CALCULUS I

1. General Information

- Course: Math 101-004, Fall 2009
- Time: MW 1:10pm-2:25pm
- Location: 207 Mathematics Building (note room change)
- Instructor: Sabin Cautis
- Office: 413 Mathematics Building
- Office Hours: Monday and Wednesday 4:30-5:30PM (tentative) or by appointment
- E-mail: scautis@math.columbia.edu
- Website: includes syllabus, course schedule and homework assignments
- Text: *Calculus, Early Transcendentals* by James Stewart (6th edition). The book is available in the Columbia Bookstore and the library has many copies of the book on reserve.

**Homework:** Homework will be assigned every week on Monday and due the following Monday at the end of class. The precise assignment will be available on the course homepage. You may get help from any source. However, for your own benefit, you are strongly encouraged to attempt the problems yourself before seeking assistance. Any written work submitted must be your own. Your submitted work must be stapled together and should have your name on every page.

I will accept homeworks dropped off in the homework collection box outside office 410 Math Building until 4PM on the day it is due, after that homework will be late. Late homeworks will not be accepted for credit. If you use the drop box, make sure you use the one labeled for our section (section 4).

**Tests:** There will be two midterm exams and a final exam. The tests will be closed book-closed notes tests. Calculators will not be allowed. The dates for the two midterms will be: Wednesday, October 7th and Wednesday November 11th. The exams will be held in class during the usual meeting time.

**Grades:** Grades will be computed as follows: Homework: 20 % (the lowest homework score will be dropped), Midterms 20% each, Final 40%.

**Help Rooms:** Milbank 333 on the Barnard campus – 10am-10pm Monday-Thursday, 1pm-5pm Friday

**Final Exam:** The final exam is projected for Monday December 21 from 1:10pm to 4:00pm. Please make sure to book your travels accordingly.
2. Schedule

Very rough course schedule, subject to later adjustments:

- Sep 9 sect. 1.1, 1.2:
  Representing a function; A catalog of essential functions
- Sep 14/16 sect. 1.3, 1.5, 1.6:
  New functions from old functions; Exponential functions; Inverse functions and logarithms
- Sep 21/23 sect. 2.1, 2.2, 2.3:
  The tangent and velocity problems; The limit of a function; Calculating limits using limit laws
- Sep 28/30 sect. 2.5, 2.6, 2.7, 2.8:
  Continuity; Limits at infinity and horizontal asymptotes; Derivatives and rates of change; The derivative as a function
- Oct 5 sect. 3.1, 3.2
  Derivatives of polynomials and exponential functions; The product and quotient rules;
- Oct 7 MIDTERM I
- Oct 12/14 sect. 3.2, 3.3, 3.4:
  The product and quotient rules; Derivatives of trigonometric functions; The chain rule
- Oct 19/21 sect. 3.5, 3.6, 3.9:
  Implicit differentiation; Derivatives of logarithmic functions; Related rates
- Oct 26/28 sect. 3.10, 4.1, 4.2:
  Linear approximations and differentials; Maximum and minimum values; The Mean Value Theorem
- Nov 2 Academic Holiday
- Nov 4 sect. 4.3, 4.4, 4.5:
  Indeterminate forms and l’Hospital’s rule; How derivatives affect the shape of a graph; Summary of curve sketching
- Nov 9 sect. 4.7, 4.8:
  Optimization problems, Newton’s method and Review
- Nov 11 MIDTERM II
- Nov 16/18 sect. 4.7, 4.8, 4.9:
  Optimization problems, Newton’s method
- Nov 23/25 sect. 5.1, 5.2:
  Antiderivatives, Areas and distances; The definite integral
- Nov 30/ Dec 2 sect. 5.3, 5.4, 5.5:
  Indefinite integrals and the Net Change Theorem; The substitution Rule
- Dec 7/9 sect. 6.1:
  Areas between curves and review
- Dec 14 Course review