MA220 – Multivariable Calculus

Dr. Stefan Ehrlich

Graduate Computer Science / Mathematics Department

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Text:
Multivariable Calculus
Ostebee, Zorn, 2004
Houghton Mifflin, Second Edition

Office Hours:
Monday 12:30- 2:15, 5:30- 6:30
Wednesday 12:30-2:15, 5:30-6:30
Thursday 2:00-3:30

Brief Course Description:

Calculus lll/ Multivariable Calculus is designed to bridge the gap between single variable first year calculus and its extension to higher dimensions.

The basic core material that will be covered includes:

sequences and infinite series, power series, polar coordinates – single variable calculus
derivatives, multiple and iterative integrals - multi variable calculus

Every effort will be made to provide numerous illustrations of the subject matter.

Course Objectives:

This course has been designed with two important goals in mind:

the completion of material found in single variable calculus's courses
the introduction of partial differentiation and multiple integration

A solid understanding of these topics is essential for further study in the field of mathematical analysis

Classroom Policies:

Students are expected to attend and participate in all classes. Attendance is taken at the beginning of each period. Please notify the instructor in advance of any anticipated absence whenever possible. It is your responsibility to make up any material missed whenever you are absent. Assignments are related to material covered in class. The homework problems are always covered in a timely fashion and questions about the problems should be raised at the next class meeting. The study of mathematics/computer science requires regular work and plenty of practice. Postponed homework usually results in poor comprehension and performance.

Teaching Strategies:

Lecture format, with numerous examples chosen to illustrate theoretical concepts. Lots of drill with emphasis on practice, practice, and more practice. Questions are encouraged and discussion of material stressed.

Course Requirements and Grading Policies:

Students will be evaluated based on two midterms, a set of homework assignments, and a final exam as follows:

Midterms - 40% Homework Assignments – 20% Final - 40%

All tests are closed book and the final is comprehensive. The results will be converted to a letter grade in keeping with grading policies of the college.

Material Covered:

1. Sequences, Series, and Limits

   Sequences, Convergence and Divergence
   Formal Definition of Limit and Illustrative Examples
   Infinite Series and Tests for Convergence and Divergence
   Power Series
   Taylor Series

2. Polar Coordinate System

   Polar Coordinates
   Graphs of Polar Equations
   Differentiation of Polar Equations
   Integrals in Polar Coordinates

3. Derivatives

   Multivariable Functions and Surfaces in Space
   Partial Differentiation
   Higher Order Partial Derivatives and Linear and Quadratic Approximation
   Maxima and Minima
   Chain Rule

4. Integration

   Multiple Integrals and Approximating Sums
   Iterative Integrals
   Integrals over Nonrectangular Regions
   Double Integrals in Polar Coordinates