LESSON PLAN
ENGINEERING MATHEMATICS-I

PREPARED BY
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(LECTURER IN MATHEMATICS)

GOVERNMENT POLYTECHNIC BARGARH

DEPARTMENT OF MATHEMATICS & SCIENCE

GOVERNMENT POLYTECHNIC BARGARH

VISION

To be a reputed polytechnic institute imparting quality technical education to produce diploma engineers with dynamic personalities and innovative competencies in the state of Odisha.

MISSION

- To offer the best and advanced lab facilities adhering to the curriculum to make future engineers.

- To engage highly qualified and competent faculties to make the student acquire the skillful knowledge required.

- To develop an excellent teaching learning environment leading to create the best institute.

SYLLABUS

NAME OF THE COURSE: ENGINEERING MATHEMATICS-I			
COURSE CODE	TH-3	SEMESTER	1ST
TOTAL PERIOD	75	EXAMINATION	3 Hrs
THEORY PERIOD	5P/Week +1T/Week	CLASS TEST	20
MAXIMUM MARKS	100	END SEMESTER EXAMINATION	80

COURSE OBJECTIVE:

1. This subject helps the students to develop logical thinking which is useful incomprehending the principles of all to the subjects.
2. Analytical and systematic approach towards any problem is developed through learningof this subject.
3. Mathematics being a versatile subject can be used at every stage of human life.

TOPIC WISE DISTRIBUTION OF PERIODS AND MARKS:

Sl. No.	Subject	Unit	Topic	Periods
A	Algebra	1	Matrices and Determinant	18
B	Trigonometry	2	Trigonometry	15
C	Two Dimensional Geometry	3	Co-ordinate Geometry in Two Dimensions (Straight Line)	13
		4	Circle	07
D	Three Dimensional Geometry	5	Co-ordinate Geometry in Three Dimensions	15
		6	Sphere	07
			TOTAL	75

COURSE CONTENTS:

1) MATRICES AND DETERMINANTS
a) Types of matrices
b) Algebra of matrices
c) Determinant
d) Properties of determinant
e) Inverse of a matrix (second and third order)
   (Question should be on second order matrix)
f) Cramer's Rule (Question should be on two variables)
g) Solution of simultaneous equations by matrix inverse method(Question should be on two variables)

2) TRIGONOMETRY
a) Trigonometrical ratios
b) Compound angles, multiple and sub-multiple angles (only formulae)
c) Define inverse circular functions and its properties (no derivation)

3) CO-ORDINATE GEOMETRY IN TWO DIMENSIONS   (Straight line)
a) Introduction of geometry in two dimension
b) Distance formulae, division formulae, area of a triangle (only formulae no derivation)
c) Define slope of a line, angle between two lines (only F),
   condition of perpendicularity and parallelism.
d) Different forms of straight lines (only formulae)
   i) One point form (ii) two point form (iii) slope form (iv) intercept form
   (v) Perpendicular form
e) Equation of a line passing through a point and (i) parallel to a line
   (ii) Perpendicular to a line
f) Equation of a line passing through the intersection of two lines
g) Distance of a point from a line

4) CIRCLE
a) Equation of a circle
 (i) center radius form
   (ii) general equation of a circle
   (iii) end point of diameter form

5) CO-ORDINATE GEOMETRY IN THREE DIMENSIONS
a) Distance formulae, section formulae, direction ratio, direction cosine,
   angle between two lines (condition of parallelism and perpendicularity)
b) Equation of a plane
i) General form, angle between two planes, perpendicular distance of a
   pointfrom a plane, equation of a plane passing through a point and
i) parallel to a plane (ii) perpendicular to a plane

6) SPHERE
a) Equation of a sphere
   i) center radius form
   ii) general form
   iii) two end points of a diameter form (only formulae and problems)

Books Recommended:
1. Elements of Mathematics- Vol. -1 & 2 (Odisha State Bureau of Text Book preparation & Production)

Reference Books:
1. Mathematics Part- I & Part- II- Textbook for Class XII, NCERT Publication

Syllabus to be covered up to IA

Ch.1, Ch, 2, and Ch,3,(a, b, c)

COURSE OUT COME:-

AFTER COMPLETION OF THE COURSE, THE STUDENTS WILL BE ABLE TO

1. Solve the problems on simultaneous system of linear equations by matrix method and Cramer's rule.
2. Apply various concept of trigonometric and inverse trigonometric function to solve different types of Engineering Problems.
3. Understand the connection between algebra & geometry with the use of graphs of lines and curves.
4. Locate an object in a space through co-ordinate planes & able to know equation of a plane and their applications.

