



CALCULUS III – Spring 2009

Subject Code: AMAT 223

Number of periods per week: 3

Number of total weeks: 13

Office: Room 203, New Building

Office Hours: Monday 14:00-15:00, Tuesday 13:00-14:00, Thursday 13:00-15:00

Lecturer: Panagiota Konstantinou

Email: eng.kp@fit.ac.cy

Tel: 22431355 Ext. 195

Course Outline:

- Three Dimensional Space, Vectors: Rectangular coordinates & 3-D vectors, the vector (cross) and dot products of two vectors, Lines & planes in space, quadric and more general surfaces.
- Vector Valued Functions: Vector valued functions, Curves and motion in space.
- Functions of several variables and optimization: Functions of several variables and the chain rule, Directional derivatives and the gradient vector, Tangent Planes, Maximum and minimum of functions of several variables, the 2nd derivative test for functions of two variables, Lagrange Multipliers and constrained max-min problems.
- Double Integrals: Double integrals over general regions, Area and volume by double integration, Change of variables in double integrals, Double integrals in polar coordinates
- Vector Fields and Line Integrals: The Del operator (Div, grad, and Curl in rectangular coordinates), Vector fields, Line integrals, the fundamental theorem and independence of path, Green's theorem.
- Triple Integrals: Triple Integrals, Volume by triple integration, Change of variables in triple integrals, Triple integrals in cylindrical and spherical coordinates.
- Surface Area and Surface integrals.
- Divergence and Stoke's theorems.

Assessment:

- Final exam 60%
- Coursework 40%
 - Test 1: 30/3/09 50% of coursework
 - Test 2: 11/5/09 50% of coursework

Textbooks:

- Anton H., Bivens I, and Davis S: "Calculus", 7th Edition, John Wiley & Sons, 2002

References:

- Jerrold E. Marsden, Anthony J. Tromba, Vector Calculus, W.H. Freeman & Company; 4th edition, April 1996.
- H. M. Schey, Div, Grad, Curl, And All That: An Informal Text On Vector Calculus, W W Norton & Co Inc; January 2005.

Prerequisites:

- Calculus II, AMAT 122