

**0944 -DIPLOMA IN INFORMATION TECHNOLOGY &
ENGINEERING
SEMESTER -I
094422 APPLIED MATHEMATICS – II**

RATIONALE

Applied Mathematics forms the backbone of engineering discipline. Basic elements of differential calculus, integral calculus, differential equations and coordinate geometry have been included in the curriculum as foundation course and to provide base for continuing education to the students

DETAILED CONTENTS

1. Co-ordinate Geometry

1.1 Area of a triangle, centroid and incentre of a triangle (given the vertices of a triangle), Simple problems on locus

1.2 Equation of straight line in various standard forms (without proof) with their transformation from one form to another, Angle between two lines and perpendicular distance formula (without proof)

1.3 Circle: General equation and its characteristics given:

- The center and radius
- Three points on it
- The co-ordinates of the end's of the diameter

1.4 Conics (parabola, ellipse and hyperbola), standard equation of conics (without proof), given the equation of conic to calculate foci, directrix, eccentricity, latus rectum, vertices and axis related to different conics Differential Calculus

2. Differential Calculus

2.1 Concept of function, four standard limits

Lt $(x_n - a_n) / (x - a)$, Lt Sin x/x , Lt $(ax-1)/x$ Lt $(1+x)^{1/x}$

$x \rightarrow a$ $x \rightarrow \infty$ $x \rightarrow 0$ $x \rightarrow 0$

2.2 Concepts of differentiation and its physical interpretation

- Differentiation by first principle of x^n , $(ax + b)^n$, Sin x , cos x , tan x , sec x , cosec x and cot x , e^x , a^x , log x . Differentiation of a function of a function and explicit and implicit functions
- Differentiation of sum, product and quotient of different functions
- Logarithmic differentiation. Successive differentiation excluding n^{th} order

2.3 Application of derivatives for (a) rate measure (b) errors (c) real root by Newton's method (d) equation of tangent and normal (c) finding the maxima and minima of a function (simple engineering problems)

3. Integral Calculus

- 3.1 Integration as inverse operation of differentiation
- 3.2 Simple integration by substitution, by parts and by partial fractions
- 3.3 Evaluation of definite integrals (simple problems) by explaining the general properties of definite integrals
- 3.4 Applications of integration for
 - Simple problem on evaluation of area under a curve where limits are prescribed
 - Calculation of volume of a solid formed by revolution of an area about axis (simple problems) where limits are prescribed
 - To calculate average and root mean square value of a function
 - Area by Trapezoidal Rule and Simpson's Rule

4. Differential Equations

Solution of first order and first degree differential equation by

- Variable separation
- Homogeneous differential equation and reducible homogeneous differential equations
- Linear differential equations and reducible linear differential equations

RECOMMENDED BOOKS

1. Higher Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
3. Engineering Mathematics vol. II by S Kohli and Others, IPH, Jalandhar
4. Engineering Mathematics by Ishan Publication
5. Applied Mathematics Vol. II by SS Sabharwal and Others; Eagle Parkashan, Jalandhar
6. Engineering Mathematics by IB Prasad
7. Applied Mathematics Vol. II by Dr RD Sharma
8. Advanced Engineering Mathematics by AB Mathur and VP Jagi; Khanna Publishers, Delhi
11. Engineering Mathematics by C Dass Chawla; Asian Publishers, New Delhi