

Programme : Diploma in CE/EE/ET/ME/MT/CM/IT/DDGM

Programme Code : 01/02/03/04/05/06/07/08/21/22/23/24/26

Name of Course : English

Course Code : HU181

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	02 Hrs.	–	–	–
Marks	20	80	–	–	25

Course Rationale:

This is been noticed that diploma pass outs lack in grammatically correct written and oral communication in English. It is also been noticed that communication is not a problem of students, communication in correct English is the basic problem of Diploma pass outs. Students will have to interact in this language so far as their career in industry is concerned. In order to enhance this ability in students English is introduced as a subject to groom their personality.

Course Outcomes:

Students should be able to

1. Apply grammatical rules to form correct sentences.
2. Answer the questions based on the articles
3. State the meanings of the given words from the articles.
4. Write a paragraph on a given topic.
5. Comprehend provide the answers on given passages.
6. Use correct words as per situations

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1 : GRAMMER		
To apply Grammar for day today and routine Reading, writing, Speaking and Listening Practices.	1.1 Tenses : Past Perfect, Past Perfect Continuous 1.2 Types of Sentences: Simple, Compound and Complex. 1.3 Verbs 1.4 Reported Speech : Complex Sentences 1.5 Uses of 'too' and 'enough' : Conversion and Synthesis. 1.6 Modal Auxiliary : Will, shall, can, could 1.7 Articles 1.8 Preposition 1.9 Conjunctions Interjections 1.9 Affirmative and negative, interrogative 1.10 Question tag	12
Unit 2: PARAGRAPH WRITING		
1.To practice Writing Paragraphs	2.1 Types of paragraphs (Narrative, Descriptive, Technical)	04
Unit 3: N COMPREHENSION		
1.To practice Comprehensions	3.1 Unseen passages	10
Unit 4: VOCABULARY		
1.To Improve Vocabulary And learn Various Jargon related Vocabulary.	4.1 Homophones: To understand the difference between meaning and spelling of words 4.2 Vocabulary : Understanding meaning of new words	10
Total Hrs		32

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1	Building of Vocabulary – 2 assignments 25 new words for each assignment with sentence	Vocabulary	04
2	Conversational Skills – Role play student will perform the role on any 6 situations. Dialogue writing for the given situations.	Grammar	04
3	Grammar – 2 assignments	Grammar	04
4	Write paragraphs on given topics. 2 assignments	Paragraph	04
5	Errors in English 2 assignments. Find out the errors and rewrite the sentences given by the teacher.	Comprehension	04
6	Essay writing 2 assignments. Write 2 essays on topic given by the teacher.	Comprehension	04
7	Biography (Write a short biography on your role model approximately in 250-300 words)	Vocabulary	04
8	Idioms and phrases Use of idioms and phrases in sentences(20 examples)	Comprehension	04
Total Hrs			32

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Grammar	Classroom teaching and demo sessions
2	Paragraph writing	Classroom teaching and demo
3	Comprehension	Classroom teaching and demo sessions
4	Vocabulary	Classroom teaching

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Grammar	–	10	10	20
2	Paragraph writing	–	05	05	10
3	Comprehension	–	30	10	40
4	Vocabulary	02	04	04	10
Total		02	49	29	80

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT and (avg. of Two tests will be computed)	20	–	Test Answer sheets	1,2,3,4
				TOTAL	20	=		1,2,3,4
	(Term End Examination)	End Exam		End Of the Course	80	28	Theory Answer sheets	1,2,3,4
Direct Assessment Practical	Continuous Assessment	ST	Students	—	–	–	–	
					Journal Writing	End of the course	15	–
	(Term End Examination)	End Exam		End Of the Course	50	20	Practical Answer Sheets	1,2,3,4
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3,4
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Presentations	10
2	Oral skills	10
3	Content	05
	TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	03	03	03	03	03	01	02	01	01	03
2	03	01	03		03	01	02	01	01	03
3	03	02	02	02	01	01	02	01	01	03
4	03	01	02	02	01	01	02	01	01	03
5	03	01	02	02	01	01	02	01	01	03
6	03	01	02	02	01	01	02	01	01	03

