

GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT**Course Curriculum****Course Title: Applied Mathematics - 1
(Code: 3310102)**

Diploma Programme in which this course is offered	Semester in which offered
Aeronautical Engineering	First

1. RATIONALE

Students are intended to know about the basic concepts and principles of mathematics as a tool to analyze the Engineering Problem. Mathematics has the potential to understand the Core Technological studies.

2. COMPETENCY

Aim to develop the different types of mathematical skills leading to the achievement of the competencies:

Students will be able to apply the concepts and principles of mathematics to solve simple engineering problems

3. TEACHING AND EXAMINATION SCHEME.

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				Total Marks
				Theory Marks		Practical Marks		
L	T	P	C	ESE	PA	ESE	PA	100
03	02	00	5	70	30	00	00	

Legends: L-Lecture; T – Tutorial/Teacher Guided Theory Practice; P -Practical; C – Credit,ESE -End Semester Examination; PA - Progressive Assessment.

4. COURSE DETAILS.

Unit	Outcomes (in cognitive domain)	Major Learning Topics and Sub-topics
Unit – I Logarithm	1.1 Students will be able to solve simple problems Using concepts of Logarithms	1.1 Concept , Rules and related Examples. Solve simple problems using concepts of Logarithms

Unit	Outcomes (in cognitive domain)	Major Learning Topics and Sub-topics
Unit– II Determinants and Matrices	2.1 Students will be able Solve simultaneous equations using concepts of Determinants and Matrices	2.1 Idea of Determinant and Matrix 2.2 Types of Matrices 2.3 Addition/Subtraction ,Product, Inverse of matrices (up to 3X3 matrix) 2.4 Solution of Simultaneous Linear Equations(up to three variables)
Unit– III Trigonometry	3.1 Students will be able Solve simple problems using concepts of Trigonometry	3.1 Measures of Angles (transformation from degree to radian and radian to degree) 3.2 Allied & Compound Angles 3.3 Graph of Sine and Cosine 3.4 Periodic functions 3.5 Sum and Factor formulae 3.6 Multiple – Submultiples angles 3.7 Inverse trigonometric function
Unit– IV Sequences and Series	4.1 Students will be able Solve simple problems using concepts of Sequences and series	4.1 Introduction 4.2 Arithmetic Progression 4.3 Arithmetic Series 4.4 Geometric Progression 4.5 Geometric Series 4.6 Arithmetic Mean and Geometric Mean.
Unit– V Vectors	5.1 Students will be able Solve simple problems using concepts of Vectors	5.1 Basic concept of Vector and Scalar 5.2 Addition & Subtraction of Vectors 5.3 scalar and vector Product 5.4 Geometric meaning of Scalar and Vector Product 5.5 Angle between two vectors 5.6 Applications of Dot (scalar) and Cross (vector) Product 5.7 Work done and Moment of Force.
Unit – VI Co-ordinate Geometry	6.1. Find the distance between two points, use Mid-Point formula for quadrilateral 6.2 Find the equation of locus using Distance Formula 6.3 Find the equation of line using the different forms 6.4 Find the equation of circle 6.5 Find Tangent and Normal to the circle	6.1 Point : 6.1.1 Distance Formula 6.1.2 Mid-point 6.1.3 Locus of a point 6.2 Straight Line : 6.2.1 Forms of Equation of St Lines 6.2.2 Slope Point Form 6.2.3 Two Point Form 6.2.4 Intercept Form 6.2.5 Parallel and Perpendicular lines 6.3 Circle : 6.3.1 Equation of Circle 6.3.2 Centre and radius form 6.3.3 General form of circle 6.3.4 Tangent and Normal and related problems.

Unit	Outcomes (in cognitive domain)	Major Learning Topics and Sub-topics
Unit-VII Mensuration	7.1 Students will be able Calculate the area,surface area ,volume and capacity of 2D & 3D shapes and bodies.	7.1 Area of Triangle, Square, Rectangle, Trapezium, Parallelogram, Rhombus and Circle 7.2 Surface Area & Volume of Cuboids, Cone, Cylinder and Sphere, Capacity of solids.

5. SUGGESTED SPECIFICATION TABLE WITH HOURS AND MARKS (THEORY).

Unit No.	Unit Title	Teaching Hours 42	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Logarithm	05	2	4	2	8
II	Determinants and Matrices	08	4	6	4	14
III	Trigonometry	07	4	4	4	12
IV	Sequences and Series	05	2	4	2	8
V	Vectors	05	2	2	4	8
VI	Co-ordinate Geometry	07	4	4	4	12
VII	Mensuration	05	2	2	4	8
Total		42	20	26	24	70

Legends: R = Remember U= Understand; A= Apply and above levels (Bloom's revised taxonomy).

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

General Notes:

- If midsem test is part of continuous evaluation, unit numbers I and II are to be considered.
- Ask the questions from each topic as per marks weightage. Numerical questions are to be asked only if it is specified. Optional questions must be asked from the same topic.
- In examination, example of same chapter is to be asked in place of example.

6. SUGGESTED LIST OF EXERCISES (During tutorials hours)

Sr. No.	Unit No.	Practical Exercises (outcomes in Psychomotor Domain)	Teaching Hours
1	1	Logarithms-Simple Examples related Definition and Rules	02
2	2	Determinants, Simple Examples on Matrix Addition/Subtraction and Product Co-factors, Adjoint and Inverse of Matrix	02
3		Solution of Simultaneous Equation using 3X3 Matrix and its Applications	02
4	3	Practice Examples: Allied & Compound Angles	02

5		Practice Examples: Periodic functions, Sum/Diff and factor formulae, Inverse Trigonometric function etc.	02
6		Simple Graphs of Sine and Cosine Functions(Explain Spherical Trigonometry, if possible, for Applications)	02
7	4	Practice Examples: Arithmetic Progression, Arithmetic Series, Geometric Progression, Geometric series	02
8		Practice Examples: Arithmetic Mean and Geometric Mean	02
9	5	Practice Simple Examples Vectors	02
10	6	Example related to Dot and Cross Products and Application of Vectors	02
11		Co-ordinate Geometry, Practice Examples	02
12		Solve engineering problems using coordinate geometry	02
13	7	Examples on Area	02
14		Surface Area & Volume and its Applications	02
Total			28

Notes: The above tutor sessions are for guideline only. The remaining tutorial hours are for revision and practice.

7. SUGGESTED LIST OF STUDENT ACTIVITIES.

Following is the list of proposed student activities like: course/topic based seminars, internet based assignments, teacher guided self learning activities, course/library/internet/lab based Mini-Projects etc.

These could be individual or group-based.

1. Applications to solve identified Engineering problems and use of Internet.
2. Tutorials to do more practice of different problems

8. SUGGESTED LEARNING RESOURCES.

A. List of Books

S.No.	Author	Title of books	Publication
1	Anthony croft and others	Engineering Mathematics (third edition)	Pearson Education
2	W R Neelkanth	Applied Mathematics-I	Sapna Publication
3	S P Deshpande	Polytechnic Mathematics	Pune Vidyarthi Gruh Prakashan

B. List of Major Equipment/ Instrument

1. Simple Calculator
2. Computer System with Printer, Internet
3. LCD Projector

9. COURSE CURRICULUM DEVELOPMENT COMMITTEE:

Faculty Members from Polytechnics

Coordinator and Faculty Member From NITTTR Bhopal

