Course Code	*Course Num.*	*Course Name*	*Credit Hours*	*Lec.*	*Lab.*	*Tut.*	*Private study*	*Pre-requisites*	*Course Level*
MAT	**1115**	**Calculus (1)**	**5**	**4**	**0**	**2**	**10**	**MAT 1122**	**2**

Topics Outline

1. **Limits and Continuity:** Review of Preliminaries, Concept of Limit, Computation of Limits, Continuity and Its Consequences, The Intermediate Value Theorem, Method of Bisection, Limits Involving Infinity, Asymptotes.

2. **Differentiation:** The Derivative, Tangent Lines and Velocity Computation of Derivatives, The Power Rule Higher Order Derivatives, The Product and Quotient Rules, The Chain Rule, Implicit Differentiation, Derivatives of Inverse Functions, Derivatives of Exponential and Logarithmic Functions, Derivatives of Trigonometric and Inverse Trigonometric Functions, The Mean Value Theorem.

3. **Application of Differentiation:** Indeterminate forms and L'Hopital's rule, First Derivative Test, Maximum and Minimum Values, Increasing and Decreasing Functions, Concavity and The Second Derivative Test, Overview of Curve Sketching, Linear Approximation, Newton's Method, Optimization, Related Rates.

4. **Integration:** Anti-Derivatives, Indefinite Integral, Area, The Definite Integral, The Fundamental Theorem of Calculus, Area Between Curves, Integration by Substitution.

References:

1. **Calculus, Early Transcendental Functions**, Robert Smith, Roland Minton, McGraw-Hill Science Engineering, 2007.
2. **Essential Calculus with Application**; Richard A. Silverman, Dover Publications, 1989.
3. **Calculus**, O. Swokowski, et al, PWS Pub. Co.; 6th edition (1994).
4. **Calculus Early Transcendentals**, C. Henry Edwards, David E. Penney, Prentice Hall, 2008.