CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : A
Semester : 2

Branch Name: CIVIL
Subject Name: TH 2B : Engineering Chemistry
Teacher Name: SANGITA PANI

Credit '3' External Evaluation(Marked) '100' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Text book of intermediate Chemistry Part 1 & part 2 by Nanda,Das,Sharma,Kalyani Publishers
2	Engg. Chemistry by B.K Sharma Krishna Prakashan Media Pvt. Ltd.

Reference books:

Sl.No	Reference books
1	Engg.Chemistry by Y.R. SHARMA, Krishna Prakashan Media Pvt.Ltd
2	Engg.Chemistry for Diploma -Dr. R K Mohapatra,PHI Publication,New Delhi.
3	Engg.Chemistry - Jain & Jain, Dhanpat Roy and Sons.

Course Outcomes:

Sl.No	Course Outcomes
1	The students will be able to acquire knowledge in structure, bonding ,hybridization concept of acid and bases of different comp
2	Understand various uses and processes of Metallurgy and composition of Alloys
3	To Analyze and Apply the basic concepts of Hydrocarbons , IUPAC nomenclature and uses of aromatic compounds
4	Students will be able To Develop innovative methods for water treatment and uses of Polymers and Bio fertilizers

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	BASIC CONCEPT OF CHEMISTRY,	Cos 1	
2	2	1	FUNDAMENTAL PARTICLES	Cos 1	
3	3	1	RUTHERFORD'S ATOMIC MODEL	Cos 1	
4	4	1	ATOMIC MASS AND MASS NUMBER	Cos 1	
5	5	1	PROPERTIES OF ISOTOPES, ISOBARS, ISOTONES	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
6	6	1	BOHR'S ATOMIC MODEL	Cos 1	
7	7	1	AUFBAU'S PRINCIPLE, HUND'S RULE, ELECTRONIC CONFIGURATION	Cos 1	
8	8	1	IONIC BOND , COVALENT BOND,	Cos 1	
9	9	1	CO-ORDINATE BOND	Cos 1	
10	10	1	CONCEPT OF ACID BASE THEORY	Cos 1	
11	11	1	ARRHENIOUS THEORY FOR ACID AND BASES	Cos 1	
12	12	1	BRONSTED-LOWRY THEORY FOR ACID AND BASES	Cos 1	
13	13	1	LEWIS THEORY FOR ACID AND BASES	Cos 1	
14	14	1	DEFINITION OF SALT, TYPES OF SALT	Cos 1	
15	15	1	ATOMIC WEIGHT, MOLECULARWEIGHT, EQUIVALENT WEIGHT	Cos 1	
16	16	1	NORMALITY, MOLARITY, MOLALITY WITH PROBLEMS	Cos 1	
17	17	1	IMPORTANCE OF PH IN INDUSTRY	Cos 1	
18	18	1	INTRODUCTION OF ELECTROCHEMISTRY	Cos 1	
19	19	1	ELECTROLYSIS WITH EXAMPLE OF NaCl	Cos 1	
20	20	1	FARADAY'S LAW, ELECTROPLATING	Cos 1	
21	21	1	DEFINITION OF CORROSION, TYPES OF CORROSION,PROTECTION OF CORROSION	Cos 1	
22	22	1	WATERLINE	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			CORROSION, MECHANISM OF RUSTING OF IRON ONLY		
23	23	2	INTRODUCTION OF METALLURGY	Cos 2	
24	24	2	ORE DRESSING,	Cos 2	
25	25	2	CONCENTRATION, OXIDATION	Cos 2	
26	26	2	REDUCTION, REFINING OF METAL	Cos 2	
27	27	2	DEFINITION OF ALLOY , TYPES OF ALLOYS	Cos 2	
28	28	2	COMPOSITION AND USES OF BRASS,BRONZE,ALNICO,DURA LUMIN	Cos 2	
29	29	2	ALNICO,	Cos 2	
30	30	2	DURALUMIN	Cos 2	
31	31	3	BASIC CONCEPT OF ORGANIC CHEMISTRY	Cos 3	
32	32	3	SATURATED HYDROCARBON	Cos 3	
33	33	3	UNSATURATED HYDROCARBON	Cos 3	
34	34	3	ALIPHATIC HYDROCARBON	Cos 3	
35	35	3	NOMENCLATURE OF ALKANE	Cos 3	
36	36	3	NOMENCLATURE OF ALKENE	Cos 3	
37	37	3	NOMENCLATURE OF ALKYNE	Cos 3	
38	38	3	NOMENCLATURE OF ALKYL HALIDE	Cos 3	
39	39	3	NOMENCLATURE OF ALCOHOL	Cos 3	
40	40	3	USES OF SOME COMMON AROMATIC COMPOUNDS	Cos 3	
41	41	4	SOURCE OF WATER,SOFT AND HARD WATER	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
42	42	4	TYPES OF HARDNESS	Cos 4	
43	43	4	REMOVAL OF HARDNESS BY LIME SODA METHOD	Cos 4	
44	44	4	ADVANTAGES OF HOT LIME PROCESS	Cos 4	
45	45	4	ADVANTAGES OF COLD LIME PROCESS	Cos 4	
46	46	4	ORGANIC ION EXCHANGE METHOD	Cos 4	
47	47	4	DEFINITION AND TYPES OF LUBRICANT	Cos 4	
48	48	4	SPECIFIC USES OF LUBRICANT	Cos 4	
49	49	4	DEFINITION AND CLASSIFICATION OF FUELS	Cos 4	
50	50	4	CALORIEFIC VALUE	Cos 4	
51	51	4	SOLID FUEL	Cos 4	
52	52	4	LIQUID FUEL	Cos 4	
53	53	4	GASEOUS FUEL(WATER AND PRODUCER GAS,CNG,LPG)	Cos 4	
54	54	4	DEFINITION AND TYPES OF POYMER	Cos 4	
55	55	4	DIFERRENCE BETWEEN THERMOPLASTIC AND THERMOSETTING POLYMERS	Cos 4	
56	56	4	COMPOSITION AND USES OF PVC AND BAKELITEUSES OF	Cos 4	
57	57	4	VULCANIZED RUBBER	Cos 4	
58	58	4	EXAMPLE AND USES OF PESTICIDES AND INSECTICIDES	Cos 4	
59	59	4	EXAMPLE AND USES OF	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			HERBICIDES AND FUNGICIDES		
60	60	4	USES AND EXAMPLES OF BIO FERTILIZERS	Cos 4	

Sangita Pani
Subject Teacher

HOD

Principal

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : A
Semester : 2

Branch Name: CIVIL
Subject Name: TH 3 : Engineering Mathematics-II
Teacher Name: RANJAN KUMAR SATAPATHY

Credit " External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Elements of Mathematics _ Vol. _ 1 & 2 (Odisha State Bureau of Text Book preparation & Production

Reference books:

Sl.No	Reference books
1	Mathematics Part- I & Part- II- Textbook for Class XII, NCERT Publication

Course Outcomes:

Sl.No	Course Outcomes
1	Students will be able to know the meaning of vectors, and use them when adding and subtracting.. They will be able to learn how
2	Calculate the limit of a function of two variables. Learn how a function of two variables can approach different values at a bou
3	An openended task that is given to all children. The children then attempt this task in their own way and at their own pace, thu
4	Integration is a mathematical technique to calculate the area under a curve. There are multiple methods for integration, of whic
5	understand that physical systems can be described by differential equations. understand the practical importance of solving diff

