

## SYLLABUS AND CONTENTS OF MATH 101 (1444)

**Course Name:** Differential Calculus

**Credit Hours:** 3 hours

**Course Number:** Math 101

**Actual Hours:** 6.15 hours

**Prerequisite:** ---

**Course Coordinator:** Dr. Amr Abdulaty

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**Semester:** First Semester 1444

### Instructor Information

**Instructor** .....

**Office** .....

**E-mail** .....

**Office Hours** .....

### Textbook:

Differential Calculus, Fourth Edition, 2019

### Authors:

Ibraheem Alolyan, 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
One Home work(Paper)	10
Online Home works	10
Final Exam	50

### تعليمات مهمة:

١. الخطة التي بين أيديكم أنبأنا 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 غائباً، وفي حالة حضوره خلال العشر دقائق الأولى يسجل متأخراً.

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

Course Schedule and Contents:

Chapter	Weeks	Section	Lecture	For Students
Chapter One	1	1.4 Trigonometric Functions and Their Inverse	Example: 1.4.10 Related Problem (1, 2, 3, 4, 5, 6, 9) Exercise (38, 39)	1,3,5,6 ,7,9,11,12,13,14,16,17,18,19,20,21,23,25,35, ,40, 41,44,48,49,50
Chapter Two Limits and Continuity	2-4	2.1 Definition of Limit	Example: 2.1.1, 2.1.2 and 2.1.3 Exercise (12-17) Exercise (18-26)	Exercise: 3,8,11
		2.2 Limits Laws	Example: 2.2.3, 2.2.10 and 2.2.11 Related Problem (2, 3, 4, 7) Exercise (38, 61, 64, 72, 73, 74)	Exercise: 1,2,7,11,13,14,16,19,21,26,27,29,30,31,34, 35,37 ,40,41,43,48,49,53,54,55,57,63,71.
		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, 44,52,54,55,60,61
		2.4 Continuity of Functions	Examples: 2.4.1 and 2.4.12 Related Problem (1, 3, 4, 5, 6, 7, 9) Exercise (26, 51, 52, 53)	Exercise: 1,2,3,4,7,8,12,13,16,18,19,22,27,29,30, 32, 34,47 ,60
Chapter Three Differentiation	5-7	3.1 The Derivative and the Tangent Line Problem	Related Problem (1, 3, 4, 5, 8, 9) Exercise (30, 31)	Examples: 3.1.6 Related Problem (6) Exercise: 2,6,8,10,13,15 ,21,24
		3.2 Differentiation Rules	<b>Use the Remark (give an example)</b> Related Problem (1, 2, 3(a, b), 4, 5, 6, 7)	Examples: 3.2.2 (b and c) Exercise: 1,4,5,8,12,14,16,17,18,19,23,24,26,28, 38,40
		3.3 Derivatives of Trigonometric functions	<b>Proof of Theorem</b> (3.3.1) (b) Related Problem (1, 2, 3, 5)	Examples: 3.3.6 Exercise: 1,3,5,7,10,11,13,16,19,20,21,23,25,27
		3.4 The Chain rule	Related Problem (2, 3, 6, 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

		<b>3.5</b> 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
		<b>3.6</b> Higher Order Derivatives	Example: 3.6.7 Related Problem (1, 2, 3, 6)	Examples: 3.6.4 and 3.6.6 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
		<b>3.7</b> The Derivative of Inverse Functions	Related Problem (2, 3)	4,7,8,11,12,13,15,17
<b>Chapter Four Applications of Differentiation</b>	8-10	<b>4.1</b> Extrema of Functions	Example 4.1.1 and 4.1.2 Related Problem (1, 2(a, b, c), 3(a, b, c) Exercise (23)	Examples: 4.1.4(e, f), 4.1.6 and 4.1.7 Exercise: 1,2,5,6,8,10,16,24
		<b>4.2</b> The Mean Value Theorem	Related Problem (1, 2) Exercise (14, 19)	2,3,5,6,7,11,13,15,17,21,23
		<b>4.3</b> Increasing and Decreasing Functions	Related Problem (2, 3(a), 4(a)) Exercise: 1 to 4	Examples: 4.3.5, 4.3.7 Exercise: From 5 to 7,11,13,15,21,22,27,28,38
		<b>4.4</b> Concavity	Example: 4.4.4 and 4.4.5 Related Problem (1(a, b), 2(a))	Examples: 4.4.8 Exercise: From 1 to 12,19,25,28,32,36,37,44,47,49
		<b>4.5</b> Curve sketching	Example 4.5.1 and 4.5.2	Exercise: from 1 to 9, from 20 to 23, 25, 32
		<b>4.6</b> Optimization problems	Example 4.6.1 and 4.6.4	Exercise: 3, 6