University of Telafer
College of Basic Education
Department of Mathematics
Second Grade
Subject: Advanced Calculus
First Studying Course

Republic of Iraq

Ministry of Higher Education
and Scientific Research

Description of the Teaching Course

Academic Member Name	Huda E. Khalid
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The Scientific Qualification	Doctoral Degree in Mathematics
The Scientific Title	Full Professor
The Affiliation	Telafer University / The Presidency of the University
The Course Aim	The concept of differentiation is introduced to the students taking into consideration the laws of derivation for the ordinary functions of one variable, trigonometric functions and their inversions, the exponential functions, the logarithmic functions, the hyperbolic functions and their inversions, as well as, introduce the concept of implicit derivation of functions with two variables. The geometrical interpretation and the physics interpretation for the calculus and some applied problems.
The Syllabus	▪ A review for the derivatives' laws, and add the definitions of the trigonometric functions and the inverse of trigonometric functions with their derivatives. ▪ Studying the functions $f(x;y)\ in\ R^{\text{٢}}$. ▪ The concept of continuity and limits of functions in $R^{\text{٢}}$. ▪ Studying the graphing of the function $f(x;y)$. ▪ Using the Calculator as an auxiliary tool for graphing the functions of the type $y=\ln x$,$y=e^{x}$, $y=\sin x$, as well as other additional quadratic examples, and cubic examples. ▪ A special study for the derivatives of the functions $y=\sinh x$, $y=\cosh x$, $y=\operatorname{sech} x$,…etc.
Textbook	Introduction Analysis The Theory of Calculus/ J. A. Fridy
Additional Auxiliary Books and resources	❖ **Internet** ❖ **Schaum's Series of Calculus** ❖ **Noor digital library** https://www.noor-book.com/
Evaluations	**The first term exam is of 15% marks** **The second term exam is of 15% marks** **The term exam is the summation of the above two exams = 30% marks** **The final exam is of 70% marks**
General Notes	**The weekly studying hours = 4 hours** **The units of this course subject = 3.5** **Lectures are given in the classrooms /Building of the Mathematical Department / College of Basic Education / Telafer University Campus**

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No.	Weekly order	The Syllabus
1	First	A review for the derivatives' laws, and add the definitions of the trigonometric functions and the inverse of trigonometric functions with their derivatives.
2	Second	Solve some examples on the subject (A review for the derivatives' laws, and add the definitions of the trigonometric functions and the inverse of trigonometric functions with their derivatives).
3	Third	A review for the derivatives' laws, and add the definitions of the trigonometric functions and the inverse of trigonometric functions with their derivatives.
4	Fourth	A review for the derivatives' laws, and add the definitions of the trigonometric functions and the inverse of trigonometric functions with their derivatives.
5	Fifth	Solve some problems on the subject (A review for the derivatives' laws, and add the definitions of the trigonometric functions and the inverse of trigonometric functions with their derivatives)
6	Sixth	The concept of continuity and limits of functions in R^2.
7	Seventh	Solve some examples on the subject (The concept of continuity and limits of functions in R^2).
8	Eighth	Studying the graphing of the function $f(x;y)$.
9	Ninth	Solve examples on the subject (Studying the graphing of the function $f(x;y)$).
10	Tenth	Using the Calculator as an auxiliary tool for graphing the functions of the type $y=\ln x$,$y=e^x$, $y=\sin x$, as well as other additional quadratic examples, and cubic examples.
11	Eleventh	Using the Calculator as an auxiliary tool for graphing the functions of the type $y=\ln x$,$y=e^x$, $y=\sin x$, as well as other additional quadratic examples, and cubic examples.
12	Twelfth	A special study for the derivatives of the functions $y=\sinh x$, $y=\cosh x$, $y=\operatorname{sech} x$,...etc.
13	Thirteenth	A special study for the derivatives of the functions $y=\sinh x$, $y=\cosh x$, $y=\operatorname{sech} x$,...etc.
14	Fourteenth	A special study for the derivatives of the functions $y=\sinh x$, $y=\cosh x$, $y=\operatorname{sech} x$,...etc.