

**SYLLABUS AND CONTENTS OF MATH 101 (1447 H)**

**Course Name:** Differential Calculus

**Credit Hours:** 3 hours

**Course Number:** Math 101

**Actual Hours:** 5 hours

**Prerequisite:** ---

**Semester:**

**Second Semester**

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**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 + Tutorial (Class work)	(2+13=15)
Two Home works(Paper)	10
Final Exam	50

## تعليمات مهمة:

1. يحتسب الغياب منذ اليوم الأول من الفصل الدراسي إلى آخر يوم قبل الاختبارات النهائية.
2. في حالة تأخر الطالب عن 5 دقائق، يسجل متأخرًا.
3. يتم احتساب كل مرتين تأخير، بمرّة واحدة غياب.
4. يحرم الطالب من المقرر إذا تجاوزت غيابه 25% من ساعات الحضور.

## Course Schedule and Contents:

Chapter	Weeks	Section	Lecture "Teacher"	Exercises
Chapter One	1-4	1.1 Sets of Numbers and Inequalities	Example: (1.1.1), (1.1.2), Exercise: (7) Example: (1.1.4) (except c, d),	1,3,5,6,16,19,23
		1.2 Functions	Example: (1.2.3), (1.2.4), (1.2.5), (1.2.10), Exercise: (20,59)	14,17,19,23,26,48,54,57,58,63,67
		1.3 Inverse Functions	Related Problem:(2) Example: (1.3.4), (1.3.5) Exercise: ((1,2,3),38) <b>Remark page 31 (<math>a \neq 0</math>)</b>	9,13,15,16,33,41,42
		1.4 Trigonometric Functions and Their Inverses	Example:(1.4.1), (1.4.2), (1.4.3), (1.4.4), (1.4.5), (1.4.6), (1.4.7), (1.4.8), (1.4.9), and (1.4.10)	2,4,5,8,9,12,14,16,17,18,21,27,29,37,44,52

Chapter Two Limits and Continuity	5-8	2.1 Definition of Limit	Example: (2.1.1), (2.1.2) Exercise (from 12 to 17)	2,3,8,10
		2.2 Limits Laws	Example: (2.2.3), (2.2.5), (2.2.6(except {d})), (2.2.7 {a}), (2.2.8), (2.2.9), (2.2.11) (except f), Related Problem: (6 {d, f}) Exercise (73) Example: (2.2.12) <b>Remark page 90</b>	7,11,13,26,29,30,41,49,54,55,63,66,75
		2.3 Limits Involving Infinity	Example: (2.3.1), (2.3.5), Example: (2.3.8), (2.3.9) Exercise (8, 9), 24,53)	19,20,25,45,48
		2.4 Continuity of Functions	Example: (2.4.1), (2.4.2), (2.4.4), <b>Remark page 131</b> Example: (2.4.6), (2.4.8), (2.4.11) Exercise (28)	1,5,7,12,18,29,30,32,34,40,58
Chapter Three Differentiation	9-12	3.1 The Derivative and the Tangent Line Problem	Example: (3.1.4), (3.1.6), (3.1.7),3.1.8), Example: (3.1.9) ( <b>Use Remark page 153</b> ) Exercise: (30)	2,6,8,10,13,15,21,23
		3.2 Differentiation Rules	Example: (3.2.1 {a, b, c}), (3.2.2 {b, c}), <b>Use Remark page 166(give an example)</b> Example: (3.2.3 {b}), (3.2.4) (b), (3.2.5) Exercise: (44)	1,4,5,14,16,17,23,24,29,41
		3.3 Derivatives of Trigonometric functions	Example: (3.3.1), (3.3.2),(3.3.3), (3.3.5)	1,5,7,10,11,13,16,19,20,21,23
		3.4 The Chain rule	Example: (3.4.2), Exercise: (20) Example: (3.4.6) (a, c),	2,5,6,8,11,12,15,16,19,29,34,38,47
		3.5 Implicit Differentiation	Example: (3.5.1), (3.5.2)	1,2,3,4,5,8,9,12,13,14,19,20,23,26
		3.6 Higher Order Derivatives	Example: (3.6.1) Related Problem: (2,3) Example: (3.6.7)	1,4,6,7,10,12,13,14,16,18,19,22,23,26,27,29,32,34,35,37,38
		3.7 The Derivative of Inverse Functions	Example: (3.7.2) Exercise: (14)	6,7,11,15,16,17,23

<b>Chapter Four Applications of Differentiation</b>	12-14	<b>4.1</b> Extrema of Functions	Example:(4.1.1), (4.1.4 except {g}), (4.1.5) Exercise: (24)	1-4,6,7,11,16,17
		<b>4.2</b> The Mean Value Theorem	Example: (4.2.1), (4.2.4) Exercise: (1,2)	6,7,21,24,26
		<b>4.3</b> Increasing and Decreasing Functions	Example: (4.3.3), (4.3.4) Related Problem:(3 {a}) Example: (4.3.6) Exercise: (4,5)	1,3,7,11,13,15,26,38
		<b>4.4</b> Concavity	Example: (4.4.1),(4.4.2), (4.4.5), (4.4.6) Related Problem: (2 {a}) Exercise: (5 to 9), (47)	12,25,28,36,48
		<b>4.5</b> Curve sketching	Example: (4.5.1), (4.5.2) Exercise: (3)	4,5,19