Programme Structure

School of Engineering & Technology

Diploma in Electrical Engineering
With Specialisation in Electric Vehicle

Programme Code: 0105

Batch: 2025-2028

Vision of the University

To be recognized as an Institution of excellence, facilitating learning, fostering creativity, knowledge creation, innovations, consultancy and leadership in multiple areas to build a conscious community that will positively impact living beings for a sustainable future.

Mission of the University

1. **Offers a wide range of Undergraduate and Post graduate Courses.**
   To create conducive environment for an interactive and application oriented experiential learning making the Institute a preferred destination for work and study.
2. **Research, Innovation, Consultancy & Entrepreneurial Culture**
   To Foster creativity, research and innovation orientation in students and faculty in basic and applied areas in all of its disciplines, provide cost effective solutions and nurture entrepreneurial capabilities to accelerate growth.
3. **Social Relevance with local actions on global thoughts**
   To act as a catalyst in social change by developing academic, social, political, technological, scientific, industrial and business leadership in the spirit "Think Globally and Act Locally"; by providing ample opportunities to develop team spirit, sportsmanship and love for culture and national heritage.

Core Values

Integrity
Leadership
Diversity
Community

Vision of the School of Polytechnic

To become a center of excellence for providing quality and value based education in the field of diploma engineering that will produce skilled technocrats to meet industry requirements.

Mission of the School of Polytechnic

- To provide technical knowledge and skills by using latest engineering tools.
- To facilitate industry-institute interaction to explore the industrial knowledge of the students.
- To inculcate ethical and professional values among students.
- To impart quality education to the students coming from rural parts and to conduct different curricular & co-curricular activities to enhance the academic.

Core Values

Integrity
Leadership
Diversity
Community

Programme Educational Objectives (PEO's)

PEO 1. To provide solid foundation in electrical engineering along with good communication and entrepreneurship skills for tackling social issues.

PEO 2. To impart students with good scientific and engineering knowledge in order to analyse, design and create novel products for giving practical solutions to real life problems.

PEO 3. To create engineers with sound technical knowledge for facing all sorts of challenges in industry or in pursuance of higher studies.

PEO 4. To motivate students, to acquire aptitude for lifelong learning along with leadership skills, team spirit and ethical values so that they upgrade themselves with the latest trends in the field of engineering in order to serve the society.

PROGRAMME OUTCOMES (POs)

PO 1. Basic and Discipline specific knowledge: Apply knowledge of basic mathematics, science and engineering fundamentals and engineering specialization to solve the engineering problems.

PO 2. Problem analysis: Identify and analyse well-defined engineering problems using codified standard methods.

PO 3. Design/ development of solutions: Design solutions for well-defined technical problems and assist with the design of systems components or processes to meet specified needs.

PO 4. Engineering Tools, Experimentation and Testing: Apply modern engineering tools and appropriate technique to conduct standard tests and measurements.

PO 5. Engineering practices for society, sustainability and environment: Apply appropriate technology in context of society, sustainability, environment and ethical practices.

PO 6. Project Management: Use engineering management principles individually, as a team member or a leader to manage projects and effectively communicate about well-defined engineering activities.

PO 7. Life-long learning: Ability to analyse individual needs and engage in updating in the context of technological changes.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO 1. An ability to specify, design and analyse systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO 2. An ability to analyse and design electrical machinery, electrical/electronic circuits, electrical/solid state drive systems, lighting systems and deliver technological solution by assimilating advances in allied disciplines.

PSO 3. An ability to specify, design, implement and test analog and embedded signal processing electronic systems using the state of the art components and software tools.

PSO 4. An ability to analyse, design and implement the learning in electrical instrumentation, control and automation applications.

