Mathematics 251 Section: E100 Term: 2010 Spring Instructor: John Stockie Discussion Topics: Course Description Rectangular, cylindrical and spherical coordinates. Vectors, lines, planes, cylinders, quadric surfaces. Vector functions, curves, motion in space. Differential and integral calculus of several variables. Vector fields, line integrals, fundamental theorem for line integrals, Greens theorem. In addition to regularly scheduled lectures, students registered in this course are encouraged to come for assistance to the Calculus Workshop (Burnaby), or Math Open Lab (Surrey). Course Outline Chapter 12 -Vectors and Geometry of Space 1. Three Dimensional Coordinate System 2. Vectors 3. The Dot Product 4. The Cross Product 5. Equations of Lines and Planes 6. Cylinders and Quadric Surfaces Chapter 13 -Vector Functions 1. Vector Functions and Space Curves 2. Derivatives and Integrals of Vector Functions 3. Arc Length and Curvature 4. Motion in Space Chapter 14 -Partial Derivatives 1. Functions of Several Variables 2. Limits and Continuity 3. Partial Derivatives 4. Tangent Planes and Linear Approximations 5. The Chain Rule 6. Directional Derivatives and the Gradient Vector

Calculus III

## Calculus III

7. Maximum and Minimum Values 8. Lagrange Multipliers and Constrained Maximum-Minimum Problems Chapter 15 -Multiple Integrals 1. Double Integrals over Rectangles 2. Iterated Integrals 3. Double Integrals over General Regions 4. Double Integrals in Polar Coordinates 5. Applications of Double Integrals 7. Triple Integrals 7. Triple Integrals in Cylindrical Coordinates 7. Triple Integrals in Spherical Coordinates 9. Change of Variables in Multiple Integrals Chapter 16 -Vector Calculus 1. Vector Fields 2. Line Integrals 3. The Fundamental Theorem for Line Integrals 4. Green's Theorem

Grading:

Homework - 10% Midterms - 40% Final Exam - 50%

Required Texts: Calculus Early Transcendentals 6th Edition Author: James Stewart Publisher Thomson Brooks/Cole ISBN: 495011665

Recommended Texts:

Materials/Supplies:

Prerequisite/Corequisite:

## Calculus III

Prerequisite:

Required: MATH 152 or 155; or MATH 158 with a grade of at least B.

Recommended: It is recommended that MATH 240 or 232 be taken before or concurrently with MATH 251.

Quantitative.

Notes:

THE INSTRUCTOR RESERVES THE RIGHT TO CHANGE ANY OF THE ABOVE INFORMATION.

Students should be aware that they have certain rights to confidentiality concerning the return of course papers and the posting of marks. Please pay careful attention to the options discussed in class at the beginning of the semester.

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