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
2	2	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
3	3	1	Component form of scalar product , Angle between two vectors	Cos 1	
4	4	1	Scalar and vector projection of a vector on another vector	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
5	5	1	Vector or Cross product of vectors , properties of cross product Right hand screw rule	Cos 1	
6	6	1	Component form of vector product, Geometrical meaning of cross p	Cos 1	
7	7	1	Area of a triangle and parallelogram	Cos 1	
8	8	2	(FUNCTION) Cartesian product of sets and relation on a set and from one set to another, Relation and function	Cos 2	
9	9	2	Types of function- constant fun. , absolute value function , signum Function , etc.	Cos 2	
10	10	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
11	11	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
12	12	2	(LIMIT) limit of a function , working rule to find limit , examples	Cos 2	
13	13	2	Limit formulas for indeterminate forms 0/0 ,infinty/infinity etc	Cos 2	
14	14	2	Limit formulas for indeterminate forms 0/0 ,infinty/infinity etc	Cos 2	
15	15	2	Limit formulas for indeterminate forms 0/0 ,infinty/infinity etc	Cos 2	
16	16	2	Existence of limits (LHL and RHL)	Cos 2	
17	17	2	(CONTINUITY OF A FUNCTION)	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			continuity at a point ,		
18	18	2	Examples of pont of discontinuity , (|x| , [x] etc.)	Cos 2	
19	19	3	Problems on continuity and discontinuity	Cos 3	
20	20	3	(DERIVATIVE) definition , derivative at a point , examples	Cos 3	
21	21	3	Algebra of derivative , Addition , Subtraction , quotient , product rule etc	Cos 3	
22	22	3	Derivative of ex , log x , xn , a x etc.	Cos 3	
23	23	3	Derivative of sin x , cos x , sin ^(-)1 x , cos ^(-1)x , etc.	Cos 3	
24	24	3	Derivative of composite function (Chain Rule) , examples	Cos 3	
25	25	3	More examples on Chain rule	Cos 3	
26	26	3	Methods or Techniques of derivative- parametric form , derivative of Implicit function	Cos 3	
27	27	3	Derivative using log	Cos 3	
28	28	3	Derivative of inverse Trigonometric function	Cos 3	
29	29	3	Derivative of a function w.r.t another function	Cos 3	
30	30	3	(APPLICATION OF DERIVATIVE) Successive differentiation, Higher dervatve related problems	Cos 3	
31	31	3	Partial differential equation of f(x , y) , f(x , y , z)etc.	Cos 3	
32	32	3	Eulers theorem , L 'Hospital Rule	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
33	33	3	More examples on partial derivatives	Cos 3	
34	34	4	(INTEGRATION) Integration as anti-process of derivative - I (integration of sin x , cos x , 1/x , xn , e x etc.)	Cos 4	
35	35	4	Standard integration formulas , Properties of Indefinite integration	Cos 4	
36	36	4	Integration by substitution â€" (integration of tan x ,cot x sec x ,cosec x Etc.	Cos 4	
37	37	4	Integration by algebraic substitution and examples	Cos 4	
38	38	4	Integration by Trigonometric substitution and examples	Cos 4	
39	39	4	Integration by partial fraction	Cos 4	
40	40	4	Integration by by-parts method,	Cos 4	
41	41	4	More examples on integration by partial fraction	Cos 4	
42	42	4	Moe examples on integration by parts (integration of ln x , sin ^(â€" 1) x)	Cos 4	
43	43	4	(DEFINITE INTEGRATION) Properties I , II , II	Cos 4	
44	44	4	Properties of Definite Integration â€" IV , V , VI and applications	Cos 4	
45	45	4	Properties of definite integration VII , VII and applications	Cos 4	
46	46	4	(APPLICATION OF INTEGRATION) Area under a curve	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
47	47	4	Area between curve , Area of Circle , Right angled triangle etc	Cos 4	
48	48	4	Area under two curves	Cos 4	
49	49	4	Area of curves that changes sign	Cos 4	
50	50	5	(DIFFERENTIAL EQUATION) definition , order and degree	Cos 5	
51	51	5	Solution of differential equation , General and Particular sol.	Cos 5	
52	52	5	Differential equation of 1st order and 1st degree , Variable separation method,	Cos 5	
53	53	5	Homogeneous form and solution	Cos 5	
54	54	5	Linear differential equation (linear in y , dy/dx)	Cos 5	
55	55	5	Linear differential equation (linear in x and dx/dy)	Cos 5	
56	56	1	Sample previous year questions and solutions	Cos 1	
57	57	2	Sample previous year questions and solutions	Cos 2	
58	58	3	Sample previous year questions and solutions	Cos 3	
59	59	4	Sample previous year questions and solutions	Cos 4	
60	60	5	Sample previous year questions and solutions	Cos 5	

Subject Teacher

HOD

Principal

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : B
Semester : 2

Branch Name: ELECTRICAL
Subject Name: TH 2B : Engineering Chemistry
Teacher Name: SANGITA PANI

Credit '3' External Evaluation(Marked) '100' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
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2	Engg. Chemistry by B.K Sharma Krishna Prakashan Media Pvt. Ltd.

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2	Understand various uses and processes of Metallurgy and composition of Alloys
3	To Analyze and Apply the basic concepts of Hydrocarbons , IUPAC nomenclature and uses of aromatic compounds
4	Students will be able To Develop innovative methods for water treatment and uses of Polymers and Bio fertilizers

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	BASIC CONCEPT OF CHEMISTRY,	Cos 1	
2	2	1	FUNDAMENTAL PARTICLES	Cos 1	
3	3	1	RUTHERFORD'S ATOMIC MODEL	Cos 1	
4	4	1	ATOMIC MASS AND MASS NUMBER	Cos 1	
5	5	1	PROPERTIES OF ISOTOPES, ISOBARS, ISOTONES	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
6	6	1	BOHR'S ATOMIC MODEL	Cos 1	
7	7	1	AUFBAU'S PRINCIPLE, HUND'S RULE, ELECTRONIC CONFIGURATION	Cos 1	
8	8	1	IONIC BOND , COVALENT BOND,	Cos 1	
9	9	1	CO-ORDINATE BOND	Cos 1	
10	10	1	CONCEPT OF ACID BASE THEORY	Cos 1	
11	11	1	ARRHENIOUS THEORY FOR ACID AND BASES	Cos 1	
12	12	1	BRONSTED-LOWRY THEORY FOR ACID AND BASES	Cos 1	
13	13	1	LEWIS THEORY FOR ACID AND BASES	Cos 1	
14	14	1	DEFINITION OF SALT, TYPES OF SALT	Cos 1	
15	15	1	ATOMIC WEIGHT, MOLECULARWEIGHT, EQUIVALENT WEIGHT	Cos 1	
16	16	1	NORMALITY, MOLARITY, MOLALITY WITH PROBLEMS	Cos 1	
17	17	1	IMPORTANCE OF PH IN INDUSTRY	Cos 1	
18	18	1	INTRODUCTION OF ELECTROCHEMISTRY	Cos 1	
19	19	1	ELECTROLYSIS WITH EXAMPLE OF NaCl	Cos 1	
20	20	1	FARADAY'S LAW, ELECTROPLATING	Cos 1	
21	21	1	DEFINITION OF CORROSION, TYPES OF CORROSION,PROTECTION OF CORROSION	Cos 1	
22	22	1	WATERLINE	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			CORROSION, MECHANISM OF RUSTING OF IRON ONLY		
23	23	2	INTRODUCTION OF METALLURGY	Cos 2	
24	24	2	ORE DRESSING,	Cos 2	
25	25	2	CONCENTRATION, OXIDATION	Cos 2	
26	26	2	REDUCTION, REFINING OF METAL	Cos 2	
27	27	2	DEFINITION OF ALLOY , TYPES OF ALLOYS	Cos 2	
28	28	2	COMPOSITION AND USES OF BRASS,BRONZE,ALNICO,DURALUMIN	Cos 2	
29	29	2	ALNICO,	Cos 2	
30	30	2	DURALUMIN	Cos 2	
31	31	3	BASIC CONCEPT OF ORGANIC CHEMISTRY	Cos 3	
32	32	3	SATURATED HYDROCARBON	Cos 3	
33	33	3	UNSATURATED HYDROCARBON	Cos 3	
34	34	3	ALIPHATIC HYDROCARBON	Cos 3	
35	35	3	NOMENCLATURE OF ALKANE	Cos 3	
36	36	3	NOMENCLATURE OF ALKENE	Cos 3	
37	37	3	NOMENCLATURE OF ALKYNE	Cos 3	
38	38	3	NOMENCLATURE OF ALKYL HALIDE	Cos 3	
39	39	3	NOMENCLATURE OF ALCOHOL	Cos 3	
40	40	3	USES OF SOME COMMON AROMATIC COMPOUNDS	Cos 3	
41	41	4	SOURCE OF WATER,SOFT AND HARD WATER	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
42	42	4	TYPES OF HARDNESS	Cos 4	
43	43	4	REMOVAL OF HARDNESS BY LIME SODA METHOD	Cos 4	
44	44	4	ADVANTAGES OF HOT LIME PROCESS	Cos 4	
45	45	4	ADVANTAGES OF COLD LIME PROCESS	Cos 4	
46	46	4	ORGANIC ION EXCHANGE METHOD	Cos 4	
47	47	4	DEFINITION AND TYPES OF LUBRICANT	Cos 4	
48	48	4	SPECIFIC USES OF LUBRICANT	Cos 4	
49	49	4	DEFINITION AND CLASSIFICATION OF FUELS	Cos 4	
50	50	4	CALORIEFIC VALUE	Cos 4	
51	51	4	SOLID FUEL	Cos 4	
52	52	4	LIQUID FUEL	Cos 4	
53	53	4	GASEOUS FUEL(WATER AND PRODUCER GAS,CNG,LPG)	Cos 4	
54	54	4	DEFINITION AND TYPES OF POYMER	Cos 4	
55	55	4	DIFERRENCE BETWEEN THERMOPLASTIC AND THERMOSETTING POLYMERS	Cos 4	
56	56	4	COMPOSITION AND USES OF PVC AND BAKELITEUSES OF	Cos 4	
57	57	4	VULCANIZED RUBBER	Cos 4	
58	58	4	EXAMPLE AND USES OF PESTICIDES AND INSECTICIDES	Cos 4	
59	59	4	EXAMPLE AND USES OF	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			HERBICIDES AND FUNGICIDES		
60	60	4	USES AND EXAMPLES OF BIO FERTILIZERS	Cos 4	

Subject Teacher

HOD

Principal

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : B
Semester : 2

Branch Name: ELECTRICAL
Subject Name: TH 3 : Engineering Mathematics-II
Teacher Name: SUCHITRA SRICHANDAN

Credit '3' External Evaluation(Marked) '100' Internal Evaluation(Marked) '20'

Text Books:

SI.No	Text Books
1	Elements of Mathematics _ Vol. _ 1 & 2 (Odisha State Bureau of Text Book preparation & Production

Reference books:

SI.No	Reference books
1	Mathematics Part- I & Part- II- Textbook for Class XII, NCERT Publication

Course Outcomes:

SI.No	Course Outcomes
1	Students will be able to know the meaning of vectors, and use them when adding and subtracting.. They will be able to learn how
2	Calculate the limit of a function of two variables. Learn how a function of two variables can approach different values at a bou
3	An openended task that is given to all children. The children then attempt this task in their own way and at their own pace, thu
4	Integration is a mathematical technique to calculate the area under a curve. There are multiple methods for integration, of whic
5	understand that physical systems can be described by differential equations. understand the practical importance of solving diff

