اعتماد
NCAAA

VISION
2030
المملكة العربية السعودية
KINGDOM OF SAUDI ARABIA

هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission

Course Specifications

Course Title:	**Calculus**
Course Code:	**150 Math-4**
Program:	**Preparatory Year**
Department:	**Basic Sciences**
College:	**Deanship of Preparatory Year**
Institution:	**Najran University**

Table of Contents

A. Course Identification

1. Credit hours:	**4**

2. Course type

a.   University ☐   College ☐   Department ☑   Others ☐

b.   Required ☑   Elective ☐

3. Level/year at which this course is offered: **Second Level**

4. Pre-requisites for this course (if any)**: none**

5. Co-requisites for this course (if any)**: none**

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**		**80**
2	**Blended**		
3	**E-learning**		**20**
4	**Correspondence**		
5	**Other**		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	**Lecture**	**45**
2	**Laboratory/Studio**	
3	**Tutorial**	**30**
4	**Others** (specify)	
	Total	**75**
Other Learning Hours*		
1	**Study**	**45**
2	**Assignments**	**60**
3	**Library**	**15**
4	**Projects/Research Essays/Theses**	
5	**Others** (specify)	**30**
	Total	**150**

* The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

B. Course Objectives and Learning Outcomes

1. Course Description

This course is designed to cover the Differential Calculus. It includes limits, continuity, derivatives, and the applications of derivatives. The types of functions studied include algebraic, trigonometric, exponential and logarithmic.

2. Course Main Objective

Students are expected to have strong and sound understanding of the differentiation calculus in term of its concepts, techniques and theorems. Students are expected to apply them on studying the behavior of a function.

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge:**	
1.1	Define the limit and the continuity of a function, and its derivative on the real numbers.	
1...		
2	**Skills :**	
2.1	Evaluate the limits of a function, as x approaches to any real number a.	
2.2	Determine the continuity of a function either at a point or on an interval.	
2.3	Find the derivative of functions (in 1st degree, or high degree).	
2.4	Apply the derivative of functions for studying the behavior of functions and sketching their curves.	
2.5		
3	**Competence:**	
3.1		
3.2		
3.3		
3.4		
3.5		

C. Course Content

No	List of Topics	Contact Hours
1.	**Limits and Continuity**	
2.1	Definition of Limits	5
2.2	Limits Laws	5
2.3	Limits Involving Infinity	5
2.4	Continuity of Functions	5
2.	**The Derivative**	
3.1	The Limit definition of derivative & the Tangent Line Problem	5
3.2	Differentiation Rules	5
3.3	Derivative of Trigonometric Functions	5
3.4	The Chain Rule	5
3.5	Derivative of Logarithmic and Exponential Functions	
3.6	Implicit Differentiation	5
3.7	Higher Order Derivatives	5
3.8	The Derivative of Inverse Functions	
3.	**Application of Derivative**	
4.1	The Mean Value Theorem	5
4.2	Extreme Values of Functions	5
4.3	Monotonic Behavior of Functions	5

4.4	Concavity and the Inflection Points	5
Total		**75**

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes		Teaching Strategies	Assessment Methods
1	**Knowledge:**			
1.1	Define the limit and the continuity of functions, and its derivatives on the real numbers system			
1...				
2	**Skills :**			
2.1	Evaluate the limits of a function, as *x approaches* to *any real number a.*		- Lecture - Cooperative learning - Problem solving - Brain storming - Self-Learning	Midterm Exams Final Exam
2.2	Determine the continuity of a function either at a point or on an interval.			
2.3	Find the derivative of functions (in 1st degree, or high degree)			
2.4	Apply the derivative of functions for studying the behavior of functions and sketching their curve.			
2.5				
2.6				
3	**Competence:**			
3.1				
3.2				

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	1st midterm Exam	7th week	20
2	2nd midterm Exam	11th week	20
3	Assignments & Quizzes	During classes	10
4	Final Exam	At the end	50

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

- Office Hours
- Blackboard

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	• Differentiation Calculus, Ibraheem Alolyan, et al , The King Saud University, 3rd Edition Year: 2018.
Essential References Materials	• Anton, H; Bivens, I & Davis, S. Calculus Early Transcendentals, Ninth Edition, Wily & Sons, 2009. • Thomas, Calculus, Pearson Education , Addison Wesley, 2004.
Electronic Materials	• https://www.ck12.org/book/CK-12-Calculus-Concepts/section/1.7/ • https://zr9558.files.wordpress.com/2013/10/thomas_-calculus.pdf
Other Learning Materials	

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Classroom
Technology Resources (AV, data show, Smart Board, software, etc.)	Data Show – Smart Board Free software as (Geogebra) https://www.geogebra.org/graphing
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	No need

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching and assessment	Students	Questioner (Indirect)
achievement of course learning outcomes	Program Leaders	Software (Direct)
Quality of learning resources	all	Questioner (Direct)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

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Council / Committee	Dr. Khalid Abd elrazig Awad Allah Elnour	
	Dr. Haroun Doud Suliman Adam	
	Dr. Akram Abdulbagi Moh. Naji	
Reference No.		
Date	07 – 01 – 2019	