INSTITUTE	**DIPLOMA STUDIES**
PROGRAM	**DIPLOMA ENGINEERING (MECHANICAL ENGINEERING)**
SEMESTER	**1**
COURSE TITLE	**MATHEMATICS-I**
COURSE CODE	**09MA2101**
COURSE CREDITS	**4**

Objective:

1 Students are intended to understand the basic concepts and principles of Mathematics such as basic mathematics, HCF and LCM, polynomials, mensuration and trigonometry. This knowledge is required to understand and solve Engineering problems. The course will empower students to use proper Mathematical tool to understand Engineering principles and concepts. Main objective of the course is to apply concepts of basic mathematics, HCF and LCM, polynomials, mensuration and trigonometry or suitable Mathematical tool to solve given engineering problems.

Course Outcomes: After completion of this course, student will be able to:

1 Classify the different types of sets of numbers.
2 Understand the laws of power of numbers.
3 Find LCM and HCF of numbers.
4 Solve simple problems on algebraic expressions.
5 Compute the area and perimeter of 2D-shapes and volume and surface area of 3D-shapes.
6 Solve the applied problems using right triangle trigonometry.

Pre-requisite of course: Basic Mathematics

Teaching and Examination Scheme

Theory Hours	Tutorial Hours	Practical Hours	ESE	IA	CSE	Viva	Term Work
2	2	0	50	30	20	25	25

Contents : Unit	Topics	Contact Hours
1	**Basic calculation** Set of Numbers, Indices	2
2	**HCF and LCM of numbers** HCF of integer, LCM of integer, HCF and LCM of fractions, HCF and LCM of decimals	4
3	**Polynomials** Definition, Arithmetic properties of polynomials, Algebraic identities	4

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Contents : Unit	Topics	Contact Hours
4	**Mensuration** Area and perimeter of square, rectangle, triangle, trapezium, parallelogram, rhombus, circle, Surface area and volume of cube, cuboid, cone, cylinder, sphere	8
5	**Trigonometry** Introduction to Trigonometry ratios, Concept of angles, Unit circle, T- Ratios of multiple angles, sub-multiple angles	10
Total Hours		**28**

Suggested List of Experiments:

Contents : Unit	Topics	Contact Hours
1	**Basic calculation** Set of numbers and indices	2
2	**HCF and LCM of numbers** HCF and LCM of numbers, HCF and LCM of fractions and decimals	4
3	**Polynomials** Arithmetic properties of polynomials, Algebraic identities	4
4	**Mensuration** Area and perimeter of square, rectangle, triangle, Area and perimeter of trapezium, parallelogram, rhombus, circle, Surface area and volume of cube, cuboid, cone, Surface area and volume of cylinder, sphere	8
5	**Trigonometry** Trigonometric Ratios, Concept of angles, Unit circle, T- Ratios of multiple angles, sub-multiple angles	10
Total Hours		**28**

Textbook :

1 NCERT Class-XI science Mathematics , NCERT, NCERT, 2022
2 NCERT MATHEMATICS for class-VI, NCERT, NCERT, 2022
3 NCERT Class-X Mathematics, NCERT, NCERT, 2022

References:

1 NCERT Class-XI science Mathematics, NCERT Class-XI science Mathematics, NCERT, NCERT, 2022
2 NCERT MATHEMATICS for class-VI, NCERT MATHEMATICS for class-VI, NCERT, NCERT, 2022
3 NCERT Class-X Mathematics, NCERT Class-X Mathematics, NCERT, NCERT, 2022

Suggested Theory Distribution:

The suggested theory distribution as per Bloom's taxonomy is as follows. This distribution serves as guidelines for teachers and students to achieve effective teaching-learning process

Distribution of Theory for course delivery and evaluation					
Remember / Knowledge	**Understand**	**Apply**	**Analyze**	**Evaluate**	**Higher order Thinking**
30.00	30.00	30.00	10.00	0.00	0.00

Instructional Method:

1. The course delivery method will depend upon the requirement of content and need of students. The teacher in addition to conventional teaching method by black board, may also use any of tools such as demonstration, Quiz, brainstorming
2. The internal evaluation will be done on the basis of continuous evaluation of students in the class-rooms

Supplementary Resources:

1. https://en.wikipedia.org/wiki/Set_(mathematics)
2. https://en.wikipedia.org/wiki/Least_common_multiple
3. https://en.wikipedia.org/wiki/Polynomial
4. https://en.wikipedia.org/wiki/Mensuration
5. https://en.wikipedia.org/wiki/Trigonometry

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