King Abdulaziz University **Math 205 Syllabus** **Department of Mathematics**

Second Semester 2009-10 **Second Semester 1430-31**

Textbook: Thomas' Calculus, Eleven Editions (2008), Authors: Weir, Hass and Giordano

		Lectures				
Chapter Title	**Section Title**	**Subtitle**	**Examples**	**Exercises**	**HW**	**HW on line: Due date (end of)**
Chapter 11 Infinite Sequence and Series	**11.1** Real Numbers and the Real Line	Convergence and Divergence, Calculating Limits of Sequence, Using L'Hopital's Rule, Commonly Occurring Limits, Recursive Definitions, Bounded Nondecreasing Sequences	1-13	88	1-85(odd),91, 97,119,	**1 5,25, 35,55 4th Week**
	11.2 Infinite Series	Geometric Series, Divergent Series, The nth-Term Test for Divergence, Combining Series, Adding or Deleting Terms, Reindexing	1-10		1-60 (odd),68,70	**3,15,47,57 3rd Week**
	11.3 The Integral Test	Nondecreasing Partial Sums, The Integral Test	1-4	39	1-30(odd),31,42	**5,13,23,25,27 4th Week**
	11.4 Comparison Tests	The Comparison test, The Limit Comparison Test	1-3	8,20,26	1-35(odd),38,40	**1,9,21,23 5th Week**
	11.5 The Ratio and Root Tests	The Ratio Test, The Root Test	1-3	16,20,30	1-43(odd),47	**1,15,19,31,41 5th week**
	11.6 Alternating Series, Absolute and Conditional Converg.	The alternating Series Test, Absolute and Conditional, Rearranging Series	1-6	5,8,15,31	1-43(odd),51,58	**1,7,23,35,37, 39 5th Week**

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Chapter Title	**Section Title**	**Subtitle**	**Examples**	**Exercises**	**HW**	**Due date (end of)**
Chapter 11 Infinite Sequence and Series	**11.7** Power Series	Power series and Convergence, The Radius of Convergence of a Power Series, Term-by-Term differentiation and Integration	1-6		1-37(odd),39,42,46	**3,13,21,27,37 6th week**
	11.8 Taylor and Maclaurin Series	Series Representations, Taylor and Maclaurin Series, Taylor Polynomials	1-4		1-27(odd),29,33	**1,5,15,23,27 6th week**
	11.9 Convergence of Taylor Series	Taylor's Theorem, Estimating the reminder, Truncation Error, Combining Taylor Series, Euler's Identity	1-7		1-37(odd)	**1,9,19,31 7th Week**
	11.10 Applications of Power Series	The Binomial Series for Powers and Roots, Evaluating Nonelementry Integrals, Evaluating Indeterminate Forms	1-2,5-9		1-15(odd), 33-55(odd),57	**5,35,47,53 7th Week**
	11.11 Fourier Series	Continuity at a point, Continuous Functions, Composites, Continuous Extension to a point, Intermediate Value Theorem for Continuous Functions	1	2,11		**1,5,13,29,39 7th Week**

		Lectures				
Chapter Title	**Section Title**	**Subtitle**	**Examples**	**Exercises**	**HW**	**Due date (end of)**
Chapter 15 Multiple Integrals	**15.1** Double Integrals	Double Integrals over Rectangles, Double Integrals as Volumes, Fubini's Theorem for Calculating Double Integrals, Double Integrals over Bounded Nonrectangular Regions, Finding Limits of Integration, Properties of Double Integrals	1-4		1-49(odd)	**1,7,17,29,35, 41,55** **8th Week**
	15.2 Area, Moments, and Centers of Mass	Areas of Bounded Regions in the Plane, Average, Moments and centers of Mass for Thin Flat Plates, Moments of Inertia, Centroids of Geometric Figures	1-6		1-29(odd)	**3,11, 17,21** **8th Week**
	11.3 Double Integrals in Polar For m	Integrals in Polar Coordinates, Finding Limits Of Integration, Changing Cartesian Integrals into Polar Integrals	1-4		1-31(odd),33,37	**7,15,23,29** **9th Week**
	15.4 Triple Integrals in Rectangular Coordinates	Triple Integrals, Volume of a Region in Space, Average Value of a Function in Space, Properties of Triple Integrals	1-5		1-47(odd),	**1,7,25,37,43** **9th Week**
	15.5 Masses and Moments in Three Dimensions	Masses and Moments,	1-2		1-17(odd)	**3,11,15,37, 49** **10th Week**
	15.6 Triple Integrals in Cylindrical and Spherical Coordinates	Integration in Cylindrical Coordinates, How to Integrate in Cylindrical Coordinates, Spherical Coordinates and Integrations, How to Integrate in Spherical Coordinates	1-6		1-67(odd)	**9,25,33,45** **10th Week**
	15.7 Substitution in Multiple Integrals	Substitutions in Double Integrals, Substitutions in Triple Integrals	1-3		1-21(odd)	**1,7,13,19** **10th Week**

		Lectures				
Chapter Title	**Section Title**	**Subtitle**	**Examples**	**Exercises**	**HW**	**Due date (end of)**
Chapter 16 Integration in Vector Fields	**16.1** Line Integrals	How to Evaluate a Line Integral, Additivity, Mass and Moment Calculations,	1-4		1-27(odd)	**1,9,15,21, 27 11th Week**
	16.2 Vector Fields, Work, Circulation, and Flux	Vector Fields, Gradient Fields, Work Done by a Force over a Curve in Space, Flow Integrals and Circulation for Velocity Fields, Flux Across a Plane Curve	1-5		1-29(odd),37-43(odd)	**1,9,13,19 11th Week**
	16.3 Path Independence, potential Functions, and Conservatives Fields	Path Independence, Lines Integrals in Conservative Fields, Finding Potentials for Conservative Fields, Exact Differential Forms	1-4		1-23(odd),25,27	**1,7,11,29 11th Week**
	16.4 Green's Theorem in the Plane	Divergence, Spin Around an Axis: The k-Component of Curl, Two Forms For Green's Theorem, Mathematical Assumptions, Using Green's theorem to Evaluate Line Integrals	1-5		1-21	**1,11,15,19, 21 12th Week**
	16.5 Surface Area and Surface Integrals	Surface Area, Surface Integrals, Orientation, Surface Integrals for Flux, Moments and Masses for Thin Shells	1-5		1-35(Odd)	**7,9,19,27 12th Week**
	16.6 Parametrized Surface	Parametrization Surface, Surface Area, Surface Integrals	1-8		1-51(odd)	**11,25,31, 39,47 13th Week**
	16.7 Stokes' Theorem	Stokes' Theorem, Paddle Wheel Interpretation of , Stokes' Theorem for Surface with Holes, An Important Identity , Conservative Fields and Stokes' Theorem	1-5		1-18	**1,7,15,17 13th Week**
	16.8 The Divergence Theorem and a Unified Theory	Divergence in Three Dimensions, Divergence Theorem , Divergence Theorem for other Regions	1-4		1-19	**1,4,11,15 13th Week**

Note:

1. **All examples and exercises in the lectures part must be solved by the instructor.**
2. **Homework should be submitted online on or before the due date**
3. **Any student who misses 25% of the class will receive DN.**

Marks distribution

1. **First Exam (90 Min; 25 Marks); Second Exam (90 Min; 25 Marks); Final Exam (120 Min; 40 Marks)**
2. **10 Marks for HW online.**