Text Book

Sr. No	Author	Title	Publication
1	J.D.O. Connors	Better English Pronunciation	London Cambridge University Press ELBS
2	Geofrey Leech	A communicative Grammar of English	Essex Longman Group Ltd. : ELBS
3	Randolf Quirk	University Grammar of English	Essex Longman Group Ltd. : ELBS

Programme : Diploma in CE/EE/ET/ME/MT/CM/IT/DDGM

Programme Code : 01/02/03/04/05/06/07/08/21/22/23/24/26

Name of Course : Communication skill

Course Code : HU182

Teaching Scheme:

	Hours /Week	Total Hours
Theory	02	32
Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	02 Hrs.	–	–	–
Marks	20	80	–	–	25

Course Rationale:

Classified under human sciences this subject is intended to introduce students with the process of communication so that they can identify conditions favorable to effective communication. They will also be taught basic and applied language skills viz. listening, speaking, reading and writing – all useful for the study of a technical course and communication. Specifically, writing and oral presentation skills are two top ranking capabilities needed for professional careers and must be developed systematically.

Course Outcomes:

Students should be able to

1. Analyze communication event.
2. Use the patterns required to communicate in an organization.
3. Communicate using appropriate non-verbal codes.
4. Draft various types of letters and office drafts.

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1 : Basic concepts and principles of communication		
1. Define all elements of communication. 2 Analyze communication event. 3. Define the stages of communication process. 4. Apply the principles of communication and minimize the barriers.	1.1 The communication Event The communication event: Definition The elements of communication: The sender, receiver, message, channel, feedback. 1.2 The communication Process The communication process: Definition Stages in the process: defining the context, knowing the audience, designing the message, encoding, selecting the proper channels, transmitting, receiving, decoding and giving feedback. 1.3 Principles of Effective communication Effective Communication: definition Communication Barriers and how to overcome them at each stage of communication process.	12
Unit 2: Organizational Communication		
1. Understand non-verbal codes and use them effectively	1.1 What is an organization Goal. Patterns of communication: Upward, Downward, Horizontal and Grapevine	04
Unit 3: Non-verbal Communication		
Understand non-verbal codes and use them effectively	3.1 Non-verbal codes: Kinesics (eye-contact, gesture, postures, body movements and facial expressions) Proxemics (using space), Haptics (touch), Vocalics (Aspect of Speech like tone, emphasis, volume, pauses etc.) Physical Appearance, Chronemics (manipulating time), Silence	06
Unit 4: Business Correspondence and Office Drafting		
Understand office drafts and letters and practice those in various contexts.	4.1 Business Correspondence: Letter of Enquiry, Order letter, Complaint Letter 4.2 Office Drafting: Circular, Notice and Memo 4.3 Job Application with Resume	10
Total Hrs		32

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1	Introduce themselves with self informative parameters	Self introduction	02
2	Present orally a speech on a topic using body language and vocalic	Elocution	04
3	Practice to speak on given unknown topic instantly	Extempore	04
4	Rehearse a role play of an interview	Mock Interview	04
5	Participate in a debate activity	Debate	02
6	Understand, practice various applications and reports	Variety Application/Reports	02
7	Write paragraphs on technical subjects	Writing Paragraphs on Technical Subjects	02
8	Draft business letters	Business letter	02
9	Practice and present one of the syllabus topics	Individual/ Group Presentation on identified topics	02
10	Discuss on a current topic sitting in a group	Group discussion n	02
11	Rehearse various role plays of various oral presentation	Role play	06
		Total Hrs	32

Instructional Strategy:

Sr.No	Topic	Instructional Strategy
1	Basic concepts and principles of Communication	Classroom teaching and demo sessions
2	Organizational communication	Classroom teaching and demo
3	Non-verbal communication	Classroom teaching and demo sessions
4	Business Correspondence and Office Drafting	Classroom teaching

Specification Table for Theory Paper:

Sr. No.	Topic	Cognitive Levels			Total
		Knowledge	Comprehension	Application	
1	Basic concepts and principles of communication	–	10	14	24
2	Organizational communication	08	04	08	20
3	Non-verbal communication	02	00	10	12
4	Business correspondence and office drafting	04	10	10	24
Total		14	24	42	80