SDGI GLOBAL UNIVERSITY, GHAZIABAD

SCHOOL OF ENGINEERING & TECHNOLOGY

SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN ELECTRICAL ENGINEERING (ELECTRIC VEHICLE)

W.E.F. Session: 2025-26 **(Batch: 2025-2028)** **Semester - I**

S. No	Status	Paper Code	Subjects	Study Scheme Lec / Week			Hours	Credits	CIE	ESE	Total	Pass Marks
				L	T	P						
1	DSC	D01AS25101	*Applied Mathematics - I	4	0	-	4	4	50	50	100	40
2	DSC	D01AS25102	*Applied Physics	3	0	-	3	3	50	50	100	40
3	OE	D010525103	Fundamentals of Civil Engineering	3	0	-	3	3	50	50	100	40
4	AEC	BSGUAE2401	*English Language Proficiency	2	0	-	2	2	50	50	100	40
5	DSC	D010525104	Fundamentals of Electrical Engineering	4	0	-	4	4	50	50	100	40
6	DSC	D01AS25152	*Applied Physics Lab	-	-	2	2	1	60	40	100	40
7	OE	D010525153	Fundamentals of Civil Engineering Lab	-	-	2	2	1	60	40	100	40
8	DSC	D010525154	Fundamentals of Electrical Engineering Lab	-	-	2	2	1	60	40	100	40
9	OE	D010625160	*Engineering Drawing Lab	-	-	4	4	2	60	40	100	40
10	SEC	D01SE24161	*General Workshop Practice-I	-	-	6	6	3	60	40	100	40
Total				16	0	16	32	24	550	450	1000	400

*Subjects denotes the subject that are common with other Diploma programs

Semester-1st

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- APPLIED MATHEMATICS – I			
A.Y 2025-26	**Course Code- D01AS25101**	**Batch- 2025-28**	**CIE Marks- 50 (MM)**
Total Teaching Hours: 46	**Total Credits- 4**		**ESE Marks- 50 (MM)**
Type of Course- Theory			**Total Marks- 100 (MM)**

Course Objectives/Course Description

This course offers a fundamental understanding of elementary mathematics and its applications in engineering problem-solving. Students will learn to utilize key mathematical functions, including logarithms, partial fractions, matrices, as well as basic 2D geometry and curves. By mastering these concepts, students will gain the necessary skills to address engineering challenges across all disciplines effectively.

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	**Algebra-I** **1.1** Polynomials, degree of Polynomials, Minimisation of Polynomials. **1.2** Solution of Linear equations, Solution of Quadratic Equations. (Factorisation method, By using formula) **1.3** Series : AP and GP; Sum, nth term, Mean **1.4** Matrices and Determinants: Matrix, Types and basic properties, Elementary properties of determinant of order 2 and 3, Consistency of equation, Crammer's rule.	**10 Hours**
2	**Algebra -II** **2.1** Complex number: Complex numbers, Representation, Modulus and amplitude Demoivre theorem, its application in solving algebraic equations. **2.2** Addition and subtraction of Vectors, Resolution of vectors, Dot and Cross product of Vectors.	**08 Hours**
3	**Trigonometry and Inverse Trigonometric Functions** **3.1** Graphs of Trigonometric Functions, effect of Magnitude scaling and time scales, time shifting (phase shifting). **3.2** Trigonometric Functions and Identities. **3.3** Inverse Trigonometric functions: Simple case only.	**08 Hours**
4	**Differential Calculus - I** **4.1** Functions, limits, continuity, functions and their graphs, range and domain, elementary methods of finding limits (right and left), elementary test for continuity and differentiability. **4.2** Methods of finding derivative, Trigonometric functions, exponential function, Function of a function, Logarithmic differentiation, Differentiation of Inverse trigonometric function, Differentiation of implicit functions.	**10 Hours**
5	**Differential Calculus - II** **5.1** Higher order derivatives, Simple applications. **5.2** Application - Finding Tangents, Normal, Points of	**10 Hours**

	Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, Velocity, Acceleration.	