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
2	2	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
3	3	1	Component form of scalar product , Angle between two vectors	Cos 1	
4	4	1	Scalar and vector projection of a vector	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			on another vector		
5	5	1	Vector or Cross product of vectors , properties of cross product Right hand screw rule	Cos 1	
6	6	1	Component form of vector product, Geometrical meaning of cross p	Cos 1	
7	7	1	Area of a triangle and parallelogram	Cos 1	
8	8	2	(FUNCTION) Cartesian product of sets and relation on a set and from one set to another, Relation and function	Cos 2	
9	9	2	Types of function- constant fun. , absolute value function , signum Function , etc.	Cos 2	
10	10	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
11	11	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
12	12	2	(LIMIT) limit of a function , working rule to find limit , examples	Cos 2	
13	13	2	Limit formulas for indeterminate forms $0/0$, $\infty-\infty$, ∞/∞ etc	Cos 2	
14	14	2	Limit formulas for indeterminate forms $0/0$, ∞/∞ etc	Cos 2	
15	15	2	Limit formulas for indeterminate forms $0/0$, $\infty-\infty$, ∞/∞ etc (three)	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
16	16	2	Existence of limits (LHL and RHL)	Cos 2	
17	17	2	(CONTINUITY OF A FUNCTION) continuity at a point ,	Cos 2	
18	18	2	Examples of pont of discontinuity , (|x| , [x] etc.)	Cos 2	
19	19	2	Problems on continuity and discontinuity	Cos 2	
20	20	3	(DERIVATIVE) definition , derivative at a point , examples	Cos 2	
21	21	3	Algebra of derivative , Addition , Subtraction , quotient , product rule etc	Cos 3	
22	22	3	Derivative of ex , log x , xn , a x etc.	Cos 3	
23	23	3	Derivative of sin x , cos x ,,,,,, , sin − 1 x , cos − 1x , etc.	Cos 3	
24	24	3	Derivative of composite function (Chain Rule) , examples	Cos 3	
25	25	3	More examples on Chain rule	Cos 3	
26	26	3	Methods or Techniques of derivative- parametric form , derivative of Implicit function	Cos 3	
27	27	3	Derivative using log	Cos 3	
28	28	3	Derivative of inverse Trigonometric function	Cos 3	
29	29	3	Derivative of a function w.r.t another function	Cos 3	
30	30	3	(APPLICATION OF DERIVATIVE) Successive differentiation, Higher dervatve related problems	Cos 3	
31	31	3	Partial differential	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			equation of f(x , y) , f(x , y , z)etc.		
32	32	3	Euler's theorem , L ' Hospital Rule	Cos 3	
33	33	3	More examples on partial derivatives	Cos 3	
34	34	4	(INTEGRATION) Integration as anti-process of derivative - I (integration of sin x , cos x , 1/x , xn , e x etc.)	Cos 4	
35	35	4	Standard integration formulas , Properties of Indefinite integration	Cos 4	
36	36	4	Integration by substitution – (integration of tan x ,cot x sec x ,cosec x Etc. ? F' / F dx)	Cos 4	
37	37	4	Integration by algebraic substitution and examples	Cos 4	
38	38	4	Integration by Trigonometric substitution and examples	Cos 4	
39	39	4	Integration by partial fraction , (integration of 1/(???? ^2 ? ???? ^2) etc.	Cos 4	
40	40	4	Integration by by-parts method, (integration of ?(???? ^2 + ???? ^2) , ?(???? ^2 ? ???? ^2) , ?(???? ^2 ? ???? ^2) etc ,)	Cos 4	
41	41	4	More examples on integration by partial fraction	Cos 4	
42	42	4	Moe examples on integration by parts (integration of ln x , sin ^(− 1) x)	Cos 4	
43	43	4	(DEFINITE INTEGRATION) Properties I , II , II	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
44	44	4	Properties of Definite Integration – IV , V , VI and applications	Cos 4	
45	45	4	Properties of definite integration VII , VII and applications	Cos 4	
46	46	4	(APPLICATION OF INTEGRATION) Area under a curve	Cos 3	
47	47	4	Area between curve , Area of Circle , Right angled triangle etc	Cos 4	
48	48	4	Area under two curves	Cos 4	
49	49	4	Area of curves that changes sign	Cos 4	
50	50	5	(DIFFERENTIAL EQUATION) definition , order and degree	Cos 5	
51	51	5	Solution of differential equation , General and Particular sol.	Cos 5	
52	52	5	Differential equation of 1st order and 1st degree , Variable separation method,	Cos 5	
53	53	5	Homogeneous form and solution	Cos 5	
54	54	5	Linear differential equation (linear in y , dy/dx)	Cos 5	
55	55	5	Linear differential equation (linear in x and dx/dy)	Cos 4	
56	56	1	Sample previous year questions and solutions	Cos 1	
57	57	2	Sample previous year questions and solutions	Cos 2	
58	58	3	Sample previous year questions and solutions	Cos 3	
59	59	4	Sample previous year questions and solutions	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
60	60	5	Sample previous year questions and solutions	Cos 5	

Suchitra Srichandan
16/02/24
Subject Teacher

HOD

Principal

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : C
Semester : 2

Branch Name: COMPUTER SCIENCE
Subject Name: TH 1A : Communicative English
Teacher Name: SUBHALAXMI SAMANTARA

Credit " External Evaluation(Marked) " Internal Evaluation(Marked) "

Text Books:

Sl.No	Text Books
1	Invitation to English, Book-1, (for +2 students), CSHE (2016 reprint), Odisha
2	Invitation to English, Book-2, (for +2 students), CSHE (2016 reprint), Odisha
3	Invitation to English, Book-3, (for +2 students), CSHE (2016 reprint), Odisha
4	Invitation to English, Book-4, (for +2 students), CSHE (2016 reprint), Odisha
5	Communication Skills, Sanjay Kumar and Puspalata, Oxford University Press

Reference books:

Sl.No	Reference books
1	Invitation to English, Book-2, (for +2 students), CSHE (2016 reprint), Odisha
2	Communication Skills, Sanjay Kumar and Puspalata, Oxford University Press

Course Outcomes:

Sl.No	Course Outcomes
1	KNOWLEDGE ABOUT WHOLE LITERURE APPRECIATION SUCH AS NOTE MAKING ,SUMMERIZING ETC AND STORY AND POEM
2	USES OF SYNONYMS , ANTONYMS & SINGLE WORD SUBSTITUTE
3	TENSES, COUNTABLE AND UNCOUNTABLE NOUN ,MODELS, VOICE CHANGE ,ARTICLES & DETERMINERS, SUBJECT - VERB AGREEMENT
4	PARAGRAPH WRITING,NOTICE ,AGENDA,REPORT WRITING ,LETTER,APPLICATION
5	INTRODUCTION TO COMMUNICATION , PROFFESIONAL COMMUNICATION

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	Skimming the gist	Cos 1	
2	2	1	Skimming the gist	Cos 1	
3	3	1	Skimming the gist	Cos 1	
4	4	1	Scanning for necessary information	Cos 1	
5	5	1	Close reading for inference and evaluation	Cos 1	
6	6	1	Main idea and supporting points	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
7	7	1	Main idea and supporting points	Cos 1	
8	8	1	Guessing the meaning of un-familiar words	Cos 1	
9	9	1	Guessing the meaning of un-familiar words	Cos 1	
10	10	1	Note- making	Cos 1	
11	11	1	Note- making	Cos 1	
12	12	1	Summarizing	Cos 1	
13	13	1	Summarizing	Cos 1	
14	14	1	Supplying a suitable title	Cos 1	
15	15	1	Standing Up For Yourself By Yevgeny Yevtushenko	Cos 1	
16	16	1	The Magic Of Teamwork By Sam Pitroda	Cos 1	
17	17	1	The Magic Of Teamwork By Sam Pitroda	Cos 1	
18	18	1	Inchcape Rock By Robert Southey	Cos 1	
19	19	1	To My True Friend By Elizabeth Pinard	Cos 1	
20	20	1	To My True Friend By Elizabeth Pinard	Cos 1	
21	21	2	synonyms	Cos 2	
22	22	2	antonyms	Cos 2	
23	23	2	Same word used in different situations in different meaning	Cos 2	
24	24	2	Same word used in different situations in different meaning	Cos 2	
25	25	2	Single word substitute	Cos 2	
26	26	3	Countable an Uncountable Noun	Cos 3	
27	27	3	Articles and Determiners	Cos 3	
28	28	3	Modal Verbs	Cos 3	
29	29	3	Tenses	Cos 3	
30	30	3	Tenses	Cos 3	
31	31	3	Tenses	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
32	32	3	Voice-change	Cos 3	
33	33	3	Subject-verb Agreement	Cos 3	
34	34	4	Paragraph writing	Cos 4	
35	35	4	Meaning	Cos 4	
36	36	4	Features of Paragraph Writing	Cos 4	
37	37	4	Developing Ideas into Paragraphs	Cos 4	
38	38	4	Notice	Cos 4	
39	39	4	Agenda	Cos 4	
40	40	4	Report writing	Cos 4	
41	41	4	Writing personal letter	Cos 4	
42	42	4	Letter to the Principal, Librarian	Cos 4	
43	43	4	Letter toHead of the Deptt, and Hostel Superintenden	Cos 4	
44	44	4	Writing Business letters	Cos 4	
45	45	4	Layout of a Business Letter	Cos 4	
46	46	4	Letter of Enquiry, Placing an Order, Execution of an Order, Complaint, Cancellation of an order	Cos 4	
47	47	4	Job application and C.V.	Cos 4	
48	48	4	Job application and C.V.	Cos 4	
49	49	5	Meaning, Definition and concept of communication	Cos 5	
50	50	5	Good Communication and Bad Communication	Cos 5	
51	51	5	Communication model	Cos 5	
52	52	5	Process of communication and factors responsible for it	Cos 5	
53	53	5	Meaning of professional communication	Cos 5	
54	54	5	Types of professional	Cos 5	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			communication		
55	55	5	Formal or Systematic Communication	Cos 5	
56	56	5	Informal communication	Cos 5	
57	57	5	Meaning of nonverbal Communication	Cos 5	
58	58	5	Different areas of Non-verbal Communication	Cos 5	
59	59	5	Kinesics or Body Language & Proxemics or Spatial Language	Cos 5	
60	60	5	Language of Signs and Symbols	Cos 5	

