

Course Name: All Branches of Diploma in Engineering and Technology.

Course code : EJ/EN/ET/EX/EV/IC/IE/IS/MU/DE/ ME/PG/PT/AE/ CE/CS/CR/
CO/CM/IF/ EE/EP/CH/CT/PS/CD/ED/EI/CV/MH/FE/IU

Semester: First

Subject Title: Basic Mathematics

Subject Code: 9003

Teaching and examination scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	Paper Hrs	TH	TEST	PR	OR	TW	TOTAL
04	01	--	03	80	20	--	--	--	100

RATIONALE:

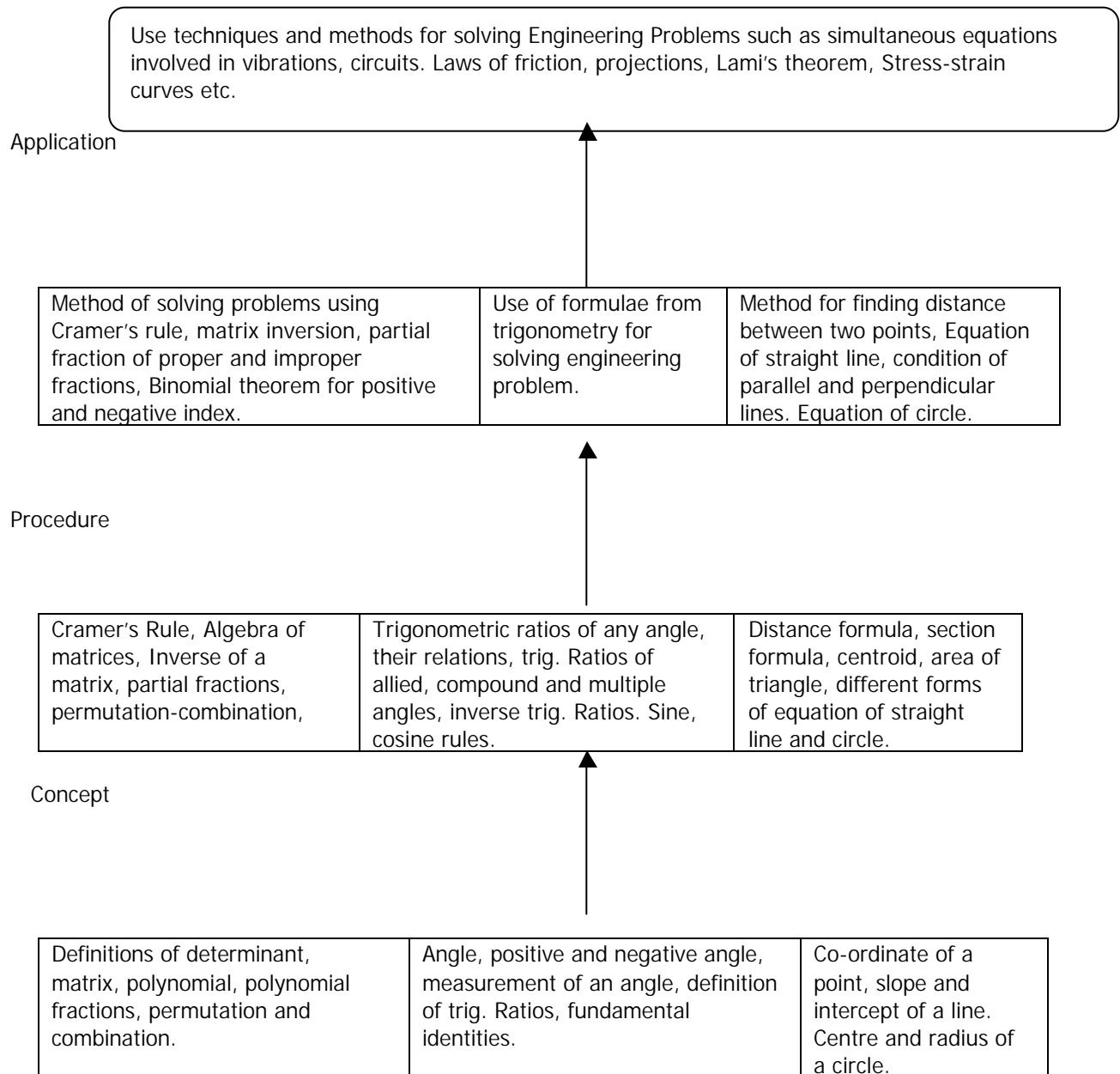
The subject is classified under basic sciences and intends to teach students Basic facts, concepts and principles of mathematics, as a tool to analyze Engineering problems. Mathematics lays down the foundation to understand Core technology subjects.