Course Outcomes:

CO1: Identify and apply methods for solving linear and quadratic equations, including Cramer's rule**.(K3)**
CO2: Illustrate operations with complex numbers and vectors, including dot and cross products. **(K3)**
CO3: Apply trigonometric identities and graph transformations for various engineering problems**.(K3)**
CO4: Identify and explain continuity, differentiability, and compute derivatives using standard methods**.(K3)**
CO5: Apply derivatives to find tangents, normals, and analyze functions for maxima, minima, and rates of change**.(K3)**

Text books:

1. Applied Mathematics-I by Kailash Sinha and Varun Kumar; Aarti Publication, Meerut.
2. Applied Mathematics-I by Chauhan and Chauhan, Krishna Publications, Meerut.
3. Applied Mathematics-I by Chauhan and Chauhan, Krishna Publications, Meerut.

Reference books:

1. Elementary Engineering Mathematics by BS Grewal, Khanna Publishers, New Delhi
2. Engineering Mathematics, Vol I & II by SS Sastry, Prentice Hall of India Pvt. Ltd.

Assessment method: (Continuous Internal Assessment = 50%, Final Examination = 50%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester- 1st**
Course Name- APPLIED PHYSICS			
A.Y 2025-26	**Course Code- D01AS25102**	**Batch- 2025-28**	**CIE Marks- 50 (MM)**
Total Teaching Hours: 38	**Total Credits- 3**		**ESE Marks- 50 (MM)**
Type of Course- Theory			**Total Marks- 100 (MM)**

Course Objectives/Course Description

Physics is a field that explores various subjects relevant to our surroundings. It seeks to understand the natural world through observation and predicting how objects interact. The course emphasizes a strong understanding of physical laws and their practical applications in engineering and technology across different disciplines. Through this study, students gain insights into the behaviour of objects and their relevance in real-world scenarios.

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	**Fundamentals of Units, Measurement, Errors and Vector Analysis** **1.1** Need of Measurement, physical Quantity - fundamental and derived, systems of units (FPS, CGS and SI units), Dimensions and dimensional formulae of physical quantities. conversion of numerical values of physical quantities from one system of units into another **1.2** Error in measurement, accuracy and precision of instruments, percentage error, Combination of errors in addition, subtraction, multiplication, division and powers, rules for representing significant figures in calculation. **1.3** Scalar and vector quantities – examples, representation of vector, types of Vectors, Unit Vector, Vector Addition and Subtraction, Triangle and Parallelogram law (Statement only), difference between vector and scalar addition using examples, Scalar and Vector Product, Resolution of Vectors using the example of stationary object, falling object, moving object.	**08 Hours**
2	**Force and Motion** **2.1** Force, Momentum, Statement of Conservation of linear momentum, discuss using examples such as recoil of gun, Impulsive force and its examples, **2.2** Circular motion (Uniform and Non-uniform), definition of angular, displacement, angular velocity, angular acceleration, frequency, time period, Relation between linear and angular velocity, linear acceleration and angular acceleration (numerical practice) Centripetal and centrifugal forces with examples such as banking of roads and bending of cyclist, Principle of centrifuge, Application of various forces in lifts, cranes, large steam engines and turbines.	**08 Hours**
3	**Work, Power and Energy**	**06 Hours**
	3.1 Work: and its units, examples of zero work, positive work and negative work, conservative and non-conservative force, Friction: modern concept, types, laws of limiting friction, Coefficient of friction and its Engineering Applications, Work done in moving an object on horizontal and inclined plane for rough and plane surfaces with its applications	

