

**DEPARTMENT OF MATHEMATICS AND STATISTICS
CLASS SYLLABUS**

CLASS NUMBER – MATH 111 CREDIT HOURS - 03

TITLE OF CLASS – CALCULUS II

CLASS DESCRIPTION – Differentiation and integration of logarithmic, exponential and inverse trigonometric functions. Methods of integration. Indeterminate forms, l'Hospitals rule and improper integrals. First order differential equations: separable equations, linear equations, exact equations, modeling, and applications. Taylor series.

PURPOSE OF CLASS – A continuation of Math 110. This is a required class for students majoring in mathematics, engineering, physics and statistics.

PREREQUISITES – Math 110 or Math 105 with a grade of at least 60%

TEXTBOOK – Calculus, James Stewart, 6th Ed.

CHAPTERS COVERED - 6.2, 6.3, 7.1-7.6, 7.8, 8.1-8.4, 8.8, 9.1-9.3¹, 12.9,12.10², 10.1, 10.3-10.5, 15.3³, Supplementary Material on Exact and Homogeneous Equations.

Notes to the Instructor:

¹Some exercises in Chapter 9 may require numerical methods supported by Computer Algebra systems as in 8.6 and 8.7.

²This is intended to be a quick introduction to Taylor series as an option for treating integrals that are not of closed form. Complete treatment of Power series will be done in Math 217.

³The students will need a short introduction to Partial derivatives before doing Exact differential equations.

DETAILED DESCRIPTION –

Logarithmic and exponential functions (7.1-7.4), inverse trigonometric functions (7.6), indeterminate forms and L'Hospital's rule (7.8).

Methods of integration: Integration by Parts (8.1), Trigonometric integrals and Trigonometric Substitutions (8.2, 8.3), Partial Fractions (8.4), Improper Integrals (8.8), Power (Taylor) Series representations of functions (12.9), Term-by-term differentiation and integration of Taylor series (12.10).

Volumes of Revolutions (6.2, 6.3), Arc Length (9.1,9.2), Applications of integration to Physics and Engineering (9.3).

First order ODEs: Separable Equations(10.3), Linear Equations(10.5), Partial Derivatives and Exact Equations (not covered in Stewart), Homogeneous Equations (not covered in Stewart), Modeling and Applications (including Exponential Growth (7.5 and 10.4), Logistic Growth (10.1 and 10.4), Law of Cooling (10.1), Mixing Problems(10.1)) .

Updated 10/5/06