

Applied Mathematics

Code: ZBSC-101

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3 0 0

Theory : 100

Practical : 00

Total : 100

Objectives:

1. Acquire knowledge in matrix theory, a part of linear algebra, which has wider application in engineering problems.
2. To make the student knowledgeable in the area of Permutation and combination, trigonometric functions and to solve engineering problems based on the above concepts.
3. To make the student knowledgeable with basic and applied mathematics for further application.

Learning Outcome:

1. The graduates will become familiar with fundamentals of various Mathematical concepts.
2. Students will be able to set up and solve linear systems/linear inequalities graphically/geometrically and algebraically
3. Students will be able to formulate problems in the language of sets and perform set operations, and will be able apply the Fundamental Principle of Counting, Multiplication Principle.
4. Solve equations and inequalities, both algebraically and graphically, and Solving and model applied problems.

Skill Set

1. Acquire more knowledge in basic concepts of engineering mathematics.
2. To improve problem evaluation technique.
3. Choose an appropriate method to solve a practical problem.

Content

1. Algebra:

- 1.1. Set theory
- 1.2. Permutation and Combination
- 1.3. Binomial theorem (expansion without proof)
- 1.4. Types of functions – linear, quadratic, polynomial, exponential and logarithmic

2. Trigonometric functions:

- 2.1. Review of ratio of some standard angles (0, 30, 45, 60, 90 degrees)

- 2.2. Addition, subtraction and product formulae
- 2.3. Multiple and submultiples angles ($2A$, $3A$, $A/2$)
- 2.4. Height and distance

3. Determinants and matrix:

- 3.1. Introduction to Determinant and matrices
- 3.2. Algebra of matrices (up to third order)
- 3.3. Inverse of matrix by Adjoint method (up to second order)
- 3.4. Solution of system of linear equations by Cramer's rule

4. Differential calculus:

- 4.1. Rules of differentiation – simple standard forms (involving one variable)
- 4.2. Derivatives of algebraic and trigonometric functions
- 4.3. Differentiation of function of a function
- 4.4. Chain rule

5. Integral calculus:

- 5.1. Integral of standard forms
- 5.2. Simple integration by substitution
- 5.3. Integration by parts and by fractions (for linear factor only)
- 5.4. Evaluation of definite integrals

Suggested Readings:

1. NCERT- 11th and 12th Mathematics.
2. Advanced Engineering Mathematics, E. Kresyzig, John Wiley and Sons. (latest edition).
3. Higher Engineering Mathematics, B.S. Grewal, Khanna Publications
4. Advanced Engineering Mathematics, R.A Jain and S.R.K Iyengar. Narosa Publications.
5. Engineering Mathematics, N.P Bali, Laxmi Publications.