OBJECTIVE:

The student will be able to:

1. Develop process of logical thinking
2. Comprehend the principles of other subjects.
3. Solve problems by using Analytical and systematic approach

LEARNING STRUCTURE:



Facts

CONTENTS: Theory

Chapter	NAME OF TOPIC	Hrs	Marks
1.	ALGEBRA		
	1.1 REVISION 1.1.1 Laws of Indices 1.1.2 Formula of factorization and expansion (a^2-b^2), $(a+b)^2$ etc.) 1.1.3 Laws of logarithm with definition of Natural and Common logarithm	01	
	1.2 PARTIAL FRACTION 1.2.1 Definition of polynomial fraction proper & improper fractions and definition of partial fractions. 1.2.2 To Resolve proper fraction into partial fraction with denominator containing non repeated linear factors, repeated linear factors and irreducible non repeated quadratic factors. 1.2.3 To resolve improper fraction into partial fraction.	04	08
	1.3 DETERMINANT AND MATRICES 1.3.1 Determinant Mks: 04 1.3.1.1 Definition and expansion of determinants of order 2 and 3. 1.3.1.2 Cramer's rule to solve simultaneous equations in 2 and 3 unknowns. 1.3.2 Matrices Mks: 16 1.3.2.1 Definition of a matrix of order $m \times n$ and types of matrices. 1.3.2.2 Algebra of matrices such as equality, addition, Subtraction, scalar multiplication and multiplication. 1.3.2.3 Transpose of a matrix. 1.3.2.4 Minor, cofactor of an element of a matrix, adjoint of matrix and inverse of matrix by adjoint method. 1.3.2.5 Solution of simultaneous equations containing 2 and 3 unknowns by matrix inversion method.	10	20
	1.4 BINOMIAL THEOREM 1.4.1 Definition of factorial notation, definition of permutation and combinations with formula. 1.4.2 Binomial theorem for positive index. 1.4.3 General term. 1.4.4 Binomial theorem for negative index. 1.4.5 Approximate value (only formula)	04	04
02	TRIGONOMETRY		

	2.1 REVISION 2.1.1 Measurement of an angle (degree and radian). Relation between degree and radian. 2.1.2 Trig ratios of 0° , 30° , 45° etc. 2.1.3 Fundamental identities.	01	04
	2.2 TRIGONOMETRIC RATIOS OF ALLIED, COMPOUND, MULTIPLE & SUBMULTIPLE ANGLES (Questions based on numerical computations, which can also be done by calculators, need not be asked particularly for allied angles).	06	08
	FACTORIZATION AND DEFACTORIZATION FORMULAE	02	04
	2.2 INVERSE TRIGONOMETRIC RATIOS 2.4.1 Definition of inverse trig, ratios, Principal values of inverse trigonometric ratios. 2.4.2 Relation between inverse trigonometric ratios.	02	04
	2.3 PROPERTISE OF TRIANGLE 2.5.1 Sine, Cosine, Projection and tangent rules (without proof) 2.5.2 Simple problems.	02	04

03	COORDINATE GEOMETRY		
	3.1 POINT AND DISTANCES 3.1.1 Distance formula, Section formula, midpoint, centroid of triangle. 3.1.2 Area of triangle and condition of collinearity.	04	04
	3.2 STRAIGHT LINE 3.2.1 Slope and intercept of straight line. 3.2.2 Equation of straight line in slope point form, slope-intercept form, two-point form, two-intercept form, normal form. General equation of line. 3.2.3 Angle between two straight lines condition of parallel and perpendicular lines. 3.2.4 Intersection of two lines. 3.2.5 Length of perpendicular from a point on the line and perpendicular distance between parallel lines.	06	12
	3.3 CIRCLE 3.3.1 Equation of circle in standard form, centre – radius form, diameter form, two – intercept form. 3.3.2 General equation of circle, its centre and radius.	06	08
	Total	48	80

Tutorial:

Tutorial No.	Topic on which tutorial is to be conducted
1	Partial fractions
2	Determinants
3	Matrices
4	Solution of simultaneous equation by Matrix inversion method.
5	Binomial theorem
6	Trigonometry- fundamental identities-revision only
7	Trigonometry-allied, compound and multiple angles
8	Trigonometry-factorization and defactorization formulae.
9	Trigonometry-inverse trigonometric ratios.
10	Point and distances
11	Straight line
12	Circle.

Note:

Tutorials are to be used to get enough practice for solving problems. It is suggested that in each tutorial at least five problems be solved

LEARNING RESOURCES:**1. Books:**

Sr. No.	Authors	Title	Publisher
1	S. P. Deshpande	Mathematics for polytechnic	Pune Vidyarthi Griha
2	S. L. Loney	Trigonometry	S. Chand Publication
3	Frc.G. Valles	College Algebra	Charotar Publication
4	Ayres	Matrices	Schuam series, McGraw hill
5	B. S. Grewal	Higher Engineering Mathematics	Khanna publications New Dehli
6	S. S. Sastry	Engineering Mathematics	Prentice Hall of India