

Calculus III – Multivariable

Scope and Sequence

Hanford High School
450 Hanford St.
Richland, WA 99354

Teacher: Greg Kelly
(2015-2016 school year)
greg.kelly.hhs@gmail.com

Textbook: Multivariable Calculus
Sixth Edition 2008
by James Stewart
Thomson Brooks/Cole

<u>Chapter</u>	<u>Topic</u>	<u>Days</u>
11	Parametric Equations and Polar Coordinates	17
11.1	Curves Defined by Parametric Equations	
11.2	Calculus with Parametric Curves	
11.3	Polar Coordinates	
11.4	Areas and Lengths in Polar coordinates	
11.5	Conic Sections	
11.6	Conic Sections in Polar Coordinates	
12	Infinite Sequences and Series	29
12.1	Sequences	
12.2	Series	
12.3	The Integral Test and Estimates of Sums	
12.4	The Comparison Tests	
12.5	Alternating Series	
12.6	Absolute Convergence and the Ratio and Root Tests	
12.7	Strategy for Testing Series	
12.8	Power Series	
12.9	Representations of Functions as Power Series	
12.10	Taylor and Maclaurin Series	
12.11	Applications of Taylor Polynomials	
13	Vectors and the Geometry of Space	15
13.1	Three-Dimensional Coordinate Systems	
13.2	Vectors	
13.3	The Dot Product	
13.4	The Cross Product	
13.5	Equations of Lines and Planes	
13.6	Cylinders and Quadric Surfaces	
14	Vector Functions	13
14.1	Vector Functions and Space Curves	
14.2	Derivatives and Integrals of Vector Functions	
14.3	Arc Length and Curvature	
14.4	Motion in Space: Velocity and Acceleration	

<u>Chapter</u>	<u>Topic</u>	<u>Days</u>
15	Partial Derivatives	22
15.1	Functions of Several Variables	
15.2	Limits and Continuity	
15.3	Partial Derivatives	
15.4	Tangent Planes and Linear Approximations	
15.5	The Chain Rule	
15.6	Directional Derivatives and the Gradient Vector	
15.7	Maximum and Minimum Values	
15.8	Lagrange Multipliers	
16	Multiple Integrals	27
16.1	Double Integrals over Rectangles	
16.2	Iterated Integrals	
16.3	Double Integrals over General Regions	
16.4	Double Integrals in Polar Coordinates	
16.5	Applications of Double Integrals	
16.6	Triple Integrals	
16.7	Triple Integrals in Cylindrical Coordinates	
16.8	Triple Integrals in Spherical Coordinates	
16.9	Change of Variables in Multiple Integrals	
17	Vector Calculus	27
17.1	Vector Fields	
17.2	Line Integrals	
17.3	The Fundamental Theorem for Line Integrals	
17.4	Green's Theorem	
17.5	Curl and Divergence	
17.6	Parametric Surfaces and Their Areas	
17.7	Surface Integrals	
17.8	Stokes Theorem	
17.9	The Divergence Theorem	
18	Second Order Differential Equations	10
18.1	Second Order Linear Equations	
18.2	Non-homogeneous Linear Equations	
18.3	Applications of Second-Order Differential Equations	
18.4	Series Solutions	
Total Number of Class Days:		160