Subject Teacher   **HOD**   **Principal**

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR, KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : C
Semester : 2

Branch Name: COMPUTER SCIENCE
Subject Name: TH 2A : Engineering Physics
Teacher Name: NAYAN MEHER

Credit '02' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Engineering Physics for Diploma by Ranjan Kumar Bhuyan, PHI Private Ltd. New Delhi
2	Text book of physics for XI (part -I, Part-II), N.C.E.R.T
3	Text book of physics for XII (part -I, Part-II), N.C.E.R.T

Reference books:

Sl.No	Reference books
1	Applied Physics-I (English) Author Name-Prof. Vinod Kumar Yadav
2	Optical fibre communications by GERD KEISER, MGH publication .
3	Electronic communication Systems, by George kennedy, Tata McGraw Hill
4	An Introduction to Fiber Optics. By Ajoy K. Ghatak, K. Thyagarajan, Cambridge University Press.

Course Outcomes:

Sl.No	Course Outcomes
1	Estimate errors in measurement of physical quantities.
2	Students will be able to Apply laws of motion in various applications and Calculate effects of gravitational force on planets.
3	Comprehend concept of Heat, Temperature and and their effects on Solids, Acquire knowledge on properties of light.
4	Apply Coulomb's law to calculate electrostatics force, electric field and electric potential.
5	Use basic principles of light, X-rays, Laser and Fibre optics in related engineering problems.

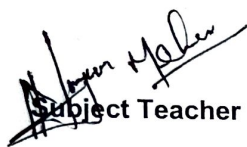| SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	I	Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units)	Cos 1	
2	2	I	Definition of dimension and Dimensional formulae of physical quantities	Cos 1	
3	3	I	Dimensional equations and	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Principle of homogeneity		
4	4	II	Scalar and Vector quantities	Cos 1	
5	5	II	Resolution of Vectors	Cos 1	
6	6	II	Vector multiplication	Cos 1	
7	7	III	Concept of Rest and Motion, Displacement, Speed, Velocity, Acceleration & Force	Cos 2	
8	8	III	Equations of Motion under GravityCircular motion: Angular displacement, Angular velocity and Angular acceleration	Cos 2	
9	9	III	Circular motion: Angular displacement, Angular velocity and Angular accelerationLinear & Angular velocity	Cos 2	
10	10	III	Relation between Linear & Angular acceleration	Cos 2	
11	11	III	Projectile, Expression for Equation of Trajectory	Cos 2	
12	12	III	Time of Flight, Maximum Height	Cos 2	
13	13	III	Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range	Cos 2	
14	14	IV	Definition, Formula & SI units of WORK AND FORCE	Cos 2	
15	15	IV	Static, dynamic & Limiting Friction	Cos 2	
16	16	IV	Laws of Limiting Friction	Cos 2	
17	17	IV	Coefficient of Friction with problems	Cos 2	
18	18	IV	Useful Methods to reduce friction	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
19	19	V	Newton's Laws of Gravitation	Cos 2	
20	20	V	Universal Gravitational Constant (G), Acceleration due to gravity (g)	Cos 2	
21	21	V	Definition of mass and weight& Relation between g and G.	Cos 2	
22	22	V	Variation of g with altitude and depth	Cos 2	
23	23	V	Kepler's Laws of Planetary Motion	Cos 2	
24	24	VI	Simple Harmonic Motion	Cos 3	
25	25	VI	Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM	Cos 3	
26	26	VI	Wave motion Introduction	Cos 3	
27	27	VI	Amplitude, Wavelength, Frequency, Time Period	Cos 3	
28	28	VI	Derivation of Relation between Velocity, Frequency and Wavelength of a wave	Cos 3	
29	29	VI	Introduction to Ultrasonic	Cos 3	
30	30	VII	Heat and Temperature, Units of Heat,Specific heat	Cos 3	
31	31	VII	Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical)	Cos 3	
32	32	VII	Thermal Expansion, Expansion of Solids	Cos 3	
33	33	VII	Coefficient of linear, superficial and cubical expansions of Solids.Definition &	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Units.		
34	34	VII	Relation between ?, ? & ?Relation between ?, ? & ?Relation between ?, ? & ?Relation between ?, ? & ?	Cos 3	
35	35	VII	Work and Heat - Concept & Relation	Cos 3	
36	36	VII	Joule's Mechanical Equivalent of Heat (Definition, Unit) ,First Law of Thermodynamics (Statement and concept only)	Cos 3	
37	37	VIII	Reflection & Refraction, Laws of reflection and refraction	Cos 3	
38	38	VIII	Refractive index, Critical Angle and Total internal reflection	Cos 3	
39	39	VIII	Refraction through Prism (Ray Diagram & Formula only)	Cos 3	
40	40	VIII	Fiber Optics :Definition, Properties & Applications.	Cos 3	
41	41	IX	Electrostatics, Statement & Explanation of Coulombs laws, Definition of Unit charge.	Cos 4	
42	42	IX	Absolute & Relative Permittivity (μ), Electric potential and Electric Potential difference	Cos 4	
43	43	IX	Electric field, Electric field intensity (E) , Capacitance	Cos 4	
44	44	IX	Series and Parallel combination of Capacitors, Magnet, Properties of a	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			magnet.		
45	45	IX	Series and Parallel combination of Capacitors, Magnet, Properties of a magnet	Cos 4	
46	46	IX	Magnetic lines of force	Cos 4	
47	47	IX	Magnetic Flux (?) & Magnetic Flux Density (B)	Cos 4	
48	48	X	Electric Current , Ohm's law and its applications	Cos 4	
49	49	X	Series and Parallel combination of resistors	Cos 4	
50	50	X	Kirchhoff's laws (Statement & Explanation with diagram).	Cos 4	
51	51	X	Application of Kirchhoff?s laws to Wheatstone bridge	Cos 4	
52	52	X	Balanced condition of Wheatstone?s Bridge – Condition of Balance (Equation).	Cos 4	
53	53	XI	Electromagnetism, Force acting on a current carrying conductor placed in a uniform magnetic field	Cos 4	
54	54	XI	Fleming's Left Hand Rule,Fleming?s Right Hand Rule	Cos 4	
55	55	XI	Faraday?s Laws of Electromagnetic Induction, Lenz's law	Cos 4	
56	56	XI	Comparison between Fleming?s Right Hand Rule and Fleming?s Left Hand Rule.	Cos 4	
57	57	XII	LASER & laser beam	Cos 5	
58	58	XII	Principle of LASER (Population Inversion & Optical Pumping)	Cos 5	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
59	59	XII	Properties & Applications of LASER	Cos 5	
60	60	XII	Wireless Transmission – Ground Waves, Sky Waves, Space Waves (Concept & Definition)	Cos 5	

Subject Teacher   **HOD**   **Principal**

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : C
Semester : 2

Branch Name: COMPUTER SCIENCE
Subject Name: TH 3 : Engineering Mathematics-II
Teacher Name: SUCHITRA SRICHANDAN

Credit '3' External Evaluation(Marked) '100' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Elements of Mathematics _ Vol. _ 1 & 2 (Odisha State Bureau of Text Book preparation & Production

Reference books:

Sl.No	Reference books
1	Mathematics Part- I & Part- II- Textbook for Class XII, NCERT Publication

Course Outcomes:

Sl.No	Course Outcomes
1	Students will be able to know the meaning of vectors, and use them when adding and subtracting.. They will be able to learn how
2	Calculate the limit of a function of two variables. Learn how a function of two variables can approach different values at a bou
3	An openended task that is given to all children. The children then attempt this task in their own way and at their own pace, thu
4	Integration is a mathematical technique to calculate the area under a curve. There are multiple methods for integration, of whic
5	understand that physical systems can be described by differential equations. understand the practical importance of solving diff