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	ST	Students	Two PT (average of two tests)	20	–	Test Answer sheets	1,2,3,4
				TOTAL	20	=		1,2,3,4
	(Term End Examination)	End Exam		End Of the Course	80	28	Theory Answer sheets	1,2,3,4
Direct Assessment Practical	Continuous Assessment	ST	Students	—	–	–	–	
		Journal Writing		End of the course	15	–	Journal	1,2,3,4
	(Term End Examination)	End Exam		End Of the Course	50	20	Practical Answer Sheets	1,2,3,4
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3,4
	End exam			End Of The Course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Presentations	10
2	Oral skills	10
3	Content	05
	TOTAL	25

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	–	03	02		03		03	03	03	03
2		02	03		03		03	03	03	03
3		02	03		03		03	03	03	03
4		02	03		03		03	03	03	03

Text Book

Sr. No	Author	Title	Publication
1	MSBTE	Communication skills	London Cambridge University Press ELBS
2	Joyeeta Bhattacharya	Communication skills	Essex Longman Group Ltd. : ELBS
3	Krishna Mohan and Meera Banerji	Developing communication skills	Essex Longman Group Ltd. : ELBS
4	Sarah Freeman	Written communication in English	Essex Longman Group Ltd. : ELBS

Programme : CE/EE/ET/ME/MT/CM/IT Engineering

Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26

Name of Course : APPLIED MATHEMATICS I

Course Code : SC181

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	01	16

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	02 Hrs.	–	–	–
Marks	20	80	–	–	–

Course Rationale:

The students of Diploma in Engineering and technology must acquire some essential Competencies in Mathematics.

Course Outcomes:

After completing this course students will be able to

1. Think logically and systematically.
2. Learn the importance of accuracy and develop attitude of problem solving with diligence and perseverance.
3. Use the basic principles of algebra to solve the engineering problems.
4. Use the basic principles of trigonometric in various engineering practices.
5. Apply coordinate geometry principles in the design and practices in engineering tools.

Course Contents: (Course Name: Applied Mathematics I - SC181)

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1 : Algebra		
1.Solve the examples using laws of logarithm. 2. Solve simultaneous equations in three variables using Cramer’s rule. 3. Perform all algebraic operations on matrices. 4. Solve simultaneous equations in three variables using adjoint matrix method. 5. Find partial fraction of proper and improper fraction. 6. Define binomial expansion general term 7. Solve examples using binomial theorem.	1.1 Logarithm: Definition, Laws of Logarithms, Simple examples based on laws 1.2. Determinant : Determinants of second and third orders, solution of simultaneous equations in two and three unknowns (Cramer’s Rule), Properties of determinants of order 3 and examples. Characteristics of computer, 1.3 Partial fraction: Rational fractions, resolving given rational fraction into partial fraction (Type : Denominator containing non-repeated, repeated linear factors and non-repeated quadratic factor)	18
Unit 2: Trigonometry		
1. Define basic trigonometric terms. 2. Determine values of trigonometric ratios of standard angles. 3. Solve examples of allied angle, compound angle, multiple and sub-multiple angles. 4.Solve examples using factorization and de-factorization formulae 5. Solve examples of inverse trigonometric ratios.	2.1 Trigonometric ratios and fundamental identities 2.2 Trigonometric ratios of allied angles, compound angles, multiple angles (2A, 3A), sub-multiples angle. 2.3 Sum and product formulae. 2.4 Inverse Circular functions. (definition and simple problems)	20
Unit 3: Co ordinate geometry		
1.1.Define slope, various forms of equation of straight line. 2.Find slope and intercepts of straight line. 3.Find Angle between two straight lines. 4.Define condition of Parallel and Perpendicular lines. 5. Define various forms of equation of circle. 6. Solve problems with given condition.	3.1 Straight Line: Slope and intercept of straight line. Equation of straight line in slope point form, slope-intercept form, two-point form, two-intercept form, normal form. General equation of line. Angle between two straight lines. Condition of Parallel and Perpendicular lines. Intersection of two lines. Length of perpendicular from a point on the line and perpendicular distance between parallel lines. 3.2 Circle: Equation of circle in standard form, Centre-radius form, Diameter form, two intercept form. General equation of a circle and its centre radius.	10
Total Hrs		48

