Applied Calculus (3)

Course Code	Course Num.	Course Name	Credit Hours	Lec	Lab	Tut	Prerequisites
MAT	**1114**	**Applied Calculus (3)**	**4**	**3**	**0**	**2**	**MAT 1113**

Syllabus:

Vectors in Plane and Space: Dot Product, Cross Product, Equations of Lines and Planes in Space.

Functions of Several Variables: Limits and Continuity, Partial Derivatives, Directional Derivatives, The Total Derivative, The Gradient of a Function, Tangent Plane and Linear Approximation, Chain Rule, Implicit Differentiation, Extrema of a Function.

Multiple Integrals: Double Integrals in Cartesian Coordinates, Polar Coordinates, Double Integrals in Polar Coordinates, Triple Integrals in Cartesian Coordinates, Cylindrical and Spherical Coordinates, Triple Integrals in Cylindrical and Spherical Coordinates, Change of Variables in Multiple Integrals.

First Order Differential Equations: Separable Equations, Homogeneous Equations, Exact Equations, First Order Linear Equations, Euler's Method.

Second Order Linear Differential Equations: General Solution of the Homogeneous Second Order Linear Differential Equations with Constants Coefficients, Undetermined Coefficients Method, Variation of Constants Method, Power Series Solution of Differential Equations.

References:

1. **Calculus, Early Transcendental Functions**, R. Smith, R. Minton, McGraw-Hill, 4th ed. 2012.
2. **Advanced Engineering Mathematics,** E. Kreyszig, John Wiley & Sons, INC 10th ed. (2010).
3. **Calculus Early Transcendentals,** Henry Edwards and David E. Penney, C, Prentice Hall, 2008.