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

Course Information		
Course Code, Number & Name	MATH 106 Calculus II	**Total Credit Hours: 4**
Prerequisite/s	MATH 105 Calculus I	

Course Description
All techniques of integration (substitution, by parts, trigonometric substitutions, partial fractions, miscellaneous substitutions etc.), conic sections, polar coordinates, and infinite series. Vector analysis: Euclidean space, partial differentiation, multiple integrals, the integral theorems of vector calculus.

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

Course Contents
Integration Techniques: Integration by Substitution, Integration by Parts, Integration of Rational Functions Using Partial Fractions, Trigonometric Techniques of Integration, Improper Integrals.   **Applications of Definite Integrals:** Area between curves, Volumes by slicing, Volumes using Cylindrical Shells, Arc Length and Surface Area, Work, Moments and center of mass.   **Infinite Series:** Sequences of Real Numbers, Convergence and Divergence of Infinite Sequences, Infinite Series, Basic Infinite Series, Convergence Tests for Positive Series, Alternating Series, Absolute and Conditional Convergence, Power Series, and Taylor and Maclaurin Series.   **Functions of several variables and Partial Differentiation:** Functions of Several Variables, Limits and Continuity, Partial Derivatives, Differentiability, The Total Derivative, The Directional Derivatives and Gradient, Chain Rule, and Tangent Plane.   **Double and Triple Integrals.**   **Conic Sections and Polar Coordinates:** Conic Sections: The Parabola, Ellipse, and Hyperbola. The translation and rotation of axis. Parametric representation of curves in the plane, Polar Coordinates, and Calculus in Polar Coordinates.

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Academic Coordinator   **Official Stamp**