OBJECTIVES:

1. Learn to find and use limits of functions.
2. Learn to find the derivatives of elementary algebraic functions and trigonometric functions.
3. Learn to use derivatives for graphing algebraic and trigonometric functions and to solve optimization problems.
4. Learn to sketch graphs for different functions.

BSM 101 Calculus and Analytical Geometry - I										
Teaching Scheme					Examination Scheme					
L	T	P	C	Hrs./Week	Theory			Practical		Total Marks
					MS	ES	IA	LW	LE/Viva	
3	1	---	4	4	25	50	25	---	---	100

UNIT I   **10**

Continuity, rate of change of a function, Derivatives of the various trigonometric functions, inverse function, ,inverse trigonometric functions, exponential function, Logarithmic functions, Hyperbolic functions, Inverse hyperbolic functions, higher order derivatives, Lebinitz's rule

UNIT II   **10**

Taylor's series and Maclaurin's series Maxima-minima of functions (Definitions and examples, a necessary condition for the existence of extreme points), Mean value theorems (Rolle's theorem, Lagrange's mean value theorem, Cauchy Mean value Theorem), Sufficient conditions for the existence of extreme points (First derivative test, Second derivative test), Concavity/convexity, Points of inflection.

UNIT III   **10**

Sequence and its convergence, Series, limit of series, convergence and divergence of series, integral test , root test, ratio test, lebnitz's test, logarithmic test

UNIT IV   **09**

Tangent, Normal, curvature, asymptotes(parallel and oblique), curve tracing (Cartesian, polar and parametric)

APPROXIMATE TOTAL   **39 Hours**

Texts and References
1. Thomas' Calculus, eleventh edition, Pearson.
2. Calculus (5th Edition), James Stewart, Thomson (2003).

OUTCOMES:

1. Student will analyze and evaluate limits (including infinite limits) graphically, numerically, and analytically.
2. Student will memorize and apply basic differentiation rules.
3. Student will apply differentiation techniques to find tangent lines, normal lines, and rates of change.
4. Student will evaluate derivatives by implicit differentiation
5. Student will apply differentiation techniques to evaluate higher order derivatives.
6. Student will apply differentiation techniques to identify (relative and absolute) extrema.
7. Student will apply Rolle's Theorem and Mean Value Theorem
8. Student will identify relative extrema by using the first and second derivative tests.
9. Student will apply differentiation techniques to find intervals of in/decreasing and concavity.
10. Student will demonstrate knowledge of curve sketching.