



King Abdul Aziz University
Department of Mathematics

Academic year 1436
2015

Math 110 (S & E) Syllabus / Term (2)
Book: Calculus Early Transcendentals by James Stewart 7th edition

		Lectures			
Chapter Title	Section	Theoretical (Definitions & Theorem)	Examples	Exercises	HW
Appendixes	Appendix A Numbers, Inequalities and Absolute Values	<ul style="list-style-type: none"> • Intervals (Table) • Inequalities • Absolute value Properties (1-6) 	4,7 Read 1,2,3,6,8		
	Appendix B Coordinate Geometry and lines	<ul style="list-style-type: none"> • Slope of line • Point-slope form of the equation of a line. 	4 Read 7,8	35	
	Appendix D Trigonometry	<ul style="list-style-type: none"> • Angles (convert formula) • Trigonometric functions • Trigonometric identities. • Graphs of the trigonometric functions (domain \$ range). 	1,4	4,30	1-12(odd) 29- 34(odd)

Ch1: Functions and Models	1.1 Four ways to represent a function	<ul style="list-style-type: none"> • Definition: Domain and Range of a (polynomial, absolute , rational, radical of first and second degree)Functions- see the workshop at rallehabi.kau.edu.sa • Graphs of Functions and vertical line test. • Piecewise defined functions. • Symmetry (Odd & even) functions. • Increasing and Decreasing Functions 	2,6,7,8,11 Read 1	9,31,33,3 4,76, 38,42,45.	7-10, 32- 34,43, 47,73-78
	1.2 Mathematical Models: A Catalog of essential functions	<ul style="list-style-type: none"> • Essential functions (Polynomials, power, rational, algebraic, trigonometric, exponential and logarithmic) 	5	2	1
	1.3 New functions from old functions	<ul style="list-style-type: none"> • Transformation of functions. i) Vertical and horizontal shifts. ii) Vertical and horizontal reflecting. • Combination of functions ($f \pm g$, $f \cdot g$, f/g, Composite Functions) and their domain. 	1,2,3(b) , 6-9	1(a-f)	29-37(odd) ,39 ,45
	1.5 Exponential Functions	<ul style="list-style-type: none"> • Laws of Exponents • The Number e. 	1	2,13,14,1 9,20	1,3,17
	1.6 Inverse Functions and Logarithms	<ul style="list-style-type: none"> • Definition1: (1-1) & horizontal line text. • Definition 2: Inverse Functions. • How to find the inverse function. • Logarithmic functions • Natural logarithm. • Graphs and growth of natural logarithm • Inverse of Trigonometric Functions 	1,2(by graphs) 4-13 Read 3,6	22,23, 37(b),40, 48(a),51(a,b), 53(a), 57, 64.	21-26(odd) 35-41(all) 52
Ch2: Limits and derivatives	2.2 The Limits of a Functions	<ul style="list-style-type: none"> • Definition1-6 • Fig17 • One-sided limits • Infinite limits (vertical asymptote)+limit of trigonometric function(by theorem)* • 	1 , 7-10	12 35,38	4,8,11
	2.3 Calculating Limits Using the Limits Laws	<ul style="list-style-type: none"> • The Limits Laws • Theorem1,2 • The squeezed theorem. 	2(a)-9,11	15,23,28, 29,57	12, 19, 20,22,25, 27, 31, 32,35-37

	2.5 Continuity	<ul style="list-style-type: none"> • Definition1: Continuity at A number. • Definition2: Continuity from the right and from the left • Definition3: Continuity on an interval. • Theorem4-10 	2(a-c),4,6,8,9,10 Read 5,7	46	17,20,21,25,38,41,45
	2.6 Limits at infinity	<ul style="list-style-type: none"> • Definition1-3 • Infinite limits at infinity • Theorem • Lim_{x->∞} (axⁿ) if n odd or even 	1-11	34,43	19,26,33,35,43,44
	2.7 Derivatives and rates of change	<ul style="list-style-type: none"> • Tangents • Definition1-2 • Derivatives • Definition 4 	1,4,5		
	2.8 The Derivatives as a Function	<ul style="list-style-type: none"> • Formulas 1,2 • Definition 3,Theorem 4 • Higher Derivatives 	3,5,7		29,49
	3.1 The Derivative of polynomials and exponential function	<ul style="list-style-type: none"> • Constant functions • Power functions • New derivatives from old • Exponential functions 	1-6,8	23	3-35(odd)
Ch3: Differentiation Rules	3.2 The product and quotient rules	<ul style="list-style-type: none"> • The product rule Quotient rule 	1-5		3-33(odd)
	3.3 Derivatives of Trigonometric Functions	Derivative of Sine Function, Derivative of Cosine Function, Derivative of other Basic Trigonometric Function.	1,2(diff.only),4-6	21,40,46,42,45,47,48	1-7(odd),39,49
	3.4 The Chain Rule and Parametric Equations	The Chain Rule.	1-9	33,53	1-15(odd),44,47,48
	3.5 Implicit Differentiation	Implicit Differentiation, Derivatives of Higher Order, Derivatives of Inverse Trigonometric Functions.	1, 2(a,b)-5,	12,26	5-11(odd),25,35,37,49,55

	3.6 Derivatives of Logarithmic Functions	<ul style="list-style-type: none"> • Derivatives of Logarithmic Functions 	1-8	19,52	3-17(odd),31,43-47
Ch4: Applications of Differentiation	4.1 Maximum and Minimum Values	<ul style="list-style-type: none"> • Definition1,2,6 • Extreme Value Theorem , Critical Number. 	4,7,8 Read 2,3	4	5,29,47,53
	4.2 The Mean Value Theorem.	<ul style="list-style-type: none"> • Rolle's Theorem, The Mean Value Theorem. 	3	1 ,12	1,13
	4.3 How derivatives affect the shape of a graph	<ul style="list-style-type: none"> • Increasing/decreasing test • Monotonic Function and Concavity, First and second derivative Test • Test for Concavity. • Definition: inflection point 	1,2,6 Read 7	12	9,19

Marks distribution :- First Exam (120 min; 33 marks); Second Exam (120 min; 33 marks); Final Exam (120 min; 44 marks);

Note

Appendices A&B are not included in the exams.

Exam1 will held on the week 10-5-1436H from Appendix D, sec.1.1-end of sec.1.5.

Exam2 from sec.1.6-end of sec.2.8.+P192,193,198 on the first week of 30/6/1436

Final exam: All chapters on 28/7/1436

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