15

# **22MT101 ELEMENTARY MATHEMATICS**

Hours Per Week :

L	Т	Ρ	С	
3	2	0	4	

**PREREQUISITE KNOWLEDGE:** Basics of Geometry and Algebra.

### COURSE DESCRIPTION AND OBJECTIVES:

The objective of the course is to make student acquainted with preliminary concepts of mathematics that are useful for their engineering study. Students will learn concepts of progression, partial fractions, straight line, trigonometry, calculus which will help them to apply in various aspects of engineering fields.

## **MODULE-1**

12L+8T+0P=20 Hours

## MATHEMATICAL PRELIMINARIES

Partial fractions, Arithmetic progressions, Geometric progressions.

### UNIT-2

UNIT-1

### STRAIGHT LINES AND TRIGONOMETRIC RATIOS

**Straight lines:** Point in coordinate plane, distance formula, straight line, slope, equation of straight in different forms.

**Trigonometric ratios:** Trigonometric ratios, values in different quadrants, compound angels, multiple angles.

### PRACTICES

- Splitting a given improper fraction
- Finding the general term and sum of infinite terms of a progression.
- Finding equation of a straight line in various form
- Find the tangent and normal.
- Evaluation of trigonometric function.

### MODULE-2

### UNIT-1

## CALCULUS

Differential Calculus: Introduction to differentiation, Derivatives of simple functions, Product rule, Quotient rule and Chain rule of differentiation.

Integral calculus: Integration as anti-derivative process, Standard forms, Methods of integration: by substitution, by parts, and by partial fractions.

Definite integration.

## 12L+8T+0P=20 Hours

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ELECTED TOPICS & PROBLEM SOU

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## 12L+8T+0P=20 Hours

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#### SKILLS:

- ✓ Focusing on Trigonometric Ideas.
- ✓ Know the various trigonometric functions.
- ✓ Understanding the Applications of Trigonometry and straight lines.
- ✓ Understand basic applications of calculus.

### UNIT-2

### **APPLICATIONS OF CALCULUS**

Tangent, normal, velocity and acceleration. Evaluation of length and area by integration

### **PRACTICES:**

- To calculate the profit and loss in business using graphs.
- To check the temperature variation.
- To determine the speed or distance covered.
- Derivatives and integration are used to derive many equations in Physics.
- In the study of Seismology like to find the range of magnitudes of the earthquake.

### COURSE OUTCOMES:

Upon successful completion of this course, students will have the ability to:

CO No.	Course Outcomes	Blooms Level	Mod- ule No.	Mapping with POs
1	Apply the concepts of straight line in real life problems.	Apply	1	1, 2, 9, 10, 12
2	Apply the concepts of calculus in real life problem.	Apply	2	1, 2, 9, 10, 12
3	Distinguish between finite and infinite AP and determine the general term.	Analyse	1	1, 2, 9, 10, 12
4	Categorize right angle triangles to evaluate the trigonometric ratios.	Analyse	2	1, 2, 9, 10, 12

### **TEXT BOOKS:**

- 1. John Bird, "Higher Engineering Mathematics", 5th edition, Routledge (Taylor & Francis Group), London, New York, 2018.
- 2. Veerarajan, T., "Engineering Mathematics", 1st edition, Tata McGraw Hill Publishing Co., New Delhi, 2019.

### **REFERENCE BOOKS:**

- 1. P. Kandasamy, K. Thilagavathy, K.Gunavathy, "Engineering Mathematics", 3rd edition, S.Chand& Co., New Delhi, 2017.
- P. Seshagiri Rao, "A Text Book of Remedial Mathematics", 3rd edition, PharmaMed Press / BSP Books, 2018.
- 3. Nabjyoti Dutta, Bulendra Limboo, Bismeeta Buragohain, Pranjal Talukdar, "A Basic Course in Mathematics for Polytechnic Vol.1, Vol.2", Second Edition, Mahaveer Publications, 2017.