Course Code	Course Num.	Course Name	Credit Hours	Lec.	Lab.	Tut.	Private study	Pre-requisites	Course Level
MAT	1116	Calculus (2)	5	4	0	2	10	MAT 1115	3

Topics Outline

1. **Integration Techniques:** Review of Integration by Substitution, Integration by Parts, Integration of Rational Functions Using Partial Fractions, Trigonometric Techniques of Integration, Integrals Involving Powers of Trigonometric Functions. Integrals Involving Logarithmic, Exponential, and Hyperbolic Functions, Improper Integrals, Numerical Integration.

2. **Applications of Definite Integrals:** Area between curves, Volumes by slicing, Volumes using Cylindrical Shells, Disks and Washers, Arc Length and Surface Area, Work, Moments and Center of mass.

3. **Infinite Series:** Sequences of Real Numbers, Infinite Series, Remarkable Infinite Series (Geometric Series, P-Series, Alternating Series, Telescoping Series), Convergence Tests (Ratio Test, Root Test, Comparison and Limit Comparison Test, Integral Test), Power Series, Taylor Series, Representation of Functions as Infinite Series, Differentiation and Integration of Power Series, and Taylor and Maclaurin Series

4. **Parametric Equations and Polar Coordinates:** Plane Curves and Parametric Equations, Calculus and Parametric Equations, Arc Length and Surface in Parametric Equations, Polar Coordinates, Calculus and Polar Coordinates, Conic Sections, Study of Conic Sections in Polar Coordinates.

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.