

Course Name : Diploma in Computer Science and Engineering

Course Code : CW

Semester : First

Subject Title : Basic Mathematics

Subject Code : 12003

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme					
TH	TU	PR	PAPER HRS	TH	PR	OR	TW	TOTAL
04	01	--	03	100	--	--	--	100

Notes:

- **This subject is common for all courses.**
- **For smooth implementation and uniformity, the schedule for tutorial is given separately.**
- **Two tests each of 25 marks to be conducted as per the schedule given by MSBTE.**
- **Total of tests marks for all theory subjects are to be converted out of 50 and to be entered in mark sheet under the head Sessional Work. (SW)**

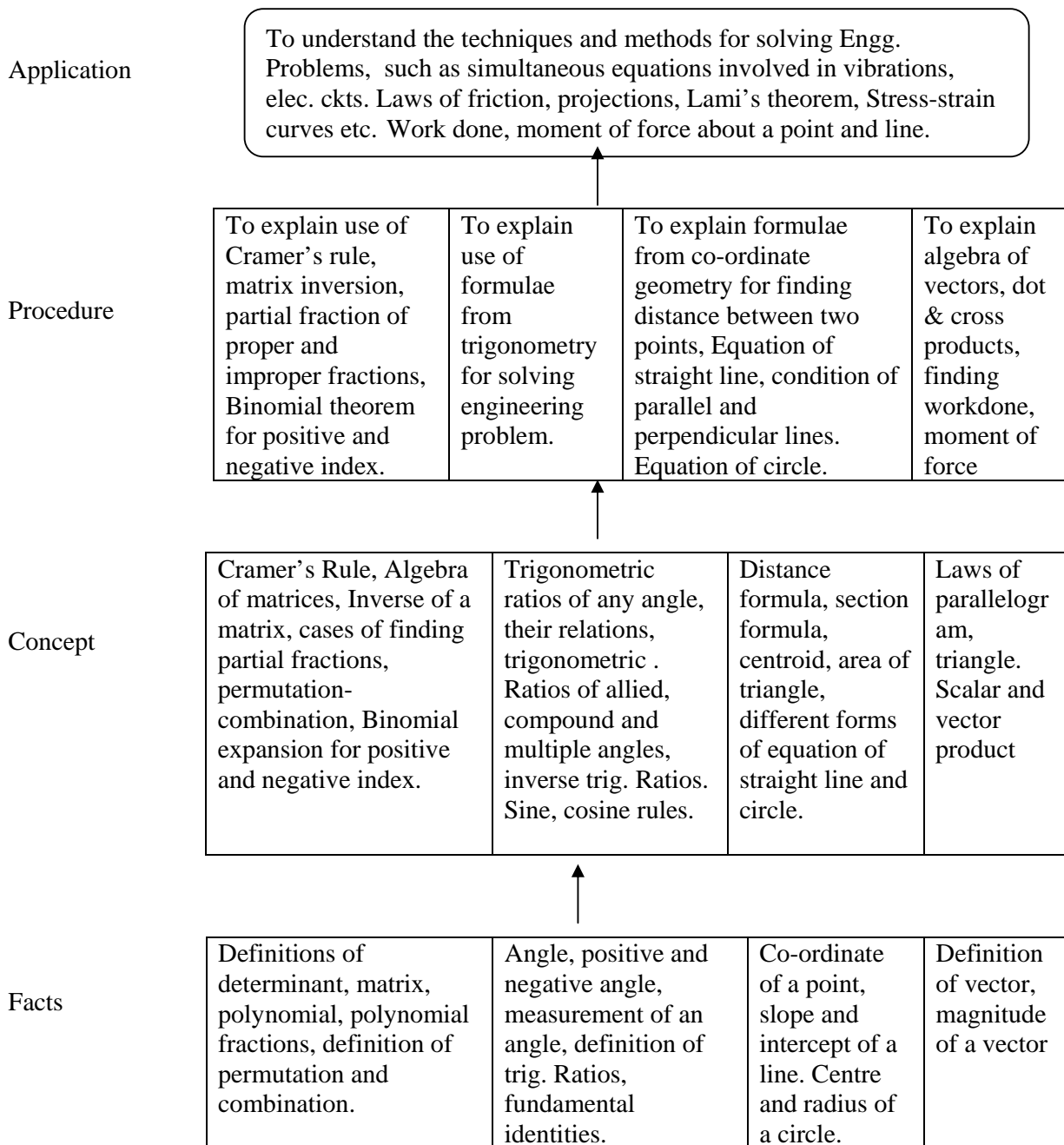
RATIONALE:

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 lay down the foundation for understanding core technology subjects.

OBJECTIVE:

This subject helps the students to develop logical thinking, which is useful in comprehending the principles of all other subjects. Analytical and systematic approach towards any problem is developed through learning of this subject. Mathematics being a versatile subject can be used at every stage of human life.

Learning Structure:



Contents: Theory

Chapter		Hours	Marks
1.	ALGEBRA		
	1.1 Logarithms: 1.1.1 Definition of logarithm (Natural and Common logarithm.) 1.1.2 Laws of logarithm 1.1.3 Examples based on 1.1.1 to 1.1.2	03	06
	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 Determinant ----- 04 Marks 1.3.1 Definition and expansion of determinants of order 2 and 3. 1.3.2 Cramer's rule to solve simultaneous equations in 2 and 3 unknowns. Matrices----- 16 Marks 1.3.3 Definition of a matrix of order m X n and types of matrices. 1.3.4 Algebra of matrices such as equality, addition, Subtraction, scalar multiplication and multiplication. 1.3.5 Transpose of a matrix. 1.3.6 Minor, cofactor of an element of a matrix, adjoint of matrix and inverse of matrix by adjoint method. 1.3.7 Solution of simultaneous equations containing 2 and 3 unknowns by matrix inversion method.	13	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	06

2	TRIGONOMETRY.		
	2.1 Trigonometric Ratios: 2.1.1 Trigonometric ratios of any angle 2.1.2 Relation between degree and radian. 2.1.3 Fundamental identities. 2.1.4 Examples based on Fundamental Identities	03	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).	08	12
	2.3 FACTORIZATION AND DEFACTORIZATION FORMULAE	03	04
	2.4 INVERSE TRIGONOMETRIC RATIOS 2.4.1 Definition of inverse trigonometric, ratios, Principal values of inverse trigonometric ratios. 2.4.2 Relation between inverse trigonometric ratios.	03	04
3	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	08
	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.	08	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.	04	08
4	VECTORS		
	4.1 Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication)	04	04
	4.2 Dot (Scalar) product with properties. 4.3 Vector (Cross) product with properties.		
	4.4 Applications of Vectors 4.4.1 Work done and moment of force about a point & line	03	04
TOTAL		64	100

LEARNING RESOURCES:

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

Tutorial:

Tutorial	Topic on which tutorial is to be conducted
1	Logarithm
2	Partial fractions
3	Determinants
4	Matrices
5	Solution of simultaneous equation by Matrix inversion method.
6	Binomial theorem
7	Trigonometry- fundamental identities-revision only
8	Trigonometry-allied, compound and multiple angles
9	Trigonometry-factorization and defactorization formulae.
10	Trigonometry-inverse trigonometric ratios.
11	Point and distances
12	Straight line
13	Circle.
14.	Vectors
15.	Vectors' applications

Note:

Maximum 5 questions are to be given in each tutorial, in which two 2 marks questions (based on basic concept and formulae with one/two step calculations) and three 4 marks questions are expected.