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Hrs.
1	Examples on laws of logarithm.	01
2	Examples on expansion of order 2 and 3 determinant and solution of simultaneous equation by Cramer's rule	01
3	Examples on Proper and Improper partial fraction.	01
4	Examples on algebra of matrices.	01
5	Examples on Adjoint, Inverse of matrix and solution of simultaneous equations by adjoint method.	01
6	Examples on Binomial expansion and general term in expansion.	02
7	Examples on Trigonometric ratios and fundamental identities.	02
8	Examples on allied angles, compound angles, multiple angles (2A, 3A), sub-multiples angle.	04
9	Examples on Sum and product formulae.	01
10	Examples on Inverse trigonometric function	01
11	Examples on straight line.	01
12	Examples on Circle.	01
	Skill Test	02
	Total Hrs	14

Instructional Strategy:

Sr No	Topic	Instructional Strategy
1	Algebra	Class room teaching , chalk board
2	Trigonometry	Class room teaching , chalk board
3	Co-ordinate Geometry	Class room teaching , chalk board

Specification Table for Theory Paper:

Sr. No.	Topic	Levels from Cognition process dimension			Total
		R	U	A	
1	Algebra	08(04)	16(08)	08(04)	32(16)
2	Trigonometry	08(04)	16(08)	08(04)	32(16)
3	Co-ordinate geometry	04(02)	08(04)	04(02)	16(08)
	Total	20(10)	40(20)	20(10)	80(40)

Assessment and Evaluation Scheme:

Direct Assessment (Theory)	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
	Direct Assessment (Theory)	CA (Continuous Assessment)	PT	STUDENTS	Two PT (average of two tests will be computed)	20	–	Test answer sheets
Class room Assignment			Assignments		–	–	Assignment Book	1,2,3,4,5
TOTAL		20	–		–	–	–	
TEE (Term End Exam)		End exam	End of the course		80	28	Theory Answer Sheets	1,2,3,4,5
Direct Assessment (Practical)	–	–	–	–	–	–	–	
Indirect Assessment	Student Feedback on course		STUDENTS	After first PT	Student feedback form			
	End of Course			End of the course	Questionnaires			

Scheme Of Practical Evaluation:

S.N.	Description	Max. Marks
1	Observations	N.A.
2	Calculations and Result	N.A.
3	Viva voice	N.A.
	TOTAL	

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	3	3	2	1	2	1	2	3	2	2
2	3	3	2	1	2	1	2	3	2	2
3	3	2	2	1	1	1	2	2	1	2
4	3	3	3	2	1	1	2	2	1	1
5	3	2	3	2	1	1	2	2	1	1
6	3	2	3	2	1	1	2	2	1	1

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Title	Author, Publisher, Edition and Year of publication	ISBN Number
1	Mathematics for Poly-technic Students	Pune Vidyarthi Griha , Shri S.P. Deshpande	—
2	Plane Trigonometry	Macmillan and London , Shri S.L. Loney	
3	Mathematics for Engineers(Vol.I)	S.Chand and Comp. , Shri H.K. Dass	
4	Engg. Maths Vol.I and II	S. Chand and Comp. Shri hantinarayan	

Programme : CE/EE/ET/ME/MT/CM/IT Engineering

Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26

Name of Course : APPLIED MAHEMATICS II

Course Code : SC182

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	01	16

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	02 Hrs.	–	–	–
Marks	20	80	–	–	–

Course Rationale:

This subject intends to teach students basic facts, concepts, principles and procedure of Mathematics as a tool to analyze Engineering problems and as such it lays down foundation for the understanding of engineering science and core technology subjects.

Course Outcomes:

After completing this course students will be able to

1. Understand basic facts of Mathematics about the field of analysis of any Engineering problem.
2. Know the standard ways in which the problem can be approached.
3. Apply basic concepts to engineering problems.

