King Abdulaziz University

Math 110 Syllabus

**Department of Mathematics** 

First Semester 2010-11

First Semester 1431-32

Textbook: Calculus, early transcendentals, Sixth Editions (2008), Authors: James Stewart

		Lectures				
Chapter Title	Section Title	Subtitle	Examples	Exercises	HW	HW on line: Due date (end of)
	Appendix A (2 Lectures)	Numbers, Intervals, solving Inequalities, and Absolute Value.	1-8	11 ,32,45	1-59 (Odd)	4,6,29,32,33,36,4 5,49,55 3 <sup>th</sup> Week
Appendices	Appendix B (1 Lecture)	Coordinate Geometry and Lines	1-8	13,41,51	2-60 (Even)	6,11,14,20,34,35, 38,52 3 <sup>th</sup> Week
	Appendix D (2 Lectures)	Trigonometry	1-6		2-82 (Even)	3,10,14,25,31,36, 42,59,66,69,73 3 <sup>th</sup> Week

		Lectures				
Chapter Title	Section Title	Subtitle	Examples	Exercises	HW	Due date (end of)
	<b>1.1</b> Four Ways to Represents of Functions (1 Lecture)	Representation of Functions, Piecewise Defined Functions, Symmetry, Increasing & decreasing Functions	1-3, 6,7,8,10,11	1	2,5,8,20,21,25,27-31,32- 50,61-70	2,5,25,27,31,34 37,39,44,45,47 48,61,65,66 4 <sup>th</sup> Week
Chapter 1 Functions and Models	1.2 Mathematical Models (1 Lecture)	Polynomials, power, Rational, Algebraic, trigonometric, Exponential, logarithmic and transcendental functions	5,	2,4,8(f(x))	1,2,4,5,6,7,8,9,13	1,2,3,4,8,9 4 <sup>th</sup> Week
	1.3 New functions from old functions ( 2 Lectures)	Transformation, combination of functions	1-3,5-9	1,6	1-52 (even)	2,3,6,7,29,31,35 44,50,51,52 4 <sup>th</sup> Week
	1.5 Exponential functions (1 Lecture)	The number e	1-3	1,17	1-19	14-18 <sup>5th</sup> Week
	<b>1.6</b> Inverse functions and logarithms	Definitions, Logarithmic functions, natural logarithm, inverse trigonometric functions	1-13	25,26	1-69 (odd)	5,7,15,18,21,23 22,25,33,35,39 47,51,53,54,66 67,71
	(2 Lectures)					5 <sup>th</sup> Week

		Lectures				
Chapter Title	Section Title	Subtitle	Examples	Exercises	HW	Due date (end of)
	<b>2.2</b> The limit of a function (2 Lectures)	One side limits, infinite limits	1-10	4,8	2-20 (even), 25,27,28,29,31,32,33	5,6,7,9,10 17,21,27 <sup>6th</sup> Week
Chapter 2 Limits and	<b>2.3</b> Calculating limits using the limit laws ( 2 Lectures)		1-11	27,37	2-44(even),46- 51,55,56,60,61	1,2,8,12,15 18,20,21,22 25,29,35,39 42,46,55 6 <sup>th</sup> Week
Derivatives	2.5 Continuity ( 2 Lectures)		1-10	4,32,37	1-51(odd),55	3,9,29,30,34 38,41,42, 7 <sup>th</sup> Week
	<b>2.6</b> Limits at infinity; Horizontal asymptotes (2 Lectures)	Infinite limits at infinity	1-11		2-44(even), 47,48,57	3,4,15,19,21 23,25,27,33 34,41,43,44 57 7 <sup>th</sup> Week
	<b>2.7</b> Derivatives and rate of change ( 1 Lecture)	Tangents, velocities, derivatives, rate of change	1-6		3,4,5-8,9,11,12,17,18,19 21,23,25,30,31-37,40,51	3,5,7,11,14 18,21,26,31,33 38,41 8 <sup>th</sup> Week
	<b>2.8</b> The derivatives as a function (1 Lecture)	Other notation, how can a function fail to be differentiable ?, higher derivatives	1-7		1-53(odd),52,54	1-11,18,19 35-38,41-44 46,52 8 <sup>th</sup> Week

