit.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>To find the equation of the tangent and secant lines to a curve</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Techniques for Finding Derivatives</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Derivatives of Products and Quotients</td>
<td></td>
</tr>
<tr>
<td></td>
<td>The Chain Rule</td>
<td></td>
</tr>
</tbody>
</table>

| 3 | Derivatives of Exponential Functions |
|   | Derivatives of logarithmic Functions |
|   | C. To develop and use formulas for the derivatives of power forms, constants, sums, products, quotients, exponential, logarithmic and trigonometric functions. |
|   | To understand the meaning of composite functions |
|   | Implicit Differentiation |
Academic Integrity Policy

The University views academic dishonesty as one of the most serious offenses that a student can commit while in college and imposes appropriate punitive sanctions on violators. Here are some examples of academic dishonesty. While this is not an all-inclusive list, we hope this will help you to understand some of the things instructors look for. The following is excerpted from the University’s policy on academic integrity; the complete policy is available in the Student Handbook. The Student Handbook is available on the CPS Student Resources page > Policies and Forms.

- **Cheating** – intentionally using or attempting to use unauthorized materials, information or study aids in an academic exercise

- **Fabrication** – intentional and unauthorized falsification, misrepresentation, or invention of any data, or citation in an academic exercise

- **Plagiarism** – intentionally representing the words, ideas, or data of another as one’s own in
  - any academic exercise without providing proper citation

- **Unauthorized collaboration** – instances when students submit individual academic works that are substantially similar to one another; while several students may have the same source material, the analysis, interpretation, and reporting of the data must be each individual’s independent work.

- **Participation in academically dishonest activities** – any action taken by a student with the intent of gaining an unfair advantage

- **Facilitating academic dishonesty** – intentionally or knowingly helping or attempting to violate any provision of this policy

For more information on Academic Integrity, including examples, please refer to the Student Handbook, pages 9-11.
Northeastern University

Northeastern University Online Policies and Procedures
For comprehensive information please go to http://www.cps.neu.edu/online/

Northeastern University Online Copyright Statement
Northeastern University Online is a registered trademark of Northeastern University.

All other brand and product names are trademarks or registered trademarks of their respective companies.

This course material is copyrighted and all rights are reserved by Northeastern University Online. No part of this publication may be reproduced, transmitted, transcribed, stored in a retrieval system, or translated into any language or computer language, in any form or by any means, electronic, mechanical, magnetic, optical, chemical, manual, or otherwise, without the express prior written permission of Northeastern University Online.

Copyright 2014 © by Northeastern University Online
All Rights Reserved