

SYLLABUS AND CONTENTS OF MATH 101 (1445 H)

Course Name: Differential Calculus

Credit Hours: 3 hours

Course Number: Math 101

Actual Hours: 5 hours

Prerequisite: ---

Semester:

First Semester

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Textbook:

Differential Calculus, Fourth Edition, 2019

Authors:

Ibraheem Aloyan, Nasser Bin Turki, Tahsin Ghazal, Obaid Al-Gahtani and Khaled Khashan

References:

- Swokowski, E, W; Olinick, M; Penece, D. Calculus, Sixth Edition, PWS Publishing Company, 1994.
- Larson, R & Edwards, R. **Calculus**, Tenth Edition, Cengage Learning, 2014.
- Anton, H; Bivens, I & Davis, S. **Calculus Early Transcendentals**, Ninth Edition, Wily & Sons, 2009.

Evaluation:

The evaluation of the students will be continuous during the course and depends on the following:

Mid Term Exam	25
Activities	5
Two Home works(Paper)	5+5
Four Online Home works	10
Final Exam	50

تعليمات مهمة:

١. الخطة التي بين أيديكم أبنائنا الطلاب هي خطة مختصرة تتضمن الأشياء المهمة في المقرر. الخطة التفصيلية وكل ما يتعلق بالمقرر موجود على موقع السنة الأولى المشتركة على الرابط:

<https://cfy.ksu.edu.sa/ar/node/1196>

٢. يحتسب الغياب منذ اليوم الأول من الفصل الدراسي إلى آخر يوم قبل الاختبارات النهائية.

٣. في حال تأخر الطالب عن المحاضرة عشر دقائق يعتبر غائبا، وفي حالة حضوره خلال العشر دقائق الأولى يسجل متأخرا.

٤. يحرم الطالب من المقرر إذا تجاوزت غيابه ٢٥% من ساعات الحضور.

Course Schedule and Contents:

Chapter	Weeks	Section	Lecture	For Students	
Chapter One	1-4	<ul style="list-style-type: none"> - Solve Linear Equations. - Solve Quadratic Equations (Factoring, Quadratic Formula). - Adding and Subtracting of Algebraic Fractions. - Expansion of Square and Cubic Brackets. - Difference between Two Squares. - Difference and Sum of Two Cubes. - Simplify by Common Factor. 			
		1.1 Sets of Numbers and Inequalities	Example: 1.1.2 Related Problem: (1,2,3(a,b,d,e)) Exercise: (13,17,19)	Exercise: 1,4,5,7,8,10,11,12 ,21,23	
		1.2 Functions	Related Problem: (2,4,5,6,7) Exercise: (20,44,46,60,69)	Exercise: 4,8,9,10,11,12,13,14,15,17,18 ,23,24,30, 31,32,57,58,59,61,62,64,66,68	
		1.3 Inverse Functions	Remark page 31 Example: 1.3.1 Related Problem: (2,3,4,5) Exercise: (1,2,3,4,5)	Exercise: 8,9,11,12,13,15,16,17,32,33,34 35 ,37,38,39,41,42	
		1.4 Trigonometric Functions and Their Inverses	Example: (1.4.7, 1.4.10) Related Problem: (1,2,3,4,6,8,9) Exercise: (27,32,38,39,41)	1,3,5,6 ,7,9,11,12,13,14,16,17,18,19,20,21,23,25,28,29,30 ,35, 40, 42,43,44,48,49,50	
Chapter Two Limits and Continuity	4-8	2.1 Definition of Limit	Example: (2.1.1, 2.1.2 and 2.1.3) Exercise (from 12 to 26)	Exercise: 2,9,11	
		2.2 Limits Laws	Example: (2.2.5, 2.2.10) Related Problem (2,4,5,6,7) Exercise (35,38,64,66, 72, 73, 75) Remark page 90	Exercise: 1,2,7,11,13,14,16,19,21,26,27,29,30,31,34, 35,37,40,41,43,47,48,49,51,53,54,55,57,63,71.	
		2.3 Limits Involving Infinity	Example: 2.3.1 Related Problem: (1,2,3,4,5) Exercise (1-9) Exercise (57,58)	Exercise: from 10-to-18,20,21,22,24,25,26,28,32,35,36,37,38,41, 44,45,47,52,54,55,60,61	
		2.4 Continuity of Functions	Example: (2.4.1, 2.4.12) Related Problem: (1,2,3,4,5,6,7,9) Exercise (27,51, 52,53,57)	Exercise: 1,2,3,4,7,8,12,13,16,18,19,22,29,30, 32,34,40,47,55,56,60	
Chapter Three Differentiation	9-11	3.1 The Derivative and the Tangent Line Problem	Example: (3.1.7) Related Problem: (1,3,4,9) Exercise: (8,24,25,30, 31) Proof of Theorem: 3.1.1	Examples: 3.1.6 Related Problem (6) Exercise: 2,6,10,13,15,21	

		3.2 Differentiation Rules	Use the Remark page 166 (give an example) Related Problem: (1,2,3,4,5,6,7) Exercise: (31,44)	Examples: 3.2.2 (b and c) Exercise: 1,4,5,8,12,14,16,17,18,19,23,24,26,28,37,38,40
		3.3 Derivatives of Trigonometric functions	Related Problem (1,2,3,4,5) Proof of Theorem (3.3.1) (b)	Examples: 3.3.6 Exercise: 1,3,5,7,10,11,13,16,19,20,21,23,27
		3.4 The Chain rule	Related Problem (1,2,3,5,6,7,8,9)	Examples: 3.4.4 Exercise: 2,5,6,8,9,11,12,13,15,16,20,21,26,27,29,30,34,38,39,40,47
		3.5 Implicit Differentiation	Related Problem (1, 2, 3)	Examples: 3.5.4 Exercise: 1,2,3,4,5,8,12,13,14,15,17,19,20,23,26
		3.6 Higher Order Derivatives	Example: (3.6.6, 3.6.7) Related Problem (1,2,3,5,6) Exercise: 40	Examples: 3.6.4 Exercise: 1,4,6,7,10,12,13,14,16,18,19,22,23,26,27,29,32,34,35,37,38,42,44,43
		3.7 The Derivative of Inverse Functions	Related Problem (2,3) Exercise: (5,12)	4,7,8,11,13,15,17,23
Chapter Four Applications of Differentiation	11-14	4.1 Extrema of Functions	Example: 4.1.1, 4.1.3 Related Problem: (1,2(a, b, c),3(a, b, c)) Exercise: (1,2,3,4)	Examples: 4.1.4(e,f), 4.1.6 and 4.1.7 Exercise: 5,6,8,10,16,23,24
		4.2 The Mean Value Theorem	Related Problem: (1,2) Exercise: (1,2,3,4,14, 19,23)	5,6,7,11,13,15,17,21,24,26
		4.3 Increasing and Decreasing Functions	Example: 4.3.8 Related Problem (2,3(a),4(a)) Exercise: (1,2,3,4,5,6,37,38)	Examples: 4.3.5, 4.3.7 Exercise: 7,11,13,15,21,22,27
		4.4 Concavity	Example: 4.4.4 and 4.4.5 Related Problem: (1(a, b), 2(a)) Exercise: (1,2,3,4,5,6,7,8,9,10, 11,47,49)	Examples: 4.4.8 Exercise: 12,19,25,28,32,36,44
		4.5 Curve sketching	Example: (4.5.1) Related Problem: (2) Exercise: (5,22)	Exercise: from 1 to 9, from 15 to 20,23, 25