		Lectures				
Chapter Title	Section Title	Subtitle	Example s	Exercises	HW	Due date (end of)
	<b>3.1</b> Derivatives of Polynomials and Exponential Functions (2 Lectures)	The power rule, The sum rule, Exponential functions, Derivative of the natural exponential function	1-9	20,24	3-32,33,35,38,39,42, 45,48,51,54,67,68,70 75	3,7,9,10,19 22,23,27,33 35,38,39,45 51,54,67,70 9 <sup>th</sup> Week
Chapter 3 Differentiation Rules	<b>3.2</b> The Product and Quotient Rules (1 Lecture)	The product rule, The quotient rule	1-5		3-26, 30,32,34,43 41-50	1,4,7,11,14,15,25, 27,31 33,43,4748 9 <sup>th</sup> Week
	<b>3.3</b> Derivatives of Trigonometric Functions (1 Lectures)	Derivatives of Trigonometric Functions	1,2,4,5,6		2-50 (Even)	5,7,9,15,34,41,43, 47,48 10 <sup>th</sup> Week
	<b>3.4</b> The Chain Rule (2 Lectures)	Derivative of a Composite Function, The Power Rule Combined with the Chain Rule, The Chain Rule with Powers of a Function	1-9	9,13,18,40	2,5,9,26,36-42,44- 46,53,55,56	4,6,10,12,18,21,2 3,24,35,38,44,50 10 <sup>th</sup> Week
	<b>3.5</b> Implicit Differentiation (2 Lectures)	Implicitly Defined Functions, Derivatives of Inverse Trigonometric Functions, Rational Powers of Differentiable Functions,	1-5		1-6,11-18, 24-28	9,23,30- 32,39,45,48,50,52 -54 10 <sup>th</sup> Week
	<b>3.6</b> Derivatives of Logarithmic Functions (2 Lectures)	Logarithmic Differentiation, The Number e as a Limit	1-8	14,28	2-8,31-39	6-8,17-29, 43-49 11 <sup>th</sup> Week
	<b>3.9</b> Related Rates (1 Lecture)		2,4		15,16,20	

		Lectures				
Chapter Title	Section Title	Subtitle	Examples	Exercises	HW	Due date (end of)
	<b>4.1</b> Maximum and minimum values ( 2 Lectures)		1-10		3-7,9,13,16,26,28 29-44,46,47-62	15,19,26 28,29,34 35,37,38 39,48,54 59,60 12 <sup>th</sup> Week
Chapter 4 Applications of Derivatives	4.2 The Mean Value Theorem (1 Lecure)		1-6	7	2,4,5,8,11,13,15,16,1 7,20,23,25,29,33	3,4,9,10,1112,13, 14 23,24 12 <sup>th</sup> Week
	<b>4.3</b> How Derivatives Affect the Shape of a Graph ( 2Lectures)	What does f'(x) say about f(x)? What does f''(x) say about f(x)?	1-8	32	1-53(odd)	1,2,5-8,11 13,17,18 21,31,34,39 41,52 12 <sup>th</sup> Week
	<b>4.4</b> Intermediate Forms and L'Hôpital's Rule (2 Lectures)	Indeterminate products, differences, powers	1-9	53,56	1-63(odd)	2,7,10,15 21,29,43 48,49,55 63, 13 <sup>th</sup> Week
	4.5 Summary of curve sketching ( 1 Lecture)		1,5		9,14,19,25,37,50	
	<b>4.7</b> Optimization Problems (1 Lecture)	,Application to business and economics	1,5		5,6,9,10,11,13,16,19,30 33,35,36,37,46,47,53 55,66,73	3,5,13,17 33,44,45 13 <sup>th</sup> Week
	<b>4.9</b> Antiderivatives ( 1 Lectures)	Rectilinear motion	1-7		2-46(even),49-53 58-62(even)	1,4,5,6,10 11,15,24,36 39,40,50 13 <sup>th</sup> Week

Note:

- **1.** Instructor should cover all theoretical materials that related to the assigned examples.
- 2. All examples and exercises in the lectures part must be solved by the instructor.
- 3. All of the exams are Multiple Choices (MC).
- 4. Homework should be submitted online on or before the due date
- 5. Any student who misses 25% of the class will receive DN.
- 6. No Calculator will be allowed in any exam.

## **Marks distribution**

- 1. First Exam (90 Min; 30 Marks); Second Exam (90 Min; 30 Marks); Final Exam (120 Min; 40 Marks)
- 2. Bonus Marks will be given to students who submit all the HW online.