



GUJARAT TECHNOLOGICAL UNIVERSITY

Program Name: Engineering

Level: Diploma

Branch: All

Course / Subject Code : **DI01000021**

Course / Subject Name : Mathematics-I

w. e. f. Academic Year:	2024
Semester:	1 st Semester
Category of the Course:	BSC

Prerequisite:	Linear equation in two variables, Factorization, Polynomial, Quadratic Equation, Coordinate Geometry, LCM, GCD, Concept of Set.
Rationale:	This course of Mathematics is being introduced for providing a solid foundation in basic mathematics concepts and operations that are crucial for further education and everyday problem-solving. This course is an attempt to include topics which are directly applicable to various fields of engineering, technology, business and sciences and develop logical reasoning and critical thinking abilities. The course is designed focusing on multidisciplinary and competency development to ensure students can effectively use mathematical methods and principles in their vocational and technical fields. The components of course ensure that it is comprehensive, practical and aligned with both academic and professional requirements.

Course Outcome:

After Completion of the Course, Student will able to:

No	Course Outcomes	RBT Level
01	Interpret the function graphically, numerically and analytically.	A(Application)
02	Demonstrate the ability to algebraically analyse basic functions used in Trigonometry.	A(Application)
03	Demonstrate the ability to Crack engineering related problems based on concepts of Vectors.	A(Application)
04	Solve basic engineering problems under given conditions of straight lines and circle.	A(Application)
05	Demonstrate the ability to analyse and illustrate the Functions using the concept of Limit.	A(Application)

**Revised Bloom's Taxonomy (RBT)*



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Teaching and Examination Scheme:

Teaching Scheme (in Hours)			Total Credits L+T+ (PR/2)	Assessment Pattern and Marks				Total Marks
L	T	PR	C	Theory		Tutorial / Practical		
				ESE (E)	PA / CA (M)	PA/CA (I)	ESE (V)	
3	1	0	4	70	30	-	-	100

Course Content:

Unit No.	Content	No. of Hours	% of Weightage
1. Determinant and Function	1.1 Determinant and its value up to 3rd order (Without properties) 1.2 Function and simple examples. 1.3 Logarithm as a function 1.4 Laws of Logarithm and related Simple examples	9	23
2. Trigonometry	2.1 Units of Angles (degree and radian) 2.2 Trigonometric Functions 2.3 Allied & Compound Angles, Multiple –Submultiples angles 2.4 Graph of Sine and Cosine, 2.5 Periodic Trigonometric function 2.6 Sum and factor formulae 2.7 Inverse Trigonometric function	12	20
3. Vectors	3.1 Vector, Addition, Subtraction, Magnitude and direction. 3.2 Scalar and Vector Product and it's properties 3.3 Angle between two Vectors 3.4 Applications of Scalar and Vector Product (Work Done and Moment of Force)	9	20



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4. Coordinate Geometry	4.1 Straight line (Two-point form) and slope of straight line 4.2 Slope point form, Intercept form, General form of line 4.3 Condition of parallel and perpendicular lines 4.4 Equations of Parallel lines and Perpendicular lines to the given lines 4.5 Angle between two lines. 4.6 Equation of circle with center and Radius. 4.7 General equation of circle. 4.8 Tangent and normal to a circle.	8	20
5. Limit	5.1 Limit of a Function. 5.2 Standard formulae of Limit and related simple examples.	7	17
	Total	45	100

Suggested Specification Table with Marks (Theory):

Unit No.	Unit Title	Distribution of Theory Marks						
		R Level	U Level	A Level	N Level	E Level	C Level	Total
1	Determinant and Function	4	7	5	0	0	0	16
2	Trigonometry	4	5	5	0	0	0	14
3	Vectors	4	6	4	0	0	0	14
4	Coordinate Geometry	4	5	5	0	0	0	14
5	Limit	3	4	5	0	0	0	12
Total		19	27	24	0	0	0	70
%		27	39	34	0	0	0	100

Where R: Remember; U: Understanding; A: Application, N: Analyze and E: Evaluate C: Create (as per Revised Bloom's Taxonomy)

References/Suggested Learning Resources:

(a) Books:

S. No	Title of Book	Author	Publication with place, year and ISBN
1	Engineering Mathematics (Third edition).	Croft, Anthony	Pearson Education, New Delhi, 2014.ISBN 978-81-317-2605-1
2	A Text Book of Vector Analysis	Narayan Shanti and Mittal P.K	S. Chand Publication, ISBN 978-8121922432
3	Calculus and Analytic Geometry	G. B. Thomas, R. L. Finney	Addison Wesley, 9th Edition, 1995.ISBN 978-8174906168
4	Understanding Engineering Mathematics	John Bird	Routledge; 1st edition ISBN 978-0415662840
5	Advanced Engineering	Krezig, Ervin	Wiley Publ., NewDelhi,2014,



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S. No	Title of Book	Author	Publication with place, year and ISBN
	Mathematics		ISBN: 978-0-470-45836-5
6	Mathematics-I	Deepak Singh	Khanna Book Publishing Co ISBN: 978-93-91505-42-4
7	Mathematics-II	Garima Singh	Khanna Book Publishing Co ISBN: 978-93-91505-52-3

(b) Open-source software and website:

	• https://www.youtube.com/channel/UCLJVRQyPYsseCf78QWCDsvA/featured (YouTube Channel of DTEGUJ) • https://www.geogebra.org/?lang=en • https://phet.colorado.edu/ • www.dplot.com/ - DPlot • www.wolfram.com/mathematica/ • https://www.khanacademy.org/ • www.easycalculation.com • www.scilab.org/ - SCI Lab • https://ncert.nic.in/textbook/pdf/lemh102.pdf • https://www.geeksforgeeks.org • https://www.mathsisfun.com/geometry/slope.html • https://www.statisticshowto.com/limit-of-functions/
Apps in Google Play Store	National Digital Library e-Granthalaya NSDC eBook Reader: Kaushal ePustakalaya ePathshala IGNOU e-content

List of Laboratory/Learning Resources Required:

1. Computer System, smart phone & LCD Projector
2. Scientific Calculator (Display type: Natural Display Algebraic input logic: Natural V.P.A.M. Significant function: $10+2$.)

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