Course – 5 Title: Mathematics-I
Course Code: MAT 111 Credit: 3.00 Contact Hour: 3 per week Total marks: 100

11.1 **Rationale:** To be a computer Engineer one has to have sound knowledge about limit, continuity, differentiability and integration of differential and integral calculus.

11.2 Objectives:

1. To Learn about various limit problems algebraically and graphically
2. To Examine and Apply the continuity and differentiability of various types of function
3. To gain knowledge about Integration and application of Integration.

11.3 Learning Outcomes	**11.4 Course Content**	**11.5 Teaching/Learning Strategy**	**11.6 Assessment Strategy**
1. Define limit and continuity. 2. Justify continuity and differentiability. 3. Explain Differentiability 4. Find the differential coefficient.	**Differential Calculus** Limit, continuity and differentiability, successive differentiation of various types of functions	Lecture Exercise	Assignment Essay Exercise Short answer
1. State and prove the Leibnitz's theorem **2.** Roll's theorem and Mean Value theorem	Leibnitz's rule, Taylor's theorem in finite and infinite forms. Maclaurin's theorem in finite and infinite forms. Roll's theorem, Mean Value theorem	Lecture Exercise	Assignment Essay Exercise Short answer
1. Define Partial Derivative 2. Derive Euler's theorem.	Partial differentiation, Euler's theorem.	Lecture Exercise	Assignment Essay Exercise Short answer
1. Determine the Equations of Tangent and normal.	Equations of Tangent and normal.	Lecture Exercise	Assignment Essay Exercise Short answer
1. Determine the maximum and minimum. 2. Discuss the maximum and minimum. 3. Evaluate maximum and minimum of function	Determination of maximum and minimum values of functions and points of inflexion	Lecture Exercise	Assignment Essay Exercise Short answer
1. Explain Curvature, radius of curvature and center of curvature	Curvature, radius of curvature and center of curvature.	Lecture Exercise	Assignment Essay Exercise Short answer
1. Compute Integral of functions	**Integral Calculus** Integration by various methods	Lecture Exercise	Assignment Essay Exercise

			Short answer
1. List the properties of Definite Integrals 2. Define Gamma and Beta Function. 3. Find the relation between Gamma and Beta Function	Definite Integrals, Gamma Beta Function,	Lecture Exercise	Assignment Essay Exercise Short answer
1. State and prove Walli's formula 2. Deduce Reduction Formula 3. Explain improper integral 4. Derive area of various curves.	Walli's formula, Reduction Formula, Improper integral, Determination of Area	Lecture Exercise	Assignment Essay Exercise Short answer

RECOMMENDED BOOKS AND PERIODICALS

Book References:

1. S.P. Gordon : Calculus and the Computer.
2. L.I. Holder : Calculus and Analytic Geometry.
3. J.F. Hurley : Calculus
4. Willard, Stephen : Calculus and its Application
5. J. Stewart : Calculus.