

# Mathematics 13 – Term Syllabus

(Section numbers from Marsden, Tromba, Weinstein)

The Undergraduate Program Committee

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Lecture	Topics	Some Standard Examples/Concepts
Day 1	Review of algebra and geometry in Euclidean space (1.1 - 1.5)	Vector notation, dot and cross products, lines, planes
Day 2	Curves in Euclidean space (1.6)	Curves, tangent vector, tangent line
Day 3	Graphs, level surfaces, partial derivatives, and continuity (2.1 - 2.2)	
Day 4	Differentiability, the derivative matrix, tangent planes (2.3)	
Day 5	The Chain Rule, Gradients and Directional Derivatives (2.4 - 2.5)	
Day 6	Directional Derivatives and Implicit differentiation (2.5 - 2.6)	
Day 7	Curves and acceleration (4.1)	
Day 8	Arclength (4.2)	
Day 9	Vector Fields (4.3)	
Day 10	Divergence and Curl (4.4)	
Day 11	Divergence and Curl (4.4 / 5.1)	
Day 12	Volume and Cavalieri's Principle (5.1)	

Day 13	Double integral over a rectangle (5.2 / 5.3)	
Day 14	Double Integral over other regions (5.3)	
Day 15	Triple Integrals (5.4)	
Day 16	Change of Variables, cylindrical and spherical coordinates (5.5)	
Day 17	Change of Variables, cylindrical and spherical coordinates (5.5)	
Day 18	Applications (5.6)	Center of Mass, moments of inertia
Day 19	Line Integrals (6.1)	
Day 20	Line Integrals (6.1)	
Day 21	Parametrized surfaces (6.2)	
Day 22	Area of a surface (6.3)	
Day 23	Surface Integrals (6.4)	
Day 24	Green's theorem (7.1)	
Day 25	Stokes' Theorem (7.2)	
Day 26	Stokes' Theorem (7.2)	
Day 27	Gauss' theorem (7.3)	
Day 28	Path Independence and the Fundamental Theorem of Calculus (7.4)	