Course Title: Multi-variable Advanced Calculus
Course Number: Math 32404

Pre-requisites: Math 32300 and Math 34600

Catalog Description: A second semester of advanced calculus, with emphasis on topics in multi-variable calculus.

Sequences, continuity, compactness, completeness, differentiation and integration in $\mathbf{R}^n$, implicit and inverse function theorems, line and surface integrals, theorems of Green, Gauss and Stokes.

Instructor: Pat Hooper
Office: NAC 6/282
Office Hours: Mondays and Wednesdays 3:30-5pm on any day our class meets. You can also make an appointment.
Telephone: 212-650-5149
Email: whooper@ccny.cuny.edu

Class Hours: Mondays and Wednesdays 6-7:40pm in NAC 6/328

Text: Advanced Calculus by Gerald B. Folland, Prentice-Hall, 2002

Topics to be Covered:

Chapter	Topics	Number of Weeks
1	Continuity, Completeness, Compactness, Connectedness, Uniform Continuity	2
2	Differential Calculus: Chain Rule, Mean-Value Theorem, Taylor's Theorem and Extreme Values	2.5
3	The Implicit Function Theorem and Applications: Curves in the Plane; Curves and Surfaces in Space	2.5
4	Integral Calculus: Multiple Integrals and Iterated Integrals, Fubini's Theorem	2.5
5	Line and Surface Integrals : Green's, Gauss' and Stokes' Theorems, Differential Forms	3
8	Fourier Series	1.5

COURSE LEARNING OUTCOMES

.

After taking this course, the student should be able to:	Contributes to Departmental Learning Outcome(s):
1. state the definitions of basic terms in beginning analysis of several real variables and the topology of n-dimensional real space , and use them in computations and proofs	a, b, e1, e2, g
2. analyze the properties of given functions and sets	a, b, e2
3. construct examples and counterexamples	b, e2
4, state and apply the Chain Rule, Mean Value Theorem, Taylor's Theorem, and Implicit Function Theorems and prove special cases of each theorem	a, e1, e2, f, g
5. compute line and surface integrals	a
6. state and apply Fubini's Theorem, Green's, Gauss' and Stokes' Theorems, and prove some of the lemmas used in their proofs	a, e1. e2. f. g

COURSE ASSESSMENT TOOLS

1. Class grade: 60%
2. Final Exam: 40%

DEPARTMENTAL LEARNING OUTCOMES

The mathematics department, in its varied courses, aims to teach students to

a. perform numeric and symbolic computations
b. construct and apply symbolic and graphical representations of functions
c. model real-life problems mathematically
d use technology appropriately to analyze mathematical problems
e. state (e1) and apply (e2) mathematical definitions and theorems
f. prove fundamental theorems
g. construct and present (generally in writing, but, occasionally, orally) a rigorous mathematical argument.

Academic Integrity: The CCNY policy on academic integrity will be followed. (See http://www1.ccny.cuny.edu/current/integrity.cfm.) In regard to homework problems: Students are strongly encouraged to work together, but should not simply copy someone else's work.