	Application of Friction in brake system of moving vehicles, bicycle, scooter, car trains etc. **3.2** Power and its units, calculation of power in numerical problems **3.3** Energy and its units: Kinetic energy and potential energy with examples and their derivation, work energy theorem, Principle of conservation of mechanical energy for freely falling bodies, examples of transformation of energy.	
4	**Rotational Motion and Gravitational Force** **4.1** Concept of translatory and rotatory motions with examples, Definition of torque with examples, Angular momentum, Conservation of angular momentum and its examples **4.2** Moment of inertia and its physical significance, radius of gyration for rigid body, Theorems of parallel and perpendicular axes (statements only), Moment of inertia of rod, disc, ring and sphere (hollow and solid) (Formulae only). Concept of Fly wheel. **4.3** Rotational kinetic energy, Rolling of sphere on the slant plane, Comparison of linear motion and rotational motion, Application of rotational motions in transport vehicles, and machines **4.4** Gravitational force, Acceleration due gravity and its variation	**08 Hours**
5	**Properties of Matter & Thermodynamics** **5.1** Elasticity: definition of stress and strain, different types of moduli of elasticity, Hooke's law, significance of stress strain curve **5.2** Pressure: definition, its units, atmospheric pressure, gauge pressure, absolute pressure, Fortin's Barometer and its applications **5.3** Surface tension: concept, its units, angle of contact, Capillary action and determination of surface tension from capillary rise method, applications of surface tension, effect of temperature and impurity on surface tension **5.4** Viscosity and coefficient of viscosity: Terminal velocity, Stoke's law and effect of temperature on viscosity, application in hydraulic systems. **5.5** Concept of fluid motion, stream line and turbulent flow, Reynold's number Equation of continuity, Bernoulli's Theorem and their applications **5.6** Difference between heat and temperature, Modes of transfer of heat (Conduction, convection and radiation with examples), Different scales of temperature and their relationship, Isothermal and Adibatic process, Zeroth, First and second law of thermodynamics, Heat engine (concept Only), Carnot cycle, Application of various systems of thermometry in refrigeration and air-conditioning etc	**08 Hours**

Course Outcomes

CO1: Identify and explain fundamental units, measurement systems, and error analysis in physical calculations. **(K2)**

CO2: Illustrate the principles of force, momentum, and conservation of linear momentum with real-life applications. **(K2)**

CO3: Apply the concepts of work, power, and energy in solving engineering problems related to mechanical systems**. (K3)**

CO4: Identify the application of rotational motion and moment of inertia in real-world mechanical and structural designs**. (K2)**

CO5: Demonstrate the principles of thermodynamics, surface tension, and fluid mechanics in practical engineering scenarios. **(K3)**

Text books:

1. Text Book of Physics for Class XI (Part-I, Part-II); N.C.E.R.T., Delhi
2. Text Book of Applied Physics-I by P. S. Kushwaha; Bharat Bharati Prakashan, Meerut.
3. Text Book of Applied Physics-I by P.Gupta; Asian Publishers, Meerut.

Reference books:

1. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
2. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd.
3. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
4. Engineering Physics by DK Bhhatacharya & Poonam Tandan; Oxford University Press.
5. Modern Engineering Physics by SL Gupta, Sanjeev Gupta, Dhanpat Rai Publications
6. Physics-I by V. Rajendran, Tata McGraw-Hill raw Hill publication, New Delhi.

Assessment method: (Continuous Internal Assessment = 50%, Final Examination = 50%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- FUNDAMENTALS OF CIVIL ENGINEERING			
A.Y 2025-26	**Course Code- D010525103**	**Batch- 2025-28**	**CIE Marks- 50 (MM)**
Total Teaching Hours: 36	**Total Credits- 3**		**ESE Marks- 50 (MM)**
Type of Course- Theory			**Total Marks- 100 (MM)**

Course Objectives/Course Description

Civil Engineering diploma holders have to supervise construction of various types of civil works involving use of various materials like stones, bricks and tiles, cement and cement based products, lime, timber and wood based products, paints and varnishes, metals and other miscellaneous materials.

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	**Construction Materials** **1.1** Properties and uses of various construction materials such as stones, lime, cement etc. **1.2** Introduction to bricks **1.3** Content and timber with their properties **1.4** Physical/field testing, elements of brick masonry	**08 Hours**
2	**Foundation:** **2.1** Bearing capacity of soil and its importance **2.2** Types of various foundations and their salient features, **2.3** Suitability of various foundations for heavy	**06 Hours**
3	**Concrete:** **3.1** Definition of concrete **3.2** Various ingredients of concrete **3.3** Different grades of concrete, water cement ratio, workability **3.4** Physical/field testing of concrete **3.5** Mixing of concrete, placing and curing of concrete.	**08 Hours**
4	**RCC:** **4.1** Definition of RCC, Basics Use of RCC structure in Construction. **4.2** Basics of reinforced cement concrete and its use (elementary knowledge). **4.3** Introduction to various structural elements of a building.	**08 Hours**
5	**Stone:** **5.1** Definition of rocks, General characteristics of stones **5.2** Requirements of good building stones **5.3** Identification of common building stones **5.4** Uses of good building stones	**06 Hours**

