MATH 1201 (CALCULUS 1) SYLLABUS

Textbook: Single Variable Calculus: Early Transcendentals Eighth edition, Author: James Stewart

1. Functions and Models 1.1-1.5:
    - A brief review of functions, graphs, and operations on functions
2. Limits and Derivatives 2.1-2.3, 2.5-2.8:
    - Tangent and velocity problems
    - The limit of a function
    - Calculating limits using the Limit Laws
    - Intuitive idea of limit, rules of limits
    - Continuity
    - Intermediate Value Theorem
    - Limits at infinity and infinite limits
    - Derivatives and rates of change
    - The derivative of a function
    - Tangent and velocity problems revisited (and rates of change)
    - Concept of the derivative
3. Differentiation Rules 3.1-3.7, 3.9:
    - Derivatives of polynomials and exponential functions
    - Differentiation rules (power, product, and quotient rules)
    - Derivatives of trigonometric functions
    - Chain rule
    - Implicit differentiation
    - Derivatives of inverse trigonometric functions
    - Derivatives of logarithmic functions
    - Rate of change in the natural and social sciences - Physics Related rates
4. Applications of Differentiation 4.1-4.3, 4.7, 4.9:
    - Maximum and minimum values Finding critical points of functions
    - The Closed Interval Method
    - The Mean Value Theorem
    - How derivatives affect the shape of a graph
    - Derivative tests for relative extrema (max and min)
    - Concavity and points of inflection
    - Curve sketching
    - Optimization problems
    - Antiderivatives
5. Integrals 5.1-5.5:
    - Areas and distances
    - Introduction to Riemann sums
    - Definition and properties of the definite integral
    - Area under the curve
    - The Fundamental Theorem of Calculus
    - Indefinite integrals
    - Integration by substitution