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
2	2	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
3	3	1	Component form of scalar product , Angle between two vectors	Cos 1	
4	4	1	Scalar and vector projection of a vector	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			on another vector		
5	5	1	Vector or Cross product of vectors , properties of cross product Right hand screw rule	Cos 1	
6	6	1	Component form of vector product, Geometrical meaning of cross p	Cos 1	
7	7	1	Area of a triangle and parallelogram	Cos 1	
8	8	2	(FUNCTION) Cartesian product of sets and relation on a set and from one set to another, Relation and function	Cos 2	
9	9	2	Types of function- constant fun. , absolute value function , signum Function , etc.	Cos 2	
10	10	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
11	11	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
12	12	2	(LIMIT) limit of a function , working rule to find limit , examples	Cos 2	
13	13	2	Limit formulas for indeterminate forms $0/0$, $\infty-\infty$, ∞/∞ etc	Cos 2	
14	14	2	Limit formulas for indeterminate forms $0/0$, ∞/∞ etc	Cos 2	
15 ·	15	2	Limit formulas for indeterminate forms $0/0$, $\infty-\infty$, ∞/∞ etc (three)	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
16	16	2	Existence of limits (LHL and RHL)	Cos 2	
17	17	2	(CONTINUITY OF A FUNCTION) continuity at a point ,	Cos 2	
18	18	2	Examples of pont of discontinuity , (|x| , [x] etc.)	Cos 2	
19	19	2	Problems on continuity and discontinuity	Cos 2	
20	20	2	(DERIVATIVE) definition , derivative at a point , examples	Cos 2	
21	21	3	Algebra of derivative , Addition , Subtraction , quotient , product rule etc.	Cos 3	
22	22	3	Derivative of ex , log x , xn , a x etc.	Cos 3	
23	23	3	Derivative of sin x , cos x ,,,,,, , sin – 1 x , cos – 1x , etc	Cos 3	
24	24	3	Derivative of composite function (Chain Rule) , examplesvvv	Cos 3	
25	25	3	More examples on Chain rule	Cos 3	
26	26	3	Methods or Techniques of derivative- parametric form , derivative of Implicit function	Cos 3	
27	27	3	Derivative using log	Cos 3	
28	28	3	Derivative of inverse Trigonometric function	Cos 3	
29	29	3	Derivative of a function w.r.t another function	Cos 3	
30	30	3	(APPLICATION OF DERIVATIVE) Successive differentiation, Higher dervatve related problems	Cos 3	
31	31	3	Partial differential	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			equation of f(x , y) , f(x , y , z)etc.		
32	32	3	Euler's theorem , L â€˜ Hospital Rule	Cos 3	
33	33	3	More examples on partial derivatives	Cos 3	
34	34	4	(INTEGRATION) Integration as anti-process of derivative - I (integration of sin x , cos x , 1/x , xn , e x etc.)	Cos 4	
35	35	4	Standard integration formulas , Properties of Indefinite integration	Cos 4	
36	36	4	Integration by substitution – (integration of tan x ,cot x sec x ,cosec x Etc. ? F' / F dx)	Cos 4	
37	37	4	Integration by algebraic substitution and examples	Cos 4	
38	38	4	Integration by Trigonometric substitution and examples	Cos 4	
39	39	4	Integration by partial fraction , (integration of 1/(???? ^2 ? ???? ^2) etc.	Cos 4	
40	40	4	Integration by by-parts method, (integration of ?(???? ^2 + ???? ^2) , ?(???? ^2 ? ???? ^2) , ?(???? ^2 ? ???? ^2) etc ,)	Cos 4	
41	41	4	More examples on integration by partial fraction	Cos 4	
42	42	4	Moe examples on integration by parts (integration of ln x , sin^(− 1) x)	Cos 4	
43	43	4	(DEFINITE INTEGRATION) Properties I , II , II	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
44	44	4	Properties of Definite Integration – IV , V , VI and applications	Cos 4	
45	45	4	Properties of definite integration VII , VII and applications	Cos 4	
46	46	4	(APPLICATION OF INTEGRATION) Area under a curve	Cos 4	
47	47	4	Area between curve , Area of Circle , Right angled triangle etc	Cos 4	
48	48	4	Area under two curves	Cos 4	
49	49	4	Area of curves that changes sign	Cos 4	
50	50	5	(DIFFERENTIAL EQUATION) definition , order and degree	Cos 5	
51	51	5	Solution of differential equation , General and Particular sol.	Cos 5	
52	52	5	Differential equation of 1st order and 1st degree , Variable separation method,	Cos 4	
53	53	5	Homogeneous form and solution	Cos 5	
54	54	5	Linear differential equation (linear in y , dy/dx)	Cos 5	
55	55	5	Linear differential equation (linear in x and dx/dy)	Cos 5	
56	56	1	Sample previous year questions and solutions	Cos 1	
57	57	2	Sample previous year questions and solutions	Cos 2	
58	58	3	Sample previous year questions and solutions	Cos 3	
59	59	4	Sample previous year questions and solutions	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
60	60	5	Sample previous year questions and solutions	Cos 5	

Suchitra Srichandan
Subject Teacher 16/02/24

HOD

Principal

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR, KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Subject Name: TH 1A : Communicative English
Section: D
Semester: 2

Branch Name: MECHANICAL
Theory/Practical: Theory
Teacher Name: SUPRAVA RATH

Credit '' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Invitation to English, Book-1, (for +2 students), CSHE (2016 reprint), Odisha
2	Invitation to English, Book-2, (for +2 students), CSHE (2016 reprint), Odisha
3	Invitation to English, Book-3, (for +2 students), CSHE (2016 reprint), Odisha
4	Invitation to English, Book-4, (for +2 students), CSHE (2016 reprint), Odisha
5	Communication Skills, Sanjay Kumar and Puspalata, Oxford University Press

Reference books:

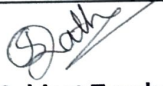| Sl.No	Reference books
1	Invitation to English, Book-2, (for +2 students), CSHE (2016 reprint), Odisha
2	Communication Skills, Sanjay Kumar and Puspalata, Oxford University Press

Course Outcomes:

Sl.No	Course Outcomes
1	KNOWLEDGE ABOUT WHOLE LITERURE APPRECIATION SUCH AS NOTE MAKING ,SUMMERIZING ETC AND STORY AND POEM
2	USES OF SYNONYMS , ANTONYMS & SINGLE WORD SUBSTITUTE
3	TENSES, COUNTABLE AND UNCOUNTABLE NOUN ,MODELS, VOICE CHANGE ,ARTICLES & DETERMINERS, SUBJECT - VERB AGREEMENT
4	PARAGRAPH WRITING,NOTICE ,AGENDA,REPORT WRITING ,LETTER,APPLICATION
5	INTRODUCTION TO COMMUNICATION , PROFFESIONAL COMMUNICATION

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference
1	1	1	Skimming the gist	Cos 1	
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11	11	1	Note- making	Cos 1	
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13	13	1	Summarizing	Cos 1	
14	14	1	Supplying a suitable title	Cos 1	
15	15	1	Supplying a suitable title	Cos 1	
16	16	1	Standing Up For Yourself By Yevgeny Yevtushenko	Cos 1	
17	17	1	The Magic Of Teamwork By	Cos 1	
18	18	1	The Magic Of Teamwork By	Cos 1	
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22	22	2	antonyms	Cos 2	
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24	24	2	Same word used in different situations in different meaning	Cos 2	
25	25	2	Single word substitute	Cos 2	
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27	27	3	Articles and Determiners	Cos 3	
28	28	3	Modal Verbs	Cos 3	
29	29	3	Tenses	Cos 3	
30	30	3	Tenses	Cos 3	
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32	32	3	Voice-change	Cos 3	
33	33	3	Subject-verb Agreement	Cos 3	
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35	35	4	Meaning	Cos 4	
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38	38	4	Notice	Cos 4	
39	39	4	Agenda	Cos 4	
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51	51	5	Communication model	Cos 5	
52	52	5	Process of communication and factors responsible for it	Cos 5	
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54	54	5	Types of professional	Cos 5	
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56	56	5	Informal communication	Cos 5	
57	57	5	Meaning of nonverbal	Cos 5	
58	58	5	Different areas of Non-verbal Communication	Cos 5	
59	59	5	Kinesics or Body Language & Proxemics or Spatial Language	Cos 5	
60	60	5	Language of Signs and Symbols	Cos 5	

Subject Teacher   HOD   **Principal**

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : D
Semester : 2

Branch Name: MECHANICAL
Subject Name: TH 2A : Engineering Physics
Teacher Name: RADHASHYAM MOHANTA

Credit '2' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Engineering Physics for Diploma by Ranjan Kumar Bhuyan, PHI Private Ltd. New Delhi
2	Text book of physics for XI (part -I, Part-II), N.C.E.R.T
3	Text book of physics for XII (part -I, Part-II), N.C.E.R.T

Reference books:

Sl.No	Reference books
1	Applied Physics-I (English) Author Name-Prof. Vinod Kumar Yadav
2	Optical fibre communications by GERD KEISER, MGH publication .
3	Electronic communication Systems, by George kennedy, Tata McGraw Hill
4	An Introduction to Fiber Optics. By Ajoy K. Ghatak, K. Thyagarajan, Cambridge University Press.

Course Outcomes:

Sl.No	Course Outcomes
1	Estimate errors in measurement of physical quantities.
2	Students will be able to Apply laws of motion in various applications and Calculate effects of gravitational force on planets.
3	Comprehend concept of Heat, Temperature and and their effects on Solids, Acquire knowledge on properties of light.
4	Apply Coulomb's law to calculate electrostatics force, electric field and electric potential.
5	Use basic principles of light, X-rays, Laser and Fibre optics in related engineering problems.

