



AL IMAM MOHAMMAD IBN SAUD ISLAMIC UNIVERSITY
COLLEGE OF ENGINEERING
DEPARTMENT OF CIVIL ENGINEERING

Course Information		
Course Code, Number & Name	MATH 105 Calculus I	Total Credit Hours: 4
Prerequisite/s	None	

Course Description
Differential calculus and basic Integral calculus including the fundamental theorem of calculus. It includes most of the elementary topics in the theory of real- valued functions of a real variable: limits, continuity, derivatives, maxima and minima, integration, area under a curve, volumes of revolution.

Textbook	
Title	<i>Calculus, Early Transcendental Functions</i>
Author	Robert T. Smith and Roland B. Minton
Publisher	McGraw-Hill
Year & Edition	2012, 4th edition.

Course Contents
Limits and Continuity: Review Preliminaries; Concept of Limit Computation of Limits; Continuity and its Consequences. Limits Involving Infinity.
Differentiation: The derivative, tangent lines and velocity Computation of Derivatives; The Power Rules; The Product and Quotient Rules; The Chain Rule; Implicit Differentiation Derivatives of Inverse Functions; Derivatives of Exponential and Logarithmic Functions; Derivatives of Trigonometric and Inverse Trigonometric Functions
Application of differentiation: First derivative test, Maximum and Minimum Values; Increasing and Decreasing Functions Concavity and the Second Derivative Test; Overview of Curve sketching. Linear approximation; Newton's method; Optimization.
Integral: Anti-derivatives; Indefinite Integral; Area. The Definite Integral; The Fundamental Theorem of Calculus; Area between curves. Indefinite Integral and Integration by Substitution, Area between curves. Volume: Slicing, Disks and Washers; Volumes by Cylindrical Shells. Arc Length; Area of Surface of Revolution.

Academic Coordinator

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