Course Contents: (Course Name: Applied Mathematics II - SC182)

A. Theory

Specific Learning Outcomes (Cognitive,Domain) Marks	Topics and subtopics	Hrs.
Units 1 : FUNCTIONS AND LIMITS		
1. Identify the function and find the value of function. 2. Evaluate limits of different types of functions.	1.1 Functions: Concept of functions, Types of functions (only definitions) 1.2. Limits: Concept of limits and limits of function (algebraic, trigonometric, logarithmic and exponential).	13
Unit 2: DERIVATIVES		
1. Find the derivatives by first principle. 2. Solve problems using rules and methods of derivatives. 3. apply derivative in engineering tools.	2.1 Definition of the derivative, derivatives of standard Functions. 2.2 Differentiation of sum, difference, product and quotient of two or more functions. 2.3 Differentiation of composite, inverse, implicit functions. 2.4 Differentiation of parametric, exponential and logarithms functions. 2.5 Successive differentiation.	16
Unit 3: APPLICATIONS OF DERIVATIVES		
1. Find the derivatives by first principle. 2. Solve problems using rules and methods of derivatives. 3. apply derivative in engineering tools.	3.1 Geometrical meaning of derivative (Equations of tangents and Normals) 3.2 Maxima and minima of functions.	05
Unit 4: VECTORS		
1. Define different types of vectors 2. Find dot and cross product of vectors 3. Find work done and moment of force about the point and line	4.1 Definition of vector, position vector, Algebra of vectors (Equality, addition, subtraction and scalar multiplication). 4.2 Dot (Scalar) product with properties. 4.3 Vector (Cross) product with properties. 4.4 Work done and moment of force about a point & line.	06
Unit 5: NUMERICAL METHODS		
1. Find the approximate root of algebraic equation 2. Solve the system of equations in three unknowns	5.1 Solution of algebraic equations: Bisection method, Regular falsi method and Newton–Raphson method. 5.2 Solution of simultaneous equations containing 2 and 3 Unknowns: Gauss elimination method. Iterative methods Gauss Seidal and Jacobi's method.	08
Total Hrs		48

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Hrs.
1	Examples on function.	01
2	Examples on algebraic limits	01
3	Examples on trigonometric limits.	01
4	Examples on exponential and logarithmic limits.	01
5	Examples on differentiation of sum, difference, product and quotient of two or more functions and composite function.	01
6	Examples on differentiation of exponential , logarithms , inverse, implicit functions.	02
7	Examples on differentiation of parametric function and Successive differentiation.	02
8	Examples on equation of tangent & normal & determination of maxima & minima of fuction.	04
9	Examples on properties f dot and cross product of vectors.	01
10	Examples on Work done and moment of force about a point line.	01
11	Solution of algebraic equations : Bisection method, Regulafalsi method and Newton –Raphson method.	01
12	Solution of simultaneous equations containing 2 and 3Unknowns :Gauss elimination method. Iterative methods- Gauss Seidal and Jacobi’s method.	01
13	Skill Test	02
	Total Hrs	14

Instructional Strategy:

Sr No	Topic	Instructional Strategy
1	Function and Limit	Class room teaching, chalk board
2	Derivatives	Class room teaching, chalk board
3	Application of derivatives	Class room teaching, chalk board
4	Vector	Class room teaching, chalk board
5	Numerical methods	Class room teaching, chalk board

Specification Table for Theory Paper:

Sr. No.	Topic	Levels from Cognition process dimension			Total
		R	U	A	
1	Function and Limit	04(04)	08(04)	06(02)	18(10)
2	Derivatives	08(04)	16(08)	00(00)	24(12)
3	Application of Derivatives	00(00)	00(00)	08(04)	08(04)
4	Vector	04(02)	04(00)	06(04)	14(06)
5	Numerical methods	04(02)	04(02)	08(04)	16(08)
	Total	20(12)	32(14)	28(14)	80(40)

Assessment and Evaluation Scheme:

Direct Assessment (Theory)	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
		CA (Continuous Assessment)	PT	STUDENTS	Two PT (average of two tests will be computed)	20	–	Test answer sheets
Class room Assignment			Assignments		–	–	Assignment Book	1,2,3
			TOTAL		20	–	–	–
TEE (Term End Exam)		End exam	End of the course		80	28	Theory Answer Sheets	1,2,3
Direct Assessment (Practical)	–	–	–	–	–	–	–	
Indirect Assessment	Student Feedback on course		STUDENTS	After first PT	Student feedback form			
	End of Course			End of the course	Questionnaires			

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	3	3	2	1	2	1	2	3	2	2
2	3	3	2	2	1	1	2	3	2	1
3	3	3	3	2	1	1	2	2	1	2

