Course Title	**Mathematics for Engineers I**
Course Code	**MAS025**
Course Type	Compulsory
Level	Undergraduate
Year / Semester	1st year /1st semester
ECTS	5
Course Purpose and Objectives	Introduction to the basic concepts of single variable Calculus
Learning Outcomes	Understand the notions of limits, continuity and differentiability of functions. Be able to calculate derivatives and use them in applications. Be able to calculate definite and indefinite integrals using various techniques as well as use integrals in applications (e.g. volume, arc-length). Study series and power series of functions and be able to recognize geometric, telescopic and harmonic series. Decide their convergence using appropriate tests. Calculate a Taylor series of a function.
Prerequisites	
Course Content	The real number system. Complex numbers (definition, elementary operations). Sequences of real numbers and limits. Real functions of one variable, limits, continuity. Hyperbolic, trigonometric functions. Derivatives of functions of one variable, tangent to a curve. Applications of derivatives. Mean value theorem, monotonicity, extrema, asymptotes. L'Hôpital's rule. Riemannian integral. Fundemental Theorem of Calculus. Indefinite integrals. Integration techniques (substitution, integration by parts, partial fractions, trigonometric substitution, etc). Applications of integrals, calculation of area, volume and length of a curve. Real number series. Convergence criteria. Power series. Series and Taylor's theorem.
Teaching Methodology	
Bibliography	1. J. Stewart, Single variable calculus early transcendentals, 5th edition, 2003. 2. H. Anton, I. Bivens, S. Davis, CALCULUS (7th Edition), John Wiley & Sons, 2003. 3. R. A. Adams, Calculus a complete course, 1991.
Assessment	One midterm (40%) and one final exam (60%)
Language	Greek