Course Outcomes

CO1: Identify and explain the properties and field applications of common construction materials such as stones, bricks, lime, cement, and timber. **(K2)**

CO2: Illustrate the types and suitability of foundations based on soil bearing capacity and load requirements. **(K3)**

CO3: Apply knowledge of concrete mix components, grades, and curing processes to assess concrete quality in field conditions**.(K3)**

CO4: Identify and describe the basic components and uses of reinforced cement concrete structures in construction**.(K2)**

CO5: Classify various types of building stones and analyze their characteristics and suitability for construction purposes**.(K3)**

Text Books:

1. A Text Book on Civil Engineering by Anshul Agarwal; Asian Publications, Muzaffarnagar.
2. A Text Book on Civil Engineering by Sanjay Gupta & Pradeep Kumar; Krishna Prakashan Media (P) Ltd., Meerut.

Reference Books:

1. Surendra Singh; "Engineering Materials;" New Delhi, Vikas Publishing HousePvt.
2. Bahl, SK; "Engineering Materials;" Delhi, Rainbow Book Co.
3. TTTI, Chandigarh "Civil Engineering Materials:" New Delhi Tata McGraw Hill Publication
4. SCRangawala,"Construction Materials", Charotar Publishers
5. Alam Singh, "Constrution Materials"
6. Construction Materials by D.V. Gupta, Asian Publishers Distributors, Mujaffarnagar.

Assessment method: (Continuous Internal Assessment = 50%, Final Examination = 50%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- ENGLISH LANGUAGE PROFICIENCY			
A.Y 2025-26	**Course Code- BSGUAE2401**	**Batch- 2025-28**	**CIE Marks- 50 (MM)**
Total Teaching Hours: 30	**Total Credits- 2**		**ESE Marks- 50 (MM)**
Type of Course- Theory			**Total Marks- 100 (MM)**

Course Objectives/Course Description

Proficiency in the Hindi & English language plays a pivotal role in advancing one's career. This subject focuses on instilling fundamental principles of effective communication while prioritizing the cultivation of essential skills such as active listening, articulate speaking, proficient reading, and proficient writing as integral components of Communication Skills development.

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	**English Grammar and Usage** Parts of Speech, Tenses: Past, Present, Future, Subject-Verb Agreement, Active and Passive Voice, Direct and Indirect Speech	**06 Hours**
2	**Vocabulary Building** Synonyms and Antonyms, Word Formation, Idioms and Phrases, Homophones and Homonyms, One Word Substitutions**.**	**06 Hours**
3	**Reading and Comprehension** Techniques for Effective Reading, Skimming and Scanning, Summarizing and Paraphrasing, Comprehension Passages, Analysing Texts	**06 Hours**
4	**Writing Skills** Essay Writing: Argumentative, Descriptive, Narrative, Letter Writing: Formal and Informal, Report Writing, Email Writing, Creative Writing	**06 Hours**
5	**Literature and Critical Thinking** **5.1** Short Stories **5.1.1**"The Last Leaf" by O. Henry **5.1.2**"The Necklace" by Guy de Maupassant **5.2** Poems **5.2.1**"The Road Not Taken" by Robert Frost **5.2.2**"If" by Rudyard Kipling **5.3** Drama **5.3.**1Excerpts from "Macbeth" by William Shakespeare **5.4** Literary Analysis and Interpretation	**06 Hours**

Course Outcomes

CO1: Identify and apply the rules of English to form sentences. **(K1)**
CO2: Recognize and use appropriate vocabulary to enhance communication. **(K1)**
CO3: Demonstrate reading comprehension skills by applying techniques like skimming, scanning, summarizing, and analyzing texts. **(K3)**
CO4: Apply writing skills for essays, letters, reports, and emails using correct structure and format. **(K3)**
CO5: Discuss literary texts, including short stories, poems, and drama, to develop critical thinking skills. **(K3)**

Text Books:

1. Communication Skills-I by R. Thakur; Nageen Prakashan, Meerut.
2. Communication Skills-I by Malti Agarwal; Krishna Prakashan Media (P) Ltd., Meerut.

