THE COLLEGE AT OLD WESTBURY
STATE UNIVERSITY OF NEW YORK

Department of Mathematics, Computer & Information Science

CALCULUS & ANALYTIC GEOMETRY III
MA3330 ● SYLLABUS SPRING 2014

Professor: **Frank Sanacory**
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Course Web Site: **sanacory.net**

TEXTBOOK: Calculus Multivariable by Howard Anton, Irl C. Bivens and Stephen Davis.

PREREQUISITES: MA2320: Calculus & Analytic Geometry II.

COURSE DESCRIPTION: We will continue with the Calculus from MA 2320. We will study three main areas. The first is vector algebra and geometry of three-dimensional space including: lines, planes, and curves in space; polar, cylindrical, and spherical coordinate systems. Then using this geometry we learn limits, partial differentiation, directional derivatives, max-min theory and Lagrange Multipliers. The final area of study is integration, including double, triple integrals, line integrals, and the divergence, Green's and Stokes Theorems.

COURSE OBJECTIVES: After successful completion of this course students should understand the algebra of vectors, meaning of limits, continuity, and derivatives of functions of two or three variables and double and triple integrals and green's Theorem. Also be able to use these skills to solve a variety of problems.

COURSE EVALUATION & GRADING: Your grade for the course will be based on your homework/quiz performance and a computer project (20%), two tests (45%) and a comprehensive final exam (35%).

CALCULATOR: No calculator is allowed.

TUTORIAL: Drop-in tutorial is available in the Mathematics Learning Center.

ACCOMMODATIONS FOR STUDENTS WITH SPECIAL NEEDS: If you have, or suspect you may have a physical, psychological, medical or learning disability that may impact how you function academically and/or your access to activities on campus, please contact Dr. Lisa Whitten, Director of the Office of Services for Students with Disabilities (OSSD). She will determine whether or not you qualify for academic accommodations and arrange them with your professors if you do. The OSSD is located in the NAB, Room 2064. You can reach Dr. Whitten at 516-876-3009 or whittenl@oldwestbury.edu.

RESPECT: No cell phones in class and no texting.

FINAL EXAM: Will be held Monday May 12 in our regular classroom at the regular class time.

TOPICS TO BE COVERED

Ch 11 Three-Dimensional Space; Vectors
11.1 Rectangular Coordinates in 3-Space; Spheres; Cylindrical Surfaces
11.2 Vectors
11.3 Dot Product; Projections
11.4 Cross Product
11.5 Parametric Equations of Lines
11.6 Planes in 3-Space
11.7 Quadric Surfaces
11.8 Cylindrical and Spherical Coordinates

Ch 12 Vector-Valued Functions
12.1 Introduction to Vector-Valued Functions
12.2 Calculus of Vector-Valued Functions
12.3 Change of Parameter; Arc Length
12.4 Unit Tangent, Normal, and Binormal Vectors
12.5 Curvature
12.6 Motion Along a Curve

Ch 13 Partial Derivatives
13.1 Functions of Two or More Variables
13.2 Limits and Continuity
13.3 Partial Derivatives
13.4 Differentiability, Differentials, and Local Linearity
13.5 The Chain Rule
13.6 Directional Derivatives and Gradients
13.7 Tangent Planes and Normal Vectors
13.8 Maxima and Minima of Functions of Two Variables
13.9 Lagrange Multipliers

Ch 14 Multiple Integrals
14.1 Double Integrals
14.2 Double Integrals over Nonrectangular Regions
14.3 Double Integrals in Polar Coordinates
14.4 Surface Area; Parametric Surfaces
14.5 Triple Integrals
14.7 Change of Variable in Multiple Integrals; Jacobians

Ch 15 Topics in Vector Calculus
15.1 Vector Fields
15.2 Line Integrals
15.3 Independence of Path; Conservative Vector Fields
15.4 Green's Theorem
15.5 Surface Integrals
15.6 Applications of Surface Integrals; Flux
15.7 The Divergence Theorem