Discipline: Basic Sc. & Humanities Sub: Engineering Mathematics-I(TH3)	Semester: 1 ST SESSION-WINTER 2022 No of Days/weeks-06 Total Class allotted-75	Name of the Teaching faculty: Jitendra Kumar Malik, Lecturer in Mathematics
Week	Class Day	Theory Topics.
1ST	26-10-2022	Definition of matrix, Order of Matrices, Example of Matrices.
	27-10-2022	Types of Matrices.
	27-10-2022	Algebra of Matrices (addition, subtraction, multiplication).
	28-10-2022	Determinant of a 2x2 & 3x3 matrix.
	29-10-2022	Properties of Determinant.
	31-10-2022	Discussion of Probable questions and answers.
2 ND	02-11-2022	Inverse of a matrix of order (2x2 & 3X3),
	03-11-2022	Example of finding the inverse of a matrix.
	03-11-2022	Solution of system of linear equations by Matrix method
	04-11-2022	Problems on Matrix Methods
	05-11-2022	Problems
3 RD	07-11-2022	Discussion of Probable questions and answers.
	09-11-2022	Solution of system of linear equations by Cramer's Rule
	10-11-2022	Problems on Cramer's Rule
	10-11-2022	Problems
	11-11-2022	Calculating the determinant without expansion methods
	12-11-2022	Problems
4TH	14-11-2022	Discussion of Probable questions and answers.
	16-11-2022	Trigonometrical ratios
	17-11-2022	Basic formulae
	17-11-2022	Problems
	18-11-2022	Compound angles and their basic formulae
	19-11-2022	Problems
5TH	21-11-2022	Discussion of Probable questions and answers.
	23-11-2022	Multiple & sub multiple angles and their formulae
	24-11-2022	Problems
	24-11-2022	Inverse trigonometric functions and their formulae
	25-11-2022	Problems on Inverse trigonometric functions
	26-11-2022	Problems on Inverse trigonometric functions
6 TH	28-11-2022	Discussion of Probable questions and answers.
	30-11-2022	Introduction of geometry in two dimension, Distance formula,
	01-12-2022	Problems
	01-12-2022	Division formula, area of a triangle formula
	02-12-2022	Problems
	03-12-2022	Slope of a line and their examples
7 TH	05-12-2022	Discussion of Probable questions and answers.
	07-12-2022	Angle between two lines, conditions for parallelism and perpendicularity
	08-12-2022	Problems
	08-12-2022	General form of an equation of straight line , Different types of straight lines(only formulae)
	09-12-2022	Problems
	10-12-2022	Problems
8 TH	12-12-2022	Discussion of Probable questions and answers.
	14-12-2022	Calculating equation of a line passing through a point, parallel to a line, perpendicular to a line
	15-12-2022	Problems
	15-12-2022	Equations of line passing through the intersection of two line
	16-12-2022	Problems
	17-12-2022	Distance between two parallel lines, distance from a point to the line
9 TH	19-12-2022	Discussion of Probable questions and answers.
	21-12-2022	Definition of circle, equation of circle in 2D plane
	22-12-2022	An equation of circle if center and radius is given and if two end point of diameter is given.
	22-12-202	Finding the center and radius of a circle.
	23-12-202	Equation of circle passing through 3 different points
	24-12-2022	Problems
	26-12-2022	Discussion of Probable questions and answers.

	28-12-2022	Introduction of geometry in three dimension and Distance formula
10TH	29-12-2022	Problems
	29-12-2022	Section formula & related problems
	30-12-2022	Direction ratios and direction cosines
	31-12-2022	Problems
	02-01-2023	Discussion of Probable questions and answers.
	04-01-2023	Equation of planes, general form of an equation of planes
	05-01-203	Angle between two planes, conditions for parallelism and perpendicularity
11TH	05-01-2023	Equations of plane passing through the intersection of two plane
	06-01-2023	Problems
	07-01-2023	Distance between two parallel planes, distance from a point to the plane
	09-01-2023	Discussion of Probable questions and answers.
	11-01-2023	Definition of Sphere, equation of Sphere in 3D plane
	12-01-2023	An equation of Sphere if center and radius is given and if two end point of diameter is given.
12TH	12-01-2023	Finding the center and radius of a Sphere.
	13-01-2023	Equation of Sphere passing through 4 different points.
	16-01-2023	Problems
	18-01-203	Discussion of Probable questions and answers.
	19-01-2023	Discussion of Probable questions and answers.
13 TH	19-01-2023	Discussion of Probable questions and answers.
	20-01-2023	Discussion of Probable questions and answers.
	21-01-2023	Discussion of Probable questions and answers.
	25-01-2023	Discussion of Probable questions and answers.
	27-01-2023	Discussion of Probable questions and answers.
	28-01-203	Discussion of Probable questions and answers.
	30-01-2023	Discussion of Probable questions and answers.
14 TH	01-02-2023	Discussion of Probable questions and answers.
	02-02-2023	Discussion of Probable questions and answers.
	02-02-2023	Discussion of Probable questions and answers.
	03-02-2023	Discussion of Probable questions and answers.
	04-02-2023	Discussion of Probable questions and answers.
	06-02-2023	Discussion of Probable questions and answers.
	08-02-2023	Discussion of Probable questions and answers.
15TH	09-02-2023	Discussion of Probable questions and answers.
	09-02-2023	Discussion of Probable questions and answers.
	10-02-2023	Discussion of Probable questions and answers.
	11-02-2023	Discussion of Probable questions and answers.
	13-02-2023	Discussion of Probable questions and answers.
16TH	15-02-2023	Discussion of Probable questions and answers.
	16-02-2023	Discussion of Probable questions and answers.
	16-02-2023	Discussion of Probable questions and answers.
	17-02-2023	Discussion of Probable questions and answers.
17	20-02-2023	Discussion of Probable questions and answers.

Jitendra 20/10/22

Signature of the faculty

Signature of the HOD 20/10/22