Reference Books:

1. Communicating Effectively in English, Book-I by Revathi Srinivas; Abhishek Publications, Chandigarh.
2. Communication Techniques and Skills by R. K. Chadha; DhanpatRai Publications, New Delhi.
3. High School English Grammar and Composition by Wren & Martin; S. Chand & Company Ltd., Delhi.

Assessment method: (Continuous Internal Assessment = 50%, Final Examination = 50%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- FUNDAMENTALS OF ELECTRICAL ENGINEERING			
A.Y 2025-26	**Course Code- D010525104**	**Batch- 2025-28**	**CIE Marks- 50 (MM)**
Total Teaching Hours: 46	**Total Credits- 4**		**ESE Marks- 50 (MM)**
Type of Course- Theory			**Total Marks- 100 (MM)**

Course Objectives/Course Description

A diploma holder may be involved in various jobs ranging from preventive maintenance of electrical installation to fault location. In addition, he/she may be working in testing laboratories where he/she uses measuring instruments. To carry out these and similar jobs effectively, knowledge of basic concepts, principles and their applications is very essential. This course will enable the students to understand the basic concepts and principles of DC and AC fundamental, ac circuits, batteries, electromagnetic induction, voltage and current sources etc.

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	**Basics of Electrical Energy** **1.1** Advantages and Application of Electrical Energy, Definition of basic terms, such as current, EMF, Potential Difference (PD); Ohm's Law and its limitations; Numerical on Ohm's Law. **1.2** Resistance, Resistivity, Factors affecting resistance; problems on combinations of resistors, open circuit and short circuit. V-I characteristic of Open circuit, Short Circuit and resistive circuit. **1.3** Power, Electrical Energy, their units, Problem on calculation of load and tariff. **1.4** Instruments for the measurement of current, voltage and power with their connection in a circuit. **1.5** Batteries, types and its various connections.	**08 Hours**
2	**DC Circuit Analysis** **2.1** Circuit, Linear and Non-linear, Active and Passive, Unilateral and Bilateral, **2.2** Application of Kirchhoff's current law and Kirchhoff's voltage law to simple circuits. Star – Delta connections and their conversion. **2.3** Voltage Divider & Current Divider Rule, Concept of ideal voltage source and Current source, Inter Conversion of Voltage-Source and Current Source. **2.4** Superposition principle, Thevenin's theorem, Norton's theorem, Maximum Power Transfer Theorem, application of network theorems in solving simple D.C. circuit problems.	**12 Hours**
3	**Electro Magnetic Induction'** **3.1** Magnetism, Magnetic Materials, classical theory of magnetism, flux, reluctance, permeability, hysteresis, hysteresis loop **3.2** Magnetic circuit, concept of magneto-motive force (MMF), analogy between electric and magnetic circuit. Concept of electro-magnetic field produced by flow of electric current, right	**08 Hours**

