King Abdulaziz University	**Math 203 Syllabus**	Mathematics Department
Faculty of Science		Second Semester (2015)

Textbook: CALCULUS Early Transcendental, Seventh Edition (2010), Author: James Stewart

		Lectures				
Chapter Title	**Section Title**	**Subtitle**	**Examples**	**Exercises**	**Home Work**	**Remarks**
Chapter 10 Parametric Equations and Polar Coordinates	**10.1** Curves Defined by Parametric Equations	Parametric Equations	**1,3,5**	**13,18,19**	11-17, 20-22	
	10.2 Calculus with Parametric Curves	Tangents, Areas, Arc Length, Surface Area.	**1,2,3, 4,5,6**		1-6,8,9,10, 41,42,45,46	
	10.3 Polar Coordinates	Polar Coordinates, Polar Curves, Symmetry, Tangent to Polar Curves, Graphing Polar Curves with Graphing Devices.	**1,2,3,4, 5,7,9**	**16,24,25**	1-6,9,11,15, 17,22	
	10.4 Areas and Arc Length in Polar Coordinates	Area, Arc Length.	**1**	**1,3,45,46**	2,4,17, 19,47	
	10.5 Conic Sections	Parabola, Ellipse, Hyperbola, Shifted Conics.	**1,2,3,4, 5,6,7**	**8,16,33,34, 37,40,45,47**	1-7,11-15, 31-48	
	10.6 Conic Sections in Polar Coordinates	Conic Sections in Polar Coordinates	**1,2**	**1,2,3, 9,13**	4-8,10-15	

Chapter 12 Vectors and the Geometry of Space	**12.1** Three-Dimensional Coordinate Systems	Distance Formula in Space, Equation of a Sphere.	**1,2,4, 6**	**10,18,31**	7,8,15-17,24	
	12.2 Vectors	Combining Vectors, Vector Algebra Operations, Components, Unit Vectors	**1,2,3, 4,5,6**	**21,25**	7-16,17,18, 20,22	
	12.3 The Dot Product	Definition and Properties of the Dot Product, Angle Between Vectors, Direction Angles and Direction Cosines, Projections.	**1,2,3,4, 5,6**	**38,41**	1,2,3-10, 15-20,35-40	
	12.4 The Cross Product	Definition and Properties of the Cross Product, Triple Products.	**1,2,3,4,5**	**35**	1-6,29-32,36	
	12.5 Equations of Lines and Planes	Parametric Equations of the Line, Planes.	**1,2,4, 5,6,7,9**	**20,21,22, 30,71**	2-5,20, 23-28, 31,35,43-45	
	12.6 Cylinders and Quadric Surfaces	Cylinders, Quadric Surfaces. (**Table 1**)	**1,2,3, 4,6**			
Chapter 13 Vector Functions	**13.1** Vector Functions and Space Curves	Limit and Continuity.	**1,2,4**		1,3,4,6,15	
	13.2 Derivatives and Integrals of Vector Functions	Derivatives, Unit Tangent Vector, Integrals.	**1, 4,5**	**18**	9-12,17,18, 23,24,33-37	
	13.3 Arc Length and Curvature	Length, Curvature, The Normal and Binormal Vectors.	**1,3,4, 5,6**	**4**	1,2,5,9, 21-25,43,44	
	13.4 Motion In Space: Velocity and Acceleration	Velocity, Speed, Acceleration, Tangential and Normal Components of Acceleration.	**1,2,3,7**	**39**	3-14,16, 33,34	

Chapter 14 Partial Derivatives	**14.1** Functions of Several Variables	Functions of Two Variables, Domain, Rang, Level Curves, Functions of Three or More Variables.	**1,4,6,8**	**9,13,20**	7,8,9,10,12, 13,19	
	14.2 Limits and Continuity	Limits (Tables 1,2), Continuity, Functions of Three or More Variables.	**1,2,4,5, 7,8**	**14,17, 33**	5,6,7,9,10,12 , 18,30,37,38	
	14.3 Partial Derivatives	Partial Derivatives of a Function of Two Variables, Functions of More Than Two Variables, Higher Derivatives, Laplace's Equation, Wave Equation.	**1,2,3,5, 6,7,8,9**	**17,34, 41,63**	15,16,19,20, 21,22,26,27, 35,41,45,46, 48,51,53,61, 65	
	14.4 Tangent Planes and Linear Approximation	Linearization, Total Differential.	**2,4**	**12,25**	2,3,4,6,11, 13,14,26,27	
	14.5 The Chain Rule	The Chain Rule, Implicit Differentiation.	**1,3,5,8,9**	**10,21, 30,34**	2,4,6,7,8,24, 25,27-29,31	
	14.6 Directional Derivatives and Gradient Vector	Directional Derivatives, The Gradient Vector, Functions of Three Variables, Maximizing the Directional Derivatives, Tangent Planes to Level Surfaces, Normal Line.	**2,3,4,5, 6,8**	**9,12, 25,42**	4,5,6,7,8,11, 12,21,24,25, 39,44	
	14.7 Maximum and Minimum Values	Local Maximum and Minimum Value, Saddle Point.	**3**	**6,7**	1,2,8-18	
	14.8 Lagrange Multipliers	Lagrange Multiplier.	**2**	**4,7**	3,5,6,8,9, 10-13	

Notes:

1- All examples and exercises in the lectures part must be solved by the instructor.

2- Homework should be solved and submitted to instructor.