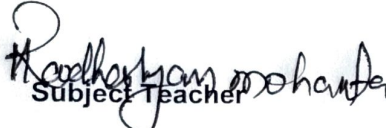| SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	I	Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units)	Cos 1	
2	2	I	Definition of dimension and Dimensional formulae of physical quantities	Cos 1	
3	3	I	Dimensional equations and	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Principle of homogeneity		
4	4	II	Scalar and Vector quantities	Cos 1	
5	5	II	Resolution of Vectors	Cos 1	
6	6	II	Vector multiplication	Cos 1	
7	7	III	Concept of Rest and Motion, Displacement, Speed, Velocity, Acceleration & Force	Cos 2	
8	8	III	Equations of Motion under GravityCircular motion: Angular displacement, Angular velocity and Angular acceleration	Cos 2	
9	9	III	Circular motion: Angular displacement, Angular velocity and Angular accelerationLinear & Angular velocity	Cos 2	
10	10	III	Relation between Linear & Angular acceleration	Cos 2	
11	11	III	Projectile, Expression for Equation of Trajectory	Cos 2	
12	12	III	Time of Flight, Maximum Height	Cos 2	
13	13	III	Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range	Cos 2	
14	14	IV	Definition, Formula & SI units of WORK AND FORCE	Cos 2	
15	15	IV	Static, dynamic & Limiting Friction	Cos 2	
16	16	IV	Laws of Limiting Friction	Cos 2	
17	17	IV	Coefficient of Friction with problems	Cos 2	
18	18	IV	Useful Methods to reduce friction	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
19	19	V	Newton's Laws of Gravitation	Cos 2	
20	20	V	Universal Gravitational Constant (G), Acceleration due to gravity (g)	Cos 2	
21	21	V	Definition of mass and weight& Relation between g and G.	Cos 2	
22	22	V	Variation of g with altitude and depth	Cos 2	
23	23	V	Kepler's Laws of Planetary Motion	Cos 2	
24	24	VI	Simple Harmonic Motion	Cos 3	
25	25	VI	Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM	Cos 3	
26	26	VI	Wave motion Introduction	Cos 3	
27	27	VI	Amplitude, Wavelength, Frequency, Time Period	Cos 3	
28	28	VI	Derivation of Relation between Velocity, Frequency and Wavelength of a wave	Cos 3	
29	29	VI	Introduction to Ultrasonic	Cos 3	
30	30	VII	Heat and Temperature, Units of Heat,Specific heat	Cos 3	
31	31	VII	Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical)	Cos 3	
32	32	VII	Thermal Expansion, Expansion of Solids	Cos 3	
33	33	VII	Coefficient of linear, superficial and cubical expansions of Solids.Definition &	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Units.		
34	34	VII	Relation between ?, ? & ?	Cos 3	
35	35	VII	Work and Heat - Concept & Relation	Cos 3	
36	36	VII	Joule's Mechanical Equivalent of Heat (Definition, Unit) ,First Law of Thermodynamics (Statement and concept only)	Cos 3	
37	37	VIII	Reflection & Refraction, Laws of reflection and refraction	Cos 3	
38	38	VIII	Refractive index, Critical Angle and Total internal reflection	Cos 3	
39	39	VIII	Refraction through Prism (Ray Diagram & Formula only)	Cos 3	
40	40	VIII	Fiber Optics :Definition, Properties & Applications.	Cos 3	
41	41	IX	Electrostatics, Statement & Explanation of Coulombs laws, Definition of Unit charge.	Cos 4	
42	42	IX	Absolute & Relative Permittivity (ÃŽÂµ), Electric potential and Electric Potential difference	Cos 4	
43	43	IX	Electric field, Electric field intensity (E) , Capacitance	Cos 4	
44	44	IX	Series and Parallel combination of Capacitors, Magnet, Properties of a magnet.	Cos 4	
45	45	IX	Series and Parallel combination of Capacitors, Magnet,	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Properties of a magnet		
46	46	IX	Magnetic lines of force	Cos 4	
47	47	IX	Magnetic Flux (?) & Magnetic Flux Density (B)	Cos 4	
48	48	X	Electric Current , Ohm's law and its applications	Cos 4	
49	49	X	Series and Parallel combination of resistors	Cos 4	
50	50	X	Kirchhoff's laws (Statement & Explanation with diagram).	Cos 4	
51	51	X	Application of Kirchhoff's laws to Wheatstone bridge	Cos 4	
52	52	X	Balanced condition of Wheatstone's Bridge " Condition of Balance (Equation).	Cos 4	
53	53	XI	Electromagnetism, Force acting on a current carrying conductor placed in a uniform magnetic field	Cos 4	
54	54	XI	Fleming's Left Hand Rule,Fleming's Right Hand Rule	Cos 4	
55	55	XI	Faraday's Laws of Electromagnetic Induction, Lenz's law	Cos 4	
56	56	XI	Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.	Cos 5	
57	57	XII	LASER & laser beam	Cos 5	
58	58	XII	Principle of LASER (Population Inversion & Optical Pumping)	Cos 5	
59	59	XII	Properties & Applications of LASER	Cos 5	
60	60	XII	Wireless	Cos 5	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Transmission – Ground Waves, Sky Waves, Space Waves (Concept & Definition)		

Subject Teacher

HOD

Principal

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA	**Branch Name:** MECHANICAL
Subject Name: TH 3 : Engineering Mathematics-II	**Theory/Practical:** Theory
Section: D	**Teacher Name:** GYANA RANJAN RATH
Semester: 2	

Credit '3' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Elements of Mathematics _ Vol. _ 1 & 2 (Odisha State Bureau of Text Book preparation & Production

Reference books:

Sl.No	Reference books
1	Mathematics Part- I & Part- II- Textbook for Class XII, NCERT Publication

Course Outcomes:

Sl.No	Course Outcomes
1	Students will be able to know the meaning of vectors, and use them when adding and subtracting.. They will be able to learn how
2	Calculate the limit of a function of two variables. Learn how a function of two variables can approach different values at a bou
3	An openended task that is given to all children. The children then attempt this task in their own way and at their own pace, thu
4	Integration is a mathematical technique to calculate the area under a curve. There are multiple methods for integration, of whic
5	understand that physical systems can be described by differential equations. understand the practical importance of solving diff

SL	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference
1	1	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
2	2	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
3	3	1	Component form of scalar product , Angle between two vectors	Cos 1	

4	4	1	Scalar and vector projection of a vector on another vector	Cos 1	
5	5	1	Vector or Cross product of vectors , properties of cross product Right hand screw rule	Cos 1	
6	6	1	Component form of vector product, Geometrical meaning of cross p	Cos 1	
7	7	1	Area of a triangle and parallelogram	Cos	
8	8	2	(FUNCTION) Cartesian product of sets and relation on a set and from one set to another, Relation and	Cos 2	
9	9	2	Types of function- constant fun. , absolute value function , signum Function , etc.	Cos 2	
10	10	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
11	11	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
12	12	2	(LIMIT) limit of a function , working rule to find limit , examples	Cos 2	
13	13	2	Limit formulas for indeterminate forms 0/0 , âˆž-âˆž, âˆž/âˆž etc	Cos 2	
14	14	2	Limit formulas for indeterminate forms 0/0 , âˆž/âˆž etc	Cos 2	
15	15	2	Limit formulas for indeterminate forms 0/0 , âˆž-âˆž, âˆž/âˆž etc	Cos 2	
16	16	2	Existence of limits (LHL and RHL)	Cos	
17	17	2	(CONTINUITY OF A FUNCTION) continuity at a point ,	Cos 2	
18	18	2	Examples of pont of discontinuity , (|x| , [x] etc.)	Cos 2	
19	19	2	Problems on continuity and discontinuity	Cos 2	
20	20	2	(DERIVATIVE) definition , derivative at a point , examples	Cos 2	
21	21	3	Algebra of derivative , Addition , Subtraction , quotient , product rule etc.	Cos 3	
22	22	3	Derivative of ex , log x , xn , a x etc.	Cos	
23	23	3	Derivative of sin x , cos x ,,,,,, , sin â€“ 1 x , cos â€“ 1x , etc	Cos 3	
24	24	3	Derivative of composite function (Chain Rule) , examplesvvv	Cos 3	
25	25	3	More examples on Chain rule	Cos	

26	26	3	Methods or Technique s of derivative- parametric form , derivative of Implicit function	Cos 3	
27	27	3	Derivative using log	Cos	
28	28	3	Derivative of inverse Trigonometric function	Cos 3	
29	29	3	Derivative of a function w.r.t another function	Cos 3	
30	30	3	(APPLICATION OF DERIVATIVE) Successive differentiation, Higher dervatve related problems	Cos 3	
31	31	3	Partial differential equation of f(x , y), f(x , y , z)etc.	Cos 3	
32	32	3	Euler's theorem , L 'Hospital Rule	Cos 3	
33	33	3	More examples on partial	Cos	
34	34	4	(INTEGRATION) Integration as anti-process of derivative - I (integration of sin x , cos x , 1/x , xn , e x etc.)	Cos 4	
35	35	4	Standard integration formulas , Properties of Indefinite integration	Cos 4	
36	36	4	Integration by substitution – (integration of tan x ,cot x sec x ,cosec x Etc. ∫ F' / F dx)	Cos 4	
37	37	4	Integration by algebraic substitution and examples	Cos 4	
38	38	4	Integration by Trigonometric substitution and examples	Cos 4	
39	39	4	Integration by partial fraction	Cos	
40	40	4	Integration by by-parts method	Cos	
41	41	4	More examples on integration by partial fraction	Cos 4	
42	42	4	Moe examples on integration by parts (integration of ln x , sin ^(-1)	Cos 4	
43	43	4	(DEFINITE INTEGRATION) Properties I , II , II	Cos 4	
44	44	4	Properties of Definite Integration – IV , V , VI and applications	Cos 4	
45	45	4	Properties of definite integration VII , VII and applications	Cos 4	
46	46	4	(APPLICATION OF INTEGRATION) Area under a curve	Cos 4	
47	47	4	Area between curve , Area of Circle , Right angled triangle etc.	Cos 4	
48	48	4	Area under two curves	Cos	
49	49	4	Area of curves that changes sign	Cos	

