# *Calculus Syllabus*

**Course Information**
Calculus, 2011-2012: M-F 9:00am

**Instructor Contact Information**
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Contact hours: 8:00am-10:00pm, Monday through Saturday

**Course Pre-requisites, Co-requisites, and/or Other Restrictions**
Precalculus

**Course Description**
Calculus is a study of rates of change between measurable quantities (i.e., variables). It is a skill set developed to answer real-world problems, and accordingly it has a staggering number of applications in a wide range of scientific disciplines. A strong appreciations of functions and their graphs will be needed for a clear understanding of the concepts presented.

**Student Learning Objectives/Outcomes**
The student will learn to differentiate and integrate a variety of functions; to identify graphical representations of these concepts; and to apply the skills learned to real-world problem solving.

**Required Textbooks and Materials**
- Calculus; 6th ed., Larson et. al.; Houghton/Mifflin
- A graphing calculator, TI-83 and up preferred; other models are permissible, but the student will be responsible for learning how to use it
- Quad rule graph paper (200 sheets)
- Straight edge
- 2 pencils with erasers

**Suggested Course Materials**
None

## Assignments & Academic Calendar

The schedule below is tentative and will be adjusted based on unexpected difficulty with concepts and external changes to the schedule (i.e., field trips for other classes). About 10 class periods have been built in for each semester in order to accommodate these changes.

| Week of | Topics / Sections in Text |
|---|---|
| 8/15/2011 | Introduction to course; graphs and models / P.1 |
| 8/22/2011 | linear models, functions, modeling data / P.2-P.4 |
| 8/29/2011 | Chapter P Exam, introduction to calculus, graphical and numerical limits / 1.1-1.2 |
| 9/5/2011 | Analytical limits, continuity / 1.3-1.4 |
| 9/12/2011 | Infinite limits, Chapter 1 Exam, derivatives / 1.5,2.1 |
| 9/19/2011 | Differentiation rules, product/quotient rules / 2.2-2.3 |
| 9/26/2011 | Chain rule, implicit differentiation / 2.4-2.5 |
| 10/3/2011 | Related rates, Chapter 2 Exam, extrema / 2.6,3.1 |
| 10/10/2011 | Mean value theorem, first derivative test, second derivative test / 3.2-3.4 |
| 10/17/2011 | Limits at infinity / 3.5 |
| 10/24/2011 | Curve sketching, optimization problems / 3.6-3.7 |
| 10/31/2011 | FIELD TRIP WEEK |
| 11/7/2011 | Newton's Method, differentials, business applications / 3.8-3.10 |
| 11/14/2011 | Chapter 3 Exam, antiderivatives, area / 4.1-4.2 |
| 11/21/2011 | Riemann sums / 4.3 |
| 11/28/2011 | Fundamental Theorem of Calculus, integration by substitution, numerical integration / 4.4-4.6 |
| 12/5/2011 | Chapter 4 Exam / BUILT-IN EXTRA DAYS |
| 12/12/2011 | BUILT-IN EXTRA DAYS |
| 1/2/2012 | Natural logarithm: differentiation and integration / 5.1-5.2 |
| 1/9/2012 | Inverse functions.exponential functions, bases other than e / 5.3-5.5 |
| 1/16/2012 | Differential equations: growth and decay, separation of variables / 5.6-5.7 |
| 1/23/2012 | Inverse trig functions: differentiation and integration, hyperbolic functions / 5.8-5.10 |
| 1/30/2012 | Chapter 5 Exam, area between two curves, disk method / 6.1-6.2 |
| 2/6/2012 | Shell method, arc length and surface area, work / 6.3-6.5 |
| 2/13/2012 | Moments and center of mass, fluid pressure and force / 6.6-6.7 |
| 2/20/2012 | Chapter 6 Exam, basic integration rules, integration by parts / 7.1-7.2 |
| 2/27/2012 | Trigonometric integrals, trigonometric substitution, partial fractions / 7.3-7.5 |
| 3/5/2012 | Integration by tables, L'Hopital's Rule, improper integrals / 7.6-7.8 |
| 3/12/2012 | Chapter 7 Exam, sequences, series / 8.1-8.2 |
| 3/19/2012 | Integral test, comparisons of series / 8.3-8.4 |
| 3/26/2012 | Alternating series / 8.5 |
| 4/2/2012 | SPRING BREAK |
| 4/9/2012 | Ratio and root tests, Taylor polynomials, power series / 8.6-8.8 |
| 4/16/2012 | Representation of functions by power series, Taylor series, Chapter 8 Exam / 8.9-8.10 |
| 4/23/2012 | Conics, plane curves / 9.1-9.2 |
| 4/30/2012 | Parametric equations, polar coordinates, polar area and arc length / 9.3-9.5 |
| 5/7/2012 | Polar equations, Chapter 9 Exam, BUILT-IN EXTRA DAYS |
| 5/14/2012 | BUILT-IN EXTRA DAYS |
| 5/21/2012 | BUILT-IN EXTRA DAYS |

## Grading Policy

The student's grade will have 4 components:

- Exams – 40%

- Quizzes – 30% (lowest dropped); missed pop quizzes will not have to be made up
- Homework – 20% (lowest dropped)
- Class Participation – 10% (a single grade assigned at the end of the quarter)

The grading scale is the standard 10-point scale used school-wide.

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## Course & Instructor Policies

The student is responsible for turning in all graded work on time, except for missed pop quizzes. Late work will be taken without penalty with a written excuse, and with a 10% penalty per school day without an excuse. The student may work with the instructor to rework exam problems for half credit, and extra assignments for quiz grades, *at the instructor's discretion as the school schedule allows.*

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## Academic Integrity

> The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.
>
> Scholastic Dishonesty, any student who commits an act of scholastic dishonesty is subject to discipline. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts.
>
> Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the school's policy on plagiarism (see the student handbook for details).