	hand thumb rule, **3.3** Faraday's laws of electro-magnetic induction, lenz'z law **3.4** Flemings right hand and left hand rule **3.5** Principles of self and mutual induction, self and mutually induced e.m.f.	
4	**AC Fundamentals** **4.1** Concept of alternating quantities **4.2** Difference between AC and DC. Various AC and DC waveforms **4.3** Representation of sinusoidal quantities by phasor diagrams. **4.4** Equation of sinusoidal wave form for an alternating quantity **4.5** Effect of alternating voltage applied to a pure resistance, pure inductance and pure capacitance **4.6** Concept of inductive and capacitive reactance. **4.7** Alternating voltage applied to resistance and inductance in series **4.8** Alternating voltage applied to resistance and capacitance in series **4.9** Alternating voltage applied to resistance, inductance and capacitance in series **4.10** Power in pure resistance, inductance and capacitance, power in combined RLC circuits. Power factor and significance of power factor, active and reactive power and their significance, methods of improving power factor. **4.11** Introduction to series and parallel resonance and its conditions **4.12**Definition of conductance, susceptance, admittance, impedance and their units	**10 Hours**
5	**Polyphase system and Introduction to power plants** Introduction to polyphase a.c. systems, advantages of polyphase system over single phase system, Relations between line and phase value of voltages and currents for star and delta connections and their phasor diagram, power in polyphase circuits.	**08 Hours**

Course Outcomes

CO1: Identify and explain the fundamental electrical quantities including their units and measurements, and apply Ohm's Law to solve basic circuit problems**.(K2)**

CO2: Analyse DC circuits using Kirchhoff's Laws and network theorems**.(K3)**

CO3: Identify and demonstrate the principles of electromagnetism, including Faraday's Laws, magnetic circuits, and their applications in electrical engineering systems**.(K3)**

CO4: Analyse the behaviour of AC circuits, including waveforms, phasor diagrams, impedance, and power factor**.(K3)**

CO5: Identify & Describe the working of polyphase systems. **(K2)**

Text Books:

1. A Text book on electrical engineering by Rakesh Mohan; Navbharat Prakashan, Delhi.
2. A Text book on electrical engineering by Ashish Shahu & B K Sharma; Krishna Prakashan Media (P) Ltd., Meerut.
3. A Text book on electrical engineering by Vinay Kumar Sharma; Krishna Prakashan Media (P) Ltd., Meerut.
4. A Text book on electrical engineering by Rahul Wadhwa; Asian Publishers, Muzaffarnagar.

Reference Books:

1. Basic Electrical Engineering by PS Dhogal, Tata Mc Graw-Hill Education Pvt Ltd., New Delhi.
2. Experiments in Basic Electrical Engineering by SK Bhattacharya, KM Rastogi; New Age International (P) Ltd.; Publishers New Delhi.

3. Electrical Technology by BL Theraja, S Chand and Co, New Delhi.
4. Basic Electrical Engineering by JB Gupta; SK Kataria and Sons, New Delhi.
5. Basic Electrical Engineering by Asfaque Husain, Jain Book Depot, New Delhi

Assessment method: (Continuous Internal Assessment = 50%, Final Examination = 50%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- APPLIED PHYSICS LAB			
A.Y 2025-26	**Course Code- D01AS25152**	**Batch- 2025-28**	**CIE Marks- 60 (MM)**
Total Teaching Hours: 02/Weeks	**Total Credits- 1**		**ESE Marks- 40 (MM)**
Type of Course- Practical			**Total Marks- 100 (MM)**

Course Objectives/Course Description

The Applied Physics Lab introduces students to the practical application of fundamental physical principles through hands-on experiments. This course complements the theoretical knowledge of mechanics, properties of matter, and thermodynamics covered in the lecture sessions. Through experiments involving measurement techniques, vector mechanics, rotational motion, elasticity, viscosity, and energy conservation, students will gain a deeper understanding of physical laws and develop essential experimental and analytical skills. The course emphasizes accuracy in observation, safe laboratory practices, data recording, and analysis.