50	50	5	(DIFFERENTIAL EQUATION) definition , order and degree	Cos 5	
51	51	5	Solution of differential equation , General and Particular sol.	Cos 5	
52	52	5	Differential equation of 1st order and 1st degree , Variable separation method,	Cos 5	
53	53	5	Homogeneous form and solution	Cos	
54	54	5	Linear differential equation (linear in y , dy/dx)	Cos 5	
55	55	5	Linear differential equation (linear in x and dx/dy)	Cos 5	
56	56	5	Sample previous year questions and solutions	Cos 1	
57	57	5	Sample previous year questions and solutions	Cos 2	
58	58	5	Sample previous year questions and solutions	Cos 3	
59	59	5	Sample previous year questions and solutions	Cos 4	
60	60	5	Sample previous year questions and solutions	Cos 5	

Subject Teacher   **HOD**   **Principal**

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA   **Branch Name:** MECHANICAL
Subject Name: TH 1A : Communicative English   **Theory/Practical:** Theory
Section: E   **Teacher Name:** SUPRAVA RATH
Semester: 2

Credit " External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Invitation to English, Book-1, (for +2 students), CSHE (2016 reprint), Odisha
2	Invitation to English, Book-2, (for +2 students), CSHE (2016 reprint), Odisha
3	Invitation to English, Book-3, (for +2 students), CSHE (2016 reprint), Odisha
4	Invitation to English, Book-4, (for +2 students), CSHE (2016 reprint), Odisha
5	Communication Skills, Sanjay Kumar and Puspalata, Oxford University Press

Reference books:

Sl.No	Reference books
1	Invitation to English, Book-2, (for +2 students), CSHE (2016 reprint), Odisha
2	Communication Skills, Sanjay Kumar and Puspalata, Oxford University Press

Course Outcomes:

Sl.No	Course Outcomes
1	KNOWLEDGE ABOUT WHOLE LITERURE APPRECIATION SUCH AS NOTE MAKING ,SUMMERIZING ETC AND STORY AND POEM
2	USES OF SYNONYMS , ANTONYMS & SINGLE WORD SUBSTITUTE
3	TENSES, COUNTABLE AND UNCOUNTABLE NOUN ,MODELS, VOICE CHANGE ,ARTICLES & DETERMINERS, SUBJECT - VERB AGREEMENT
4	PARAGRAPH WRITING,NOTICE ,AGENDA,REPORT WRITING ,LETTER,APPLICATION
5	INTRODUCTION TO COMMUNICATION , PROFFESIONAL COMMUNICATION

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference
1	1	1	Skimming the gist	Cos 1	
2	2	1	Skimming the gist	Cos 1	
3	3	1	Skimming the gist	Cos 1	
4	4	1	Scanning for necessary	Cos 1	
5	5	1	Close reading for inference and evaluation	Cos 1	

6	6	1	Main idea and supporting	Cos 1	
7	7	1	Main idea and supporting	Cos 1	
8	8	1	Guessing the meaning of un-familiar words	Cos 1	
9	9	1	Guessing the meaning of un-familiar words	Cos 1	
10	10	1	Note- making	Cos 1	
11	11	1	Note- making	Cos 1	
12	12	1	Summarizing	Cos 1	
13	13	1	Summarizing	Cos 1	
14	14	1	Supplying a suitable title	Cos 1	
15	15	1	Supplying a suitable title	Cos 1	
16	16	1	Standing Up For Yourself By Yevgeny Yevtushenko	Cos 1	
17	17	1	The Magic Of Teamwork By	Cos 1	
18	18	1	The Magic Of Teamwork By	Cos 1	
19	19	1	Inchcape Rock By Robert	Cos 1	
20	20	1	To My True Friend By	Cos 1	
21	21	2	synonyms	Cos 2	
22	22	2	antonyms	Cos 2	
23	23	2	Same word used in different situations in different meaning	Cos 2	
24	24	2	Same word used in different situations in different meaning	Cos 2	
25	25	2	Single word substitute	Cos 2	
26	26	3	Countable an Uncountable	Cos 3	
27	27	3	Articles and Determiners	Cos 3	
28	28	3	Modal Verbs	Cos 3	
29	29	3	Tenses	Cos 3	
30	30	3	Tenses	Cos 3	
31	31	3	Tenses	Cos 3	
32	32	3	Voice-change	Cos 3	
33	33	3	Subject-verb Agreement	Cos 3	
34	34	4	Paragraph writing	Cos 4	
35	35	4	Meaning	Cos 4	
36	36	4	Features of Paragraph Writing	Cos 4	
37	37	4	Developing Ideas into	Cos 4	
38	38	4	Notice	Cos 4	
39	39	4	Agenda	Cos 4	
40	40	4	Report writing	Cos 4	
41	41	4	Writing personal letter	Cos 4	
42	42	4	Letter to the Principal,	Cos 4	
43	43	4	Letter toHead of the Deptt, and Hostel Superintenden	Cos 4	
44	44	4	Writing Business letters	Cos 4	
45	45	4	Layout of a Business Letter	Cos 4	

46	46	4	Letter of Enquiry, Placing an Order, Execution of an Order, Complaint, Cancellation of an	Cos 4
47	47	4	Job application and C.V.	Cos 4
48	48	4	Job application and C.V.	Cos 4
49	49	5	Meaning, Definition and concept of communication	Cos 5
50	50	5	Good Communication and Bad Communication	Cos 5
51	51	5	Communication model	Cos 5
52	52	5	Process of communication and factors responsible for it	Cos 5
53	53	5	Meaning of professional communication	Cos 5
54	54	5	Types of professional	Cos 5
55	55	5	Formal or Systematic	Cos 5
56	56	5	Informal communication	Cos 5
57	57	5	Meaning of nonverbal	Cos 5
58	58	5	Different areas of Non-verbal Communication	Cos 5
59	59	5	Kinesics or Body Language & Proxemics or Spatial Language	Cos 5
60	60	5	Language of Signs and Symbols	Cos 5

Subject Teacher   **HOD**   **Principal**

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Theory/Practical: Theory
Section : E
Semester : 2

Branch Name: MECHANICAL
Subject Name: TH 2A : Engineering Physics
Teacher Name: RADHASHYAM MOHANTA

Credit '2' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Engineering Physics for Diploma by Ranjan Kumar Bhuyan, PHI Private Ltd. New Delhi
2	Text book of physics for XI (part -I, Part-II), N.C.E.R.T
3	Text book of physics for XII (part -I, Part-II), N.C.E.R.T

Reference books:

Sl.No	Reference books
1	Applied Physics-I (English) Author Name-Prof. Vinod Kumar Yadav
2	Optical fibre communications by GERD KEISER, MGH publication .
3	Electronic communication Systems, by George kennedy, Tata McGraw Hill
4	An Introduction to Fiber Optics. By Ajoy K. Ghatak, K. Thyagarajan, Cambridge University Press.

Course Outcomes:

Sl.No	Course Outcomes
1	Estimate errors in measurement of physical quantities.
2	Students will be able to Apply laws of motion in various applications and Calculate effects of gravitational force on planets.
3	Comprehend concept of Heat, Temperature and and their effects on Solids, Acquire knowledge on properties of light.
4	Apply Coulomb's law to calculate electrostatics force, electric field and electric potential.
5	Use basic principles of light, X-rays, Laser and Fibre optics in related engineering problems.

