

Carnegie Mellon University
Differential & Integral Calculus (Math 21-120)
Fall 2004

Instructor Information

Ashwin Vaidya
6209 Wean Hall
412-268-6133
avaidya@andrew.cmu.edu (When sending email, please indicate course number in the
“Subject” slot of the email)
www.math.cmu.edu/~avaidya (Please go to the website for a link to the course page. You
will find a copy of the syllabus through this site and I will also occasionally place
materials and useful links here).

Teaching Assistant

Caner Kazanci
6207 Wean Hall
412-268-3187
ckazanci@andrew.cmu.edu

Class Schedule

Lectures : MWF, 12:30-1:20pm, BH A53
Recitations : Section N: Tu,Th, 12:30-1:20pm, HBH 1002
 Section O: Tu,Th 1:30-2:20pm, BH 255A

Text Book

Calculus by James Stewart.

Course Outline

The objective of this course is to introduce differential and integral calculus. Topics will include functions, the difference quotient, limits, derivatives, the anti-derivative, integration and optimization. Several examples will be presented and particular emphasis will be laid on the application of these topics to problems in business and economics.

Office Hours

Instructor : M, W 11:00-12:00 or by appointment
TA's will also have additional office hours, which will be announced in class/recitation upon finalization.

Attendance Policy

Students are expected to attend class regularly and are responsible for missed lecture notes and announcements. If you know you will be missing a class ahead of time, please inform me of your absence and make arrangements with your classmates to obtain notes for the missed lecture.

Classroom Expectations

Everyone involved must contribute to a positive learning environment in both lectures and recitations. Please arrive on time, not leave early, keep cell phones turned off during lectures, not converse with fellow students during the lecture and use laptops only for note-taking.

Grading

The final grade will be based on the following:

3 Tests During the Term : 45 %

Final Exam : 25%

Quizzes : 15%

Homework : 15%

Quiz

Quizzes will be conducted in the recitation as per the schedule indicated. The objective of the quiz will be to test the students on the material covered the previous weeks. It is the student's responsibility to ensure with the TA that he/she has taken all the quizzes.

Additionally random, micro-quizzes may be given in class or in recitation according to the will of the instructor/TA.

Homework

Homework problems will be assigned as per the schedule indicated below and must be returned to your TA. You may work in groups but each student will have to turn in an independent homework set. Please make sure the work is legible and neat so we may understand your work. Late Homework assignments will not be accepted after the due date. Only selected problems will be graded but you must turn in all the assigned problems.

Makeup Policy

Makeup exams or quizzes are discouraged and will be given only upon prior notice, to the instructor or TA, of absence or in case of emergencies. Grading scheme mentioned above will be strictly adhered to and not changed or adjusted for any student.

Exam Dates

Dates for the tests and exams are mentioned on the schedule below and will also be announced in class well ahead of time.

Grade Assignment

Grade distribution is according to the following scheme:

90 – 100 : A

80 - 89 : B

70 - 79 : C

60 - 69 : D

Less than 60 : F

Departmental Placement Test

The Math department has made passing a basic skills test a pre-requisite for the course. These skills are described in the first 10 questions of the placement test taken by most students during the summer. May students have been identified as needing support and have been placed into 21-106 Cocalculus. We will give a second version of this test on the second day of class, Sept. 1 to identify students who need additional help or students who can improve their score and test out of Calculus.

Schedule for the Course

08/30	Introduction to the course and preview of Calculus.
09/01	Departmental placement test for 21-106.
09/03	Functions and their graphs (Section 1.1, 1.2)
09/06	Labor Day – No Class
09/08	Composition of functions (Sec. 1.3)
09/10	Exponential, Logarithm and Inverse functions (Sec. 1.5,1.6)
09/13	Tangents and Limits (Sec. 2.1,2.2)
09/15	Limit laws and definition of the limit (2.3,2.4)
09/17	Continuity and intermediate value theorem (Sec. 2.5)
09/20	Derivative (Sec. 2.8, 2.9)

09/22	Differentiation formulae (Sec. 3.1,3.2)
09/24	Chain Rule (Sec. 3.5)
09/27	Review of trigonometry & derivative of trigonometric functions (Sec. 3.4)
09/29	Review
10/01	Test 1
10/04	Derivative of exponential function, Implicit differentiation (Sec. 3.1, 3.6)
10/06	Derivative of log functions, Higher derivatives (Sec. 3.8,3.7)
10/08	Linear Approximations (Sec. 3.10,3.11)
10/11	Extreme values, mean value theorem (Sec. 4.1, 4.2)
10/13	Derivatives from graphs (Sec. 4.3)
10/15	Asymptotes (Sec. 4.4)
10/18	Curve Sketching (Sec. 4.5)
10/20	Mid-Semester Break – No Class
10/22	Optimization Problems (Sec. 4.7)
10/25	Review
10/27	Test 2
10/29	More optimization problems (Sec. 4.8)
11/01	More application problems.
11/03	Anti-derivatives (Sec. 4.10)
11/05	Summation and areas (Sec. 5.1, 5.2)
11/08	Definite integral (Sec. 5.2)
11/10	Fundamental theorem of calculus (Sec. 5.3)

11/12	Integration by substitution (Sec. 5.5)
11/15	Integration by trigonometric substitution (Sec. 5.5)
11/17	Review
11/19	Test 3
11/22	Integration by parts (Sec. 7.1)
11/24,26	Thanksgiving Break – No classes.
11/29	More integration by parts.
12/01	Area between curves (Sec. 6.1)
12/03	Volumes (Sec. 6.2)
12/06	Applications of integration to business & economics.
12/08	Additional material.
12/10	Review

Quiz Schedule (during Recitations)

09/06-09/10	Quiz 1
09/13-09/17	Quiz 2
10/11-10/15	Quiz 3
11/01-11/05	Quiz 4
11/08-11/12	Quiz 5
11/29-12/03	Quiz 6

The material for the quiz can be anything that has been covered in lecture or recitation before the time of the quiz and is left to the discretion of the instructor. The quizzes will be conducted in recitation hour and also graded by the TA's.

Homework Schedule

Homework 1

Sec. 1.3: 4, 47, 48.

Sec. 2.3: 12, 20, 22, 42, 48.

Due: Tuesday, 9/21

Homework 2

Sec. 2.9: 2, 4, 24, 26, 28, 30.

Due: Tuesday, 9/28

Homework 3

Sec. 3.2: 3,5,6,

Sec. 3.5: 5,6,

Sec. 3.6: 8,10.

Due: Tuesday, 10/12

Homework 4

Sec. 3.8: 16, 22, 36, 44

Sec. 3.10: 14, 24

Sec. 3.11: 35, 42.

Due: Tuesday, 10/19

Homework 5

Sec. 4.7: 10, 12, 24, 33.

Sec. 4.10: 34, 76

Due: Tuesday, 11/09

Homework 6

Sec. 5.1: 18, 20

Sec. 5.2: 34, 36.

Sec. 5.5: 52, 60, 63, 65.

Due: Thursday, 11/18