Experiment No.	Experiment Name	No. of Teaching hours/ (Labs)
1	To find radius of wire and its volume and the maximum permissible error in these quantities by using both screw gauge.	
2	To find diameter of metallic bob and use it to calculate its volume. Also Find the maximum permissible error in these quantities by using Vernier callipers.	
3	To verify parallelogram law of vector addition and Subtraction.	
4	To find the Moment of Inertia of a flywheel about its axis of rotation.	
5	To find the value of acceleration due to gravity on the surface of earth by using a simple pendulum.	
6	To study conservation of energy of a ball or cylinder rolling down an inclined plane.	
7	To determine the viscosity of glycerin by Stoke's method	
8	To determine force constant of spring using Hooks law	
9	Simulation Practical-1	
10	Simulation Practical-2	

Course Outcomes

CO1: Identify and explain the concepts of polynomials, quadratic equations, and their applications in engineering problem-solving. **(K2)**

CO2: Illustrate arithmetic and geometric progressions and apply their formulas for solving real-world numerical problems.**(K2)**

CO3: Apply matrix operations, including determinants and Cramer's rule, to solve systems of linear equations**.(K3)**

CO4: Identify the application of trigonometric identities, inverse trigonometric functions, and their graphical representations in practical scenarios. **(K2)**

CO5: Demonstrate differentiation techniques to determine tangents, normals, and points of maxima/minima in engineering contexts. **(K3)**

Text books:

1. Text Book of Physics for Class XI (Part-I, Part-II); N.C.E.R.T., Delhi
2. Text Book of Applied Physics-I by P. S. Kushwaha; Bharat Bharati Prakashan, Meerut.
3. Text Book of Applied Physics-I by P.Gupta; Asian Publishers, Meerut.

Reference books:

1. Concepts in Physics by HC Verma, Vol. I & II, Bharti Bhawan Ltd. New Delhi
2. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd.
3. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi
4. Engineering Physics by DK Bhhatacharya & Poonam Tandan; Oxford University Press.
5. Modern Engineering Physics by SL Gupta, Sanjeev Gupta, Dhanpat Rai Publications
6. Physics-I by V. Rajendran, Tata McGraw-Hill raw Hill publication, New Delhi.

Assessment method: (Continuous Internal Assessment = 60%, Final Examination = 40%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- FUNDAMENTALS OF CIVIL ENGINEERING LAB			
A.Y 2025-26	**Course Code- D010525153**	**Batch- 2025-28**	**CIE Marks- 60 (MM)**
Total Teaching Hours: 2/Week	**Total Credits- 1**		**ESE Marks- 40 (MM)**
Type of Course- Practical			**Total Marks- 100 (MM)**

Course Objectives/Course Description

Civil Engineering diploma holders have to supervise construction of various types of civil works involving use of various materials like stones, bricks and tiles, cement and cement based products, lime, timber and wood based products, paints and varnishes, metals and other miscellaneous materials.

Experiment No.	Experiment Name	No. of Teaching hours/ (Labs)
1	**Testing of bricks** Shape and size	
2	Soundness Test	
3	Water absorption	
4	Crushing strength	
	Testing of concrete	
5	Slump test	
6	Compressive Strength of concrete cube.	
7	Classify rocks and identify particular type of stones.	
8	The students should be taken to different construction sites to show them various construction materials, concreting process and construction of RCC structural elements, foundations and other civil works.	
9	Basics of AutoCAD and Draw the 2D Floor Plan of a one Storey building.	
10	Draw the 2D Floor Plan of an industrial workshop.	

Course Outcomes

CO1: Identify and perform physical and mechanical property tests on bricks to determine suitability for construction. **(K3)**

CO2: Illustrate concrete workability using slump test and evaluate compressive strength through cube testing .**(K3)**

CO3: Classify rocks and identify common building stones based on physical characteristics and practical relevance**.(K2)**

CO4: Apply field observation skills to identify various civil materials and RCC construction processes at construction sites.**(K3)**

CO5: Develop 2D floor plans for simple residential and industrial structures using AutoCAD**.(K3)**

Text Books:

1. A Text Book on Civil Engineering by Anshul Agarwal; Asian Publications, Muzaffarnagar.
2. A Text Book on Civil Engineering by Sanjay Gupta & Pradeep Kumar; Krishna Prakashan Media (P) Ltd., Meerut.

Reference Books:

1. Surendra Singh; "Engineering Materials;" New Delhi, Vikas Publishing HousePvt.

2. Bahl, SK; "Engineering Materials;" Delhi, Rainbow Book