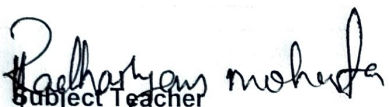| SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
1	1	I	Definition of fundamental and derived units, systems of units (FPS, CGS, MKS and SI units)	Cos 1	
2	2	I	Definition of dimension and Dimensional formulae of physical quantities	Cos 1	
3	3	I	Dimensional equations and	Cos 1	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Principle of homogeneity		
4	4	II	Scalar and Vector quantities	Cos 1	
5	5	II	Resolution of Vectors	Cos 1	
6	6	II	Vector multiplication	Cos 1	
7	7	III	Concept of Rest and Motion, Displacement, Speed, Velocity, Acceleration & Force	Cos 2	
8	8	III	Equations of Motion under GravityCircular motion: Angular displacement, Angular velocity and Angular acceleration	Cos 2	
9	9	III	Circular motion: Angular displacement, Angular velocity and Angular accelerationLinear & Angular velocity	Cos 2	
10	10	III	Relation between Linear & Angular acceleration	Cos 2	
11	11	III	Projectile, Expression for Equation of Trajectory	Cos 2	
12	12	III	Time of Flight, Maximum Height	Cos 2	
13	13	III	Horizontal Range for a projectile fired at an angle, Condition for maximum Horizontal Range	Cos 2	
14	14	IV	Definition, Formula & SI units of WORK AND FORCE	Cos 2	
15	15	IV	Static, dynamic & Limiting Friction	Cos 2	
16	16	IV	Laws of Limiting Friction	Cos 2	
17	17	IV	Coefficient of Friction with problems	Cos 2	
18	18	IV	Useful Methods to reduce friction	Cos 2	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
19	19	V	Newton's Laws of Gravitation	Cos 2	
20	20	V	Universal Gravitational Constant (G), Acceleration due to gravity (g)	Cos 2	
21	21	V	Definition of mass and weight& Relation between g and G.	Cos 2	
22	22	V	Variation of g with altitude and depth	Cos 2	
23	23	V	Kepler's Laws of Planetary Motion	Cos 2	
24	24	VI	Simple Harmonic Motion	Cos 3	
25	25	VI	Expression (Formula/Equation) for displacement, velocity, acceleration of a body/ particle in SHM	Cos 3	
26	26	VI	Wave motion Introduction	Cos 3	
27	27	VI	Amplitude, Wavelength, Frequency, Time Period	Cos 3	
28	28	VI	Derivation of Relation between Velocity, Frequency and Wavelength of a wave	Cos 3	
29	29	VI	Introduction to Ultrasonic	Cos 3	
30	30	VII	Heat and Temperature, Units of Heat,Specific heat	Cos 3	
31.	31	VII	Change of state (concept), Latent Heat (concept, definition, unit, dimension and simple numerical)	Cos 3	
32	32	VII	Thermal Expansion, Expansion of Solids	Cos 3	
33	33	VII	Coefficient of linear, superficial and cubical expansions of Solids.Definition &	Cos 3	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Units.		
34	34	VII	Relation between ?, ? & ?	Cos 3	
35	35	VII	Work and Heat - Concept & Relation	Cos 3	
36	36	VII	Joule's Mechanical Equivalent of Heat (Definition, Unit) ,First Law of Thermodynamics (Statement and concept only)	Cos 3	
37	37	VIII	Reflection & Refraction, Laws of reflection and refraction	Cos 3	
38	38	VIII	Refractive index, Critical Angle and Total internal reflection	Cos 3	
39	39	VIII	Refraction through Prism (Ray Diagram & Formula only)	Cos 3	
40	40	VIII	Fiber Optics :Definition, Properties & Applications.	Cos 3	
41	41	IX	Electrostatics, Statement & Explanation of Coulombs laws, Definition of Unit charge.	Cos 4	
42	42	IX	Absolute & Relative Permittivity (ĀŽÂµ), Electric potential and Electric Potential difference	Cos 4	
43	43	IX	Electric field, Electric field intensity (E) , Capacitance	Cos 4	
44	44	IX	Series and Parallel combination of Capacitors, Magnet, Properties of a magnet.	Cos 4	
45	45	IX	Series and Parallel combination of Capacitors, Magnet,	Cos 4	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Properties of a magnet		
46	46	IX	Magnetic lines of force	Cos 4	
47	47	IX	Magnetic Flux (?) & Magnetic Flux Density (B)	Cos 4	
48	48	X	Electric Current , Ohm's law and its applications	Cos 4	
49	49	X	Series and Parallel combination of resistors	Cos 4	
50	50	X	Kirchhoff's laws (Statement & Explanation with diagram).	Cos 4	
51	51	X	Application of Kirchhoff's laws to Wheatstone bridge	Cos 4	
52	52	X	Balanced condition of Wheatstone's Bridge " Condition of Balance (Equation).	Cos 4	
53	53	XI	Electromagnetism, Force acting on a current carrying conductor placed in a uniform magnetic field	Cos 4	
54	54	XI	Fleming's Left Hand Rule, Fleming's Right Hand Rule	Cos 4	
55	55	XI	Faraday's Laws of Electromagnetic Induction, Lenz's law	Cos 4	
56	56	XI	Comparison between Fleming's Right Hand Rule and Fleming's Left Hand Rule.	Cos 5	
57	57	XII	LASER & laser beam	Cos 5	
58	58	XII	Principle of LASER (Population Inversion & Optical Pumping)	Cos 5	
59	59	XII	Properties & Applications of LASER	Cos 5	
60	60	XII	Wireless	Cos 5	

SL No.	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference Material Links
			Transmission – Ground Waves, Sky Waves, Space Waves (Concept & Definition)		

Subject Teacher   HOD   Principal

CAPITAL ENGINEERING COLLEGE

AICTE

PLOT NO. 1293, MAHATAPALLA, BAJAPUR,KHURDA
Session: 2023-2024

Course Name: DIPLOMA
Branch Name: MECHANICAL

Subject Name: TH 3 : Engineering Mathematics-II
Theory/Practical: Theory

Section: E
Teacher Name: GYANA RANJAN RATH

Semester: 2

Credit '3' External Evaluation(Marked) '80' Internal Evaluation(Marked) '20'

Text Books:

Sl.No	Text Books
1	Elements of Mathematics _ Vol. _ 1 & 2 (Odisha State Bureau of Text Book preparation & Production

Reference books:

Sl.No	Reference books
1	Mathematics Part- I & Part- II- Textbook for Class XII, NCERT Publication

Course Outcomes:

Sl.No	Course Outcomes
1	Students will be able to know the meaning of vectors, and use them when adding and subtracting.. They will be able to learn how
2	Calculate the limit of a function of two variables. Learn how a function of two variables can approach different values at a bou
3	An openended task that is given to all children. The children then attempt this task in their own way and at their own pace, thu
4	Integration is a mathematical technique to calculate the area under a curve. There are multiple methods for integration, of whic
5	understand that physical systems can be described by differential equations. understand the practical importance of solving diff

SL	Lecture No.	Module/Unit No.	Topic To Be Taught	Cos	Reference
1	1	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
2	2	1	(VECTORS) definition , representation ,Types of vectors	Cos 1	
3	3	1	Component form of scalar product , Angle between two vectors	Cos 1	

			Scalar and vector projection of a vector on another vector	Cos 1	
4	4	1	Scalar and vector projection of a vector on another vector	Cos 1	
5	5	1	Vector or Cross product of vectors , properties of cross product Right hand screw rule	Cos 1	
6	6	1	Component form of vector product, Geometrical meaning of cross p	Cos 1	
7	7	1	Area of a triangle and parallelogram	Cos	
8	8	2	(FUNCTION) Cartesian product of sets and relation on a set and from one set to another, Relation and	Cos 2	
9	9	2	Types of function- constant fun. , absolute value function , signum Function , etc.	Cos 2	
10	10	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
11	11	2	Greatest integer function and Graphs, logarithmic and exponential Functions etc.	Cos 2	
12	12	2	(LIMIT) limit of a function , working rule to find limit , examples	Cos 2	
13	13	2	Limit formulas for indeterminate forms 0/0 , âˆž-âˆž, âˆž/âˆž etc	Cos 2	
14	14	2	Limit formulas for indeterminate forms 0/0 , âˆž/âˆž etc	Cos 2	
15	15	2	Limit formulas for indeterminate forms 0/0 , âˆž-âˆž, âˆž/âˆž etc	Cos 2	
16	16	2	Existence of limits (LHL and RHL)	Cos	
17	17	2	(CONTINUITY OF A FUNCTION) continuity at a point ,	Cos 2	
18	18	2	Examples of pont of discontinuity , (|x| , [x] etc.)	Cos 2	
19	19	2	Problems on continuity and discontinuity	Cos 2	
20	20	2	(DERIVATIVE) definition , derivative at a point , examples	Cos 2	
21	21	3	Algebra of derivative , Addition , Subtraction , quotient , product rule etc.	Cos 3	
22	22	3	Derivative of ex , log x , xn , a x etc.	Cos	
23	23	3	Derivative of sin x , cos x ,,,,,, , sin â€“ 1 x , cos â€“ 1x , etc	Cos 3	
24	24	3	Derivative of composite function (Chain Rule) , examplesvvv	Cos 3	
25	25	3	More examples on Chain rule	Cos	

26	26	3	Methods or Technique s of derivative- parametric form , derivative of Implicit function	Cos 3	
27	27	3	Derivative using log	Cos	
28	28	3	Derivative of inverse Trigonometric function	Cos 3	
29	29	3	Derivative of a function w.r.t another function	Cos 3	
30	30	3	(APPLICATION OF DERIVATIVE) Successive differentiation, Higher dervatve related problems	Cos 3	
31	31	3	Partial differential equation of f(x , y) , f(x , y , z)etc.	Cos 3	
32	32	3	Eulerâ€™s theorem , L â€˜ Hospital Rule	Cos 3	
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34	34	4	(INTEGRATION) Integration as anti-process of derivative - I (integration of sin x , cos x , 1/x , xn , e x etc.)	Cos 4	
35	35	4	Standard integration formulas , Properties of Indefinite integration	Cos 4	
36	36	4	Integration by substitution â€“ (integration of tan x ,cot x sec x ,cosec x Etc. âˆ« Fâ€™ / F dx)	Cos 4	
37	37	4	Integration by algebraic substitution and examples	Cos 4	
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39	39	4	Integration by partial fraction	Cos	
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43	43	4	(DEFINITE INTEGRATION) Properties I , II , II	Cos 4	
44	44	4	Properties of Definite Integration â€“ IV , V , VI and applications	Cos 4	
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50	50	5	(DIFFERENTIAL EQUATION) definition , order and degree	Cos 5	
51	51	5	Solution of differential equation , General and Particular sol.	Cos 5	
52	52	5	Differential equation of 1st order and 1st degree , Variable separation method,	Cos 5	
53	53	5	Homogeneous form and solution	Cos	
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56	56	5	Sample previous year questions and solutions	Cos 1	
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Subject Teacher   **HOD**   **Principal**