

COURSE CODE : DIPLOMA IN TEXTILE MANUFACTURES
COURSE CODE : TM
SEMESTER : SECOND
SUBJECT TITLE : ENGINEERING MATHEMATICS
SUB. CODE : 9006

Teaching and Examination Scheme:

Teaching Scheme			Examination Scheme						
TH	TU	PR	PAPER HRS.	TH	TEST	PR	OR	TW	TOTAL
03	01	--	03	80	20	--	--	--	100

RATIONALE:

In 21st century man has developed new disciplines like information technology, Genetic engineering, Biotechnology etc. on the basis of Mathematics. Thus the study of mathematics is necessary to develop in the student the skills essential for these new disciplines. The subject is extension of basic Mathematics of first Semester and stepping into the prerequisites to learn applied Mathematics. Engineering Mathematics lay down the foundation to understand and express principles and laws involved in other technological subjects.

OBJECTIVE:

The student will be able to:

1. Acquire knowledge of Mathematical term, concept, principals, and different Methods.
2. Develop the ability to apply Mathematical methods to solve technical problems, to execute management, plans with precision.
3. Acquire sufficient Mathematical techniques necessary for daily and practical problems.

LEARNING STRUCTURE:

Relationship between two quantities that vary, continuity of curves.	Use of derivative in applications. Slope of a curve.	Work done moment of force about a point and line	Analysis of experimental data for drawing valid conclusions and decision making process.	To understand various physical quantities. Understanding signal processing, laws of impedance, fluid flow, electricity.
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Application

To explain value of function & types of functions. methods to evaluate limits of different functions.	To explain methods for finding derivative of function. Second order derivative.	To explain algebra of vectors, dot & cross products, finding workdone, moment of force	To explain measures of central tendency and dispersion. addition and multiplication theorem of probability.	Explain geometric meaning of deri., max.& mini., rates, radius of curvature. To explain algebra of complex numbers, Euler's forms, hyperbolic functions.
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Procedure



Dependent and independent variables. Standard formulae for limits. Theorems on limit,	Derivatives of standard functions. Rules of differentiation.	Laws of parallelogram, triangle. Scalar and vector product.	Classification of data, frequency, mean, mode and median. Sample space, event occurrence of event & types	Slope of the curve, increasing decreasing functions. Real and imaginary parts of complex no. Euler's exponential forms.
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Concept



Concept of interval, neighborhood of a point. Definition of function and limit. Meaning of $x \rightarrow a$	Definition of derivative and notation, order of derivative.	Definition of vector, magnitude of a vector	Concept of data, frequency distribution, attribute and variate. Definition of probability, random experiment.	First order and second order derivatives. Number system. Imaginary unit.
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Facts

CONTENTS: Theory

Chapter	Name of the Topic	Hours	Marks
01	Function and Limit 1.1 Function 1.1.1 Definitions of variable, constant, intervals such as open, closed, semi – open etc. 1.1.2 Definition of function, value of a function and types of functions. 1.2 Limit 1.2.1 Definition of neighborhood, concept and definition Limit. 1.2.2 Limits of algebraic, trigonometric, exponential and logarithmic functions with simple examples.	08	16
	Derivatives 2.1 Definition of derivatives, notations. 2.2 Derivatives of standard functions. 2.3 Rules of differentiation. (without proof) Such as Derivatives of sum or difference, scalar multiplication, Product and quotient. 2.4 Derivatives of composite function (chain rule) 2.5 Derivatives of inverse and inverse trigonometric functions, Implicit functions 2.6 Logarithmic differentiation. 2.7 Derivatives of parametric functions. 2.8 Derivative of one function w.r.t. another function. 2.9 Second order differentiation.		
03	Vectors 3.1 Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication) 3.2 Dot (Scalar) and Cross (Vector) product with properties. 3.4 Application Workdone and moment of force about a point & line	04	04
	Workdone and moment of force about a point & line	04	04
04.	Statistic And Probability 4.1 Statistic 4.1.1 Measures of central tendency (mean, medium & mode) for ungrouped and grouped frequency distribution. 4.1.2 Graphical representation (Histogram and Ogive curves) to find mode a medium. 4.1.3 Measures of dispersion such as range, mean deviation, standard deviation, Variance and coefficient of variation. Comparison of two sets of observations.	06	12
	4.2 Probability 4.2.1 Definition of random experiment, sample space, event, occurrence of event and types of events (Impossible, mutually exclusive, exhaustive, equally likely). 4.2.2 Definition of probability, Addition and multiplication theorems of probability	04	08
NOTE: Chapter 5 is for Civil, Electrical, Electronics and Mechanical Groups & Textile Manufacture Group			
05.	5.1 Applications Of Derivative 5.1.1 Geometrical meaning of derivative, tangent and normal. 5.1.2 Rates and motion. 5.1.3 Maxima and minima. 5.1.4 Radius of curvature.	06	08
	5.2 Complex Number 5.2.1 Definition of complex number. Cartesian, polar, Exponential forms of Complex No		

- Note:**
- 1. Chapters 1 to 4 are common for all branches**
 - 2. Chapter 5 – For Civil, Electrical, Mechanical ,Electronics Groups and Textile Manufacture group**
 - 3. Chapter 6 – For Computer Engineering Group**

Tutorial:**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

Tutorial No.	Topic on which tutorial is to be conducted
1	Function
2	Limits
3	Derivative
4	Derivative
5	Derivative
6	Statistics
7	Statistics
8	Probability
9	Probability
10	Application of derivative/ Numerical solution of algebraic equations
11	Application of derivative/ Numerical solution of algebraic equations
12	Complex numbers/ Numerical solution of simultaneous Equations
13	Complex numbers/ Numerical solution of simultaneous Equations

Learning Resources:**Books:**

Sr. No.	Title	Authors	Publications
1	Mathematics for polytechnic	S. P. Deshpande	Pune Vidyarthi Griha Prakashan, Pune
2	Calculus: single variable	Robert T. Smith	Tata McGraw Hill
3	Advanced Engineering Mathematics	Dass H. K.	S. Chand Publication, New Dehli
4	Fundamentals of Mathematical Statistic	S. C. Gupta and Kapoor	S. Chand Publication, New Dehli
6	Higher Engineering Mathematics	B. S. Grewal	Khanna Publication, New Dehli
7	Applied Mathematics	P. N. Wartikar	Pune Vidyarthi Griha Prakashan , Pune