About: Math 19 is a 3-unit course in introductory calculus. The class covers limits, derivatives and some applications of differentiation. Topics include a review of elementary functions such as exponential functions and logarithms, limits, rates of change, the derivative, and its applications. Math 19, 20, and 21 cover the same material as Math 41 and 42, but in three quarters rather than two.

Prerequisites: pre-calculus, trigonometry and basic algebra.

Topics:

• Domain and range, graphs, inverse function, odd and even functions, one to one and onto functions
• Exponential function, logarithm, trigonometric functions
• Definition of limit, right and left limits, squeeze theorem
• Continuity, intermediate value theorem
• Limits involving infinity, horizontal and vertical asymptotes.
• Derivative as the slope of the tangent line and instantaneous rate of change.
• Increasing and decreasing functions and the use of derivative to detect them.
• Concavity of functions and the use of second derivative
• Methods of calculating derivative: sum, product and quotient rule
• Chain rule and its applications in implicit differentiation
• Derivative of exponential functions, logarithm, trigonometric functions and their inverse.
• Applications of derivative as a rate of change in other sciences.
• Applications of derivative to detect the local minimum and maximum points of function.
• Applications of derivative in linear approximations and the differential.
• The use of derivative to calculate limits and L'Hospital’s rule.