

## MS – 173      CALCULUS

### **Vectors**

Review of vectors, Vector derivatives. Line and surface Integrals. Gradient of a Scalar.

### **Complex Number**

Argand diagram, De Moivre formula, roots of polynomial equations, curve and regions in the complex plane, standard functions and their inverses (exponential, circular and hyperbolic functions).

### **Limits and Continuity**

Bounds and bounded sets, Limit point of sets, Sequence, Convergence of sequences monotonic sequences, Function and their graph, limit of function and continuous functions.

### **Differential Calculus**

Differentiation and Successive differentiation and its application; Leibnitz theorem, Taylor and Maclaurin theorems with remainders in Cauchy and Lagrange form, Taylor and Maclaurin series, L'Hopitals Rule, extreme values of a function of one variable using first and second derivative test, asymptotes of a function, curvature and radius of curvature of a curve, partial differentiation, exact differential and its application in computing errors, Multivariate functions, Maxima and Minima for multivariate functions, Maxima Minima under certain conditions (Language Multiplier).

### **Integral Calculus**

Indefinite integrals and their computational techniques, reduction formulae definite integrals and their convergence, Beta and Gamma functions and their identities, double and triple integration with applications. (Area, Volume, centroid, inertia, arc length).

### **Vector Algebra**

Scalar and Vector quantities, physical and geometrical meanings. Algebraic of vectors. Scalar and Vector triple products.

### **Recommended Books:**

1. "Engineering Mathematics", Anthony Croft, Robert Davison and Martin Hargeaves, Pearson Education Limited, 3<sup>rd</sup> Edition, 2001.
2. "Calculus", Thomas & Finney, 3<sup>rd</sup> Edition, Addison Wesley Longman, 2006.
3. "Engineering Mathematics", K.A.Stroud and Dexter J. Booth, 6<sup>th</sup> Edition, Industrial Press, 2007.
4. "Calculus and Analytical Geometry", Howard Anton, John Wiley & Sons Inc, 5<sup>th</sup> Edition, 1998.
5. "Complex Analysis for Mathematics and Engineering", John H. Mathews, Jones and Bartlett Publishers Inc. 5<sup>th</sup> Edition, 2006.