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr. No	Title	Author, Publisher, Edition and Year of publication
1	Engineering Mathematics Vol.I	Vishwanath, Satya Prakashan, New Delhi
2	Mathematic for polytechnic students I & II	S.P. Deshpande, Pune Vidyarthi Griha Prakashan
3	Mathematics for Engineering Vol-I	H.K. Dass, S.Chand and Company
4	Engineering Mathematics vol-I and II	Shantinarayan, S.Chand and Company

Programme : CE/EE/ET/ME/MT/CM/IT Engineering

Programme Code : 01/02/03/04/05/06/07/21/22/23/24/26

Name of Course : ENGINEERING PHYSICS

Course Code : SC183

Teaching Scheme:

	Hours /Week	Total Hours
Theory	03	48
Practical	02	32

Evaluation:

	Progressive Assessment	Semester End Examination			
		Theory	Practical	Oral	Term work
Duration	Two class tests each of 60 minutes.	03 Hrs.	02 Hrs.	–	–
Marks	20	80	50	–	–

Course Rationale:

The study of Engineering Physics emphasizes the application of basic scientific Principles to the design of equipments which includes electronic and electromechanical systems for use in measurement, communications and data acquisition.

The course covers the basic laws of nature and gives brief idea about principles of physics and their applications to meet the challenges posed by fast changing technology.

Course Outcomes:

After completing this course students will be able to:

1. Develop logical and analytical abilities.
2. Illustrate basic concepts in physics
3. Interpret various laws in physics using different basic instruments.
4. Apply principles and laws of physics.
5. To identify and solve numerical.
6. Recognize role of principles of physics in Engineering and technology

Course Contents:

A. Theory

Specific Learning Outcomes (Cognitive,Domain)	Topics and subtopics	Hrs.
Units 1: Motion		
1. Define circular motion and UCM 2. Define Simple harmonic motion with example. 3.State characteristics of SHM 4.Explain centripetal and centrifugal force with its example and application 5. Explain SHM as a projection of UCM on any one diameter of circle. 6. Distinguish between centripetal and centrifugal force. 7. Derive equation of SHM when particle starts motion from mean position.	1.1 Introduction 1.2. Circular Motion: UCM, angular displacement,angular velocity, angular acceleration, radial velocity, tangential velocity, periodic time, frequency, relation between linear and angular velocity, explanation of centripetal and centrifugal force, with application, relation between velocity frequency and wavelength. 1.3 SHM: Definition, SHM as a projection of UCM on the diameter, Equation of SHM, displacement and graphical representation.	06
Unit 2: Properties of matter		
1: Define Surface tension of liquid with its unit. 2 State significance of angle of contact. 3. State the effect of temperature and impurity on surface tension of liquid. 4.Explain phenomenon of ST with the help of Laplace's molecular theory. 5. State Newton's law of viscosity. 6. Distinguish between stream line and turbulent flow. 7. State Significance of Reynolds number. 8. Explain behavior of wire under continuous increase in load. 9. State Hooks law and define elastic limit. 10. Define different Moduli with its unit.	2.1 Surface Tension: Molecular theory of surface tension, Cohesive and adhesive forces, Angle of contact, shape of liquid surface in capillary tube, capillary action (Examples). Surface tension by capillary rise method, (no derivation), simple problem, effect of impurity and temperature on surface tension. 2.2 Viscosity: Definition, velocity gradient, Newton's Stokes' law of viscosity, terminal velocity, coefficient of viscosity by stokes method(No derivation), type of flow of liquid - stream line flow,turbulent flow, Reynolds's number (significance), applications and simple problems 2.3 Elasticity: Elastic, plastic and rigid bodies, stress and strain, Hook's law, types of elastic moduli with its relation, problems. Behaviour of wire under continuously increasing load.	08

Unit 3: Sound		
<p>1. Distinguish between Transverse wave and Longitudinal wave.</p> <p>2. Define Resonance with its applications.</p> <p>3. Define . . .</p> <p>(1) Coefficient of absorption.</p> <p>(2) Coefficient of transmission.</p> <p>(3) Coefficient of reflection.</p> <p>3. State characteristics of Free vibrations and forced vibration.</p>	<p>3.1. Wave motion, Transverse and longitudinal waves, free and forced vibrations, Resonance-explanation and example. absorption, reflection and transmission of sound.</p>	03
Unit 4: Heat		
<p>1. State Boyle's law and Charles's law and Gay Lussac's law.</p> <p>2. State the factors affecting conduction of heat and give relation between them.</p> <p>3. Define coefficient of thermal conductivity of a material with its unit.</p> <p>4. Explain absolute zero scale of the temperature.</p>	<p>4.1 Explanation of Gas laws, Boyle's law, Charles's law, Gay Lussac's law, General Gas Equation, problems on gas laws, units of temperature 0C, 0K with their conversion, absolute scale of temperature, modes of heat transfer, conduction, convection and radiation.</p>	04
Unit 5: Optics		
<p>1. State Snell's law of reflection.</p> <p>2. Define reflection and refraction.</p> <p>3. Define refractive index and state its physical significance.</p> <p>4. Define Numerical aperture and Acceptance cone.</p> <p>5. Explain different types of optical fiber.</p> <p>6. Distinguish between electrical cable and optical fiber communication.</p> <p>7. Explain the phenomenon of Total internal reflection with diagram.</p> <p>8. State properties of LASER.</p> <p>9. Explain construction and working of He-Ne LASER.</p> <p>10. Define population inversion With diagram.</p>	<p>5.1 Introduction to reflection and refraction of light, Snell's law, physical significance of refractive index, critical angle, total internal refraction of light.</p> <p>5.2 Fiber optics : Propagation of light through optical fiber, numerical aperture, types of optical fibers, applications and comparison with electrical cable.</p> <p>5.3 LASER: Definition, spontaneous and stimulated emission, population inversion, He-Ne laser- construction and working, applications and properties of LASER.</p>	08

Unit 6: Electrostatics		
1. State Coulomb's law of charges. 2. Define Electric field and Intensity of electric field. 3. State any four properties of electric lines of forces. 4. Define charge of one coulomb. 5. Explain why potential of earth is Zero. 6. Define potential difference and absolute potential.	6.1 Electric charge, Coulomb's law in Electrostatics, unit of charge, electric field, intensity of electric field, electric lines of forces (Properties), electric flux, flux density. 6.2 Electric potential: Explanation, definition, potential due to a point charge, potential due to a charged sphere, absolute electric potential, simple problems.	06
Unit 7: Current Electricity		
1.State and explain Ohm's law. 2.Define Resistance and Specific resistance. 3.Explain Wheatstone's network with its principle. 4.With neat diagram explain construction and principle of potentiometer. 5.Define EMF and potential gradient with its unit. 6. Define electric energy and power.	7.1 Current, resistance, specific resistance, Whetstone's network, meter bridge, balancing condition of meter bridge, measurement of unknown resistance using meter bridge, problems 7.2 Principle of potentiometer, potential gradient, E.M.F., comparison of E.M.F. using potentiometer. 7.3 Electric work, electric power, energy, units and calculations of electric bill.	06
Unit 8: Electromagnetism		
1.State and explain Biot's savart law. 2.State Fleming's left-hand rule. 3.Give Ampere's Right-hand rule 4.Obtain an expression for force experienced by current carrying straight conductor placed in magnetic field.	8.1 Magnetic effect of electric current, Ampere's rule, intensity of magnetic field, magnetic induction, Biot-Savert's Law (Laplace's Law), Fleming's left hand rule, force experienced by current carrying straight conductor placed in magnetic field, problems.	03
Unit 9: Modern Physics		
1.State properties of X-Ray. 2.Explain production of X-Ray with neat label diagram. 3.State application of X-Ray. 4.Explain photoelectric effect. 5.Define Threshold frequency and Stopping potential. 6.State application of photoelectric cell. 7.State Einstein's photoelectric equation. 8.With neat diagram explain working of photoelectric cell.	9.1 X- ray's, principle, production, properties and applications 9:2 Photo electricity: Plank's quantum theory, photoelectric effect (circuit diagram and working), threshold frequency, stopping potential, work function, Einstein's photoelectric equation, photocell, problems	06

B. List of Practicals/Laboratory Experiences/Assignments:

Practical No.	Specific Learning Outcomes (Psychomotor Domain)	Units	Hrs.
1	Use of vernier calliper to measure the dimensions of different objects.	Motion	02
2	To understand the concept of error in instrument and to measure the dimensions of different objects using micrometer screw gauge	Motion	02
3	To determine period of simple pendulum.	Motion	02
4	To determine the velocity of sound using resonance tube method.	Sound	02
5	To determine Surface Tension by Capillary rise method.	Properties of matter	04
6	To determine Specific resistance using Ohm's law.	Current electricity	04
7	To understand the concept of Wheatstone network and to determine specific resistance using Meter bridge.	Current electricity	04
8	To compare EMF of cell using Single cell method.	Current electricity	02
9	To determine coefficient of viscosity using Stokes law.	Properties of matter	02
10	Study of concept of total internal reflection.	Light	02
11	Study of characteristics of photocell.	Modern Physics	02
12	To determine permittivity of free space.	Electromagnetism	02
	Skill Test		02
		Total Hrs	32

Instructional Strategy:

Sr No	Topic	Instructional Strategy
1	Motion	Classroom teaching and Demonstration method
2	Properties of matter	Audio video, Classroom teaching
3	Sound	Role-Play, Classroom and visual teaching
4	Heat	Demonstration and classroom teaching
5	Optics	Demonstration and classroom teaching
6	Electrostatics	Classroom teaching
7	Current Electricity	Classroom teaching, laboratory method
8	Electromagnetism	Classroom teaching
9	Modern Physics	Brain Storming

Specification Table for Theory Paper:

Sr. No.	Topic	Levels from Cognition process dimension			Total
		R	U	A	
1	Motion	02(04)	03(02)	01(02)	06(08)
2	Properties of matter	04(05)	02(03)	02(04)	08(12)
3	Sound	01(02)	01(02)	01(02)	03(06)
4	Heat	02(02)	01(02)	01(02)	04(06)
5	Optics	03(06)	02(03)	01(03)	06(12)
6	Electrostatics	02(04)	02(04)	02(02)	06(10)
7	Current Electricity	03(04)	01(03)	02(03)	06(10)
8	Electromagnetism	01(03)	01(02)	01(01)	03(06)
9	Modern Physics	03(05)	02(03)	01(02)	06(10)
	Total	21(35)	15(24)	12(21)	48(80)

Assessment and Evaluation Scheme:

	What		To Whom	Frequency	Max Marks	Min Marks	Evidence Collected	Course Outcomes
Direct Assessment Theory	Continuous Assessment	PT	Students	Two PT (average of two tests)	20	–	Test Answer sheets	1,2,3
				TOTAL	20	=		
	(Class room Assignment)	End Exam		Assignments	–	–	Assignment book	4,5,6
Direct Assessment Practical		Journal Writing	Students	Assignments	15	–	Journal	4,5,6
				TOTAL	25	10		
	(Term End Examination)	End Exam		End Of the Course	50	20	Practical Answer Sheets	4,5,6
Indirect Assessment	Student Feedback on course		Students	After First PT	Student Feedback Form			1,2,3 4,5,6
	Course Feedback			End Of The Course	Student Feedback Form			

Mapping Course Outcomes With Program Outcomes:

Course Outcomes	Program Outcomes (POs)									
	1	2	3	4	5	6	7	8	9	10
1	3	1	2	1	1	2	3	2	2	2
2	3	2	1	1	1	2	2	2	2	3
3	1	2	3	2	2	1	–	1	1	1
4	2	1	3	3	3	–	1	2	1	1
5	3	2	2	2	1	1	1	2	1	2
6	3	1	2	1	1	1	3	1	1	3

1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)

Reference & Text Books:

Text Book

Sr.No	Title	Author, Publisher, Edition and Year of publication
1	R.K. Gaur and S. L. Gupta	Engineering Physics,Dhanpat Rai and Sons Publications
2	Basic Applied Physics	Manikpure, Prakash Deshpande and Dagwar, S.Chand and Co.New Delhi
3	Text book in Physics for diploma Engg. Student	Sony Publications Pvt. Ltd.
4	Applid Physics	Schum's Series
5	Engineering Physics	Kshirsagar, Avdhanalu
4	Basic Physics(E-Scheme)	M.S.Pawar, M.A.Sutar

E-References:

1. www.howstuffworks.com
2. https://en.wikipedia.org/wiki/Engineering_physics
3. <https://www.laser.com.ve>
4. www.nanowerk.com
5. www.brainscape.com
6. <https://www.open2study.com/courses/basic-physics>