KING SAUD UNIVERSITY
PREPARATORY YEAR DEANSHIP
BASIC SCIENCE DEPARTMENT

SYLLABUS AND CONTENTS OF MATH 150 (1436/1437)

Course Name: Calculus
Course Number: Math 150
Prerequisite: Precalculus (Math 140)

Credit Hours: 3 hours
Actual Hours: 4 hours

Course Coordinator: Dr. Mahmoud AlKhateeb **Phone:** 94683
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Semester: Summer Semester 1436-1437

Instructor Information

Instructor …….. **Office** ……..
E-mail …….. **Office Hours** ……..

Textbook:
Calculus Made Simple, Second Edition, 2015

Authors:
Dr. Khaled Khashan, Dr. Ayman Khashan, Dr. Sofian Obeidat

References:

- Anton, Bivens, Davis: Calculus: Early Transcendentals Combined, 8th Edition, 2005.
- Salas, Hill, Etgen. Calculus: One and Several Variables, 9th Edition, 2003.

CONTENTS:

Limits and Continuity of Functions: Concept of Limit, Computation of Limits, Infinite Limits, Limits at Infinity, Continuity and Consequences, Limits of Trigonometric Functions.

Derivatives of Functions: The Derivative, Computation of Derivatives, The Chain Rule, Derivatives of Trigonometric Functions, Derivatives of Logarithmic and Exponential Functions, Implicit Differentiation, The Mean Value Theorem.

Applications of Derivatives: Indeterminate Forms and L'Hopital's Rule, Monotonic Behavior of Functions, Concavity and Inflection Points, Absolute Extrema, Optimization, Curve Sketching.

GOALS

In this course the student will:

- Define and apply the properties of limits of functions.
- State the definition of continuity and determine where a function is continuous or discontinuous.
- Find the derivative of an algebraic function by using the definition of a derivative.
- Apply formulas to find the derivative of algebraic, trigonometric, exponential, and logarithmic functions and their inverses.
- Apply formulas to find the derivative of the sum, product, quotient, inverse, and composite (chain rule) of elementary functions.
- Find the derivative of an implicitly defined function.
- Find the higher order derivatives of algebraic, trigonometric, exponential, and logarithmic functions.
- Use logarithmic differentiation as a technique to differentiate non logarithmic functions.
- State (without proof) the Mean Value Theorem for derivatives and apply it both algebraically and graphically.
- Use L'Hopital's rule to find the limit of functions whose limits yield the indeterminate forms.
- Apply the derivative to solve problems, including tangent and normal lines to a curve, curve sketching, velocity, acceleration, related rates of change, and optimization problems.

Evaluation:

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

Mid Term Exam	30	
Quizzes & Activities	10	(4 Quizzes)
Home works	10	(4 home works)
Final Exam	50	

Course Schedule and Contents:

Chapter	Week	Section	Examples	Exercises for Students
Chapter one Limits and Continuity of Functions	Week 1	**1.1** Concept of Limit	2,4,6,7	1,9,10,11,12,22,25,28
		1.2 Computation of Limits	1,2,3,4,5,6,7,8,9.10,12,13, 16,17	9,16,23,24,25,26,31, 33,36,38,42,53,54,57
	Week 2	**1.3** Infinite Limits	1,2,3,4,5,6,7,8,9	1,4,5,6,9,11,17,18,19, 21,22
		1.4 Limits at Infinity	1,2,3,5,7,8,9,10,11,13	1,2,4,5,7,8,10,12
		1.5 Continuity and Consequences	1,3,5,6,7,9,14,19, 21	1,14,16,20,25,27,30,3 3,41,43,49,51
	Week 3	**1.6** Limits of Trigonometric Functions	1,2,3,4,5,7,8,9,11,12,13 ,EXE 10	2,8,9,11,12 ,16, 20,23
Chapter Two Derivatives of Functions		**2.1** The Derivative	1,3 ,6 ,11,12	1,3,5,7,8,11,13,15,18, 19,25
		2.2 Computation of Derivatives	1,2,3,4,5,6,9,10,13,14,15, 16,17	1,3,5,11,17,18,19,20, 21,22,23,24,25,26,27, 32,34,35,38
	Week 4	**2.3** The Chain Rule	1,3,6,7,8,9,10	1,3,9,11,13,18,24,26, 28, 29,30,33,34,37
		2.4 Derivatives of Trigonometric Functions	1,2,3,4,5,6,7,8,10	1,5,8,12,13,16,28,29, 33,36,38,39,45,47,51
		2.6 Derivatives of Logarithmic and Exponential Functions	1,2,3,4,5,6,7	1,3,5,8,11,15,20,23,26 ,28,30,35,39,41
	Week 5	**2.7** Implicit Differentiation	1,3,4,5,7,8	2,3,9,11,15,19,21,23, 25,26,30,34,37,38
		2.8 The Mean Value Theorem	1,3,6	3,5,7,11,12,15,16
Chapter Three Applications of	Week 6	**3.1** Indeterminate Forms and L'Hopital's Rule	4,5,6(1,3),7	1,2,3,4,5,7,13,15,16, 17,19,25,27,28,29,30, 31,34

Chapter	Week	Section	Examples	Exercises for Students
Derivatives		**3.2** Monotonic Behavior of Functions	1,2,3,4,5,6,7,8,9,10	1,2,3,4,5,6,8,9,11,15, 18,19
		3.3 Concavity and Inflection Points	1,2,3,4	1,2,3,4,5,6,7,8,11,13, 19,20,22,26
	Week 7	**3.4** Absolute Extrema	1,2,3,6,7,10	1,2,3,4,18,19,21
		3.5 Optimization	1, 2, EXE 8, EXE 9	1,2,3
		3.6 Curve Sketching	1,3,4,6	1,6,8,22,23

تعليمات مهمة:

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

http://py.ksu.edu.sa/ar/node/1053

يوجد فيديوهات تعليمية مرافقة لجميع وحدت المقرر تتضمن شرحا تفصيليا يقدمه مدربون متميزون من القسم. وهي فيديوهات مهمة جداً تساعدك على تعميق فهمك للمادة. الفيديوهات التعليمية موجودة على الرابط:

http://py.ksu.edu.sa/ar/node/1055

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

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

يحرم الطالب من المقرر إذا تجاوزت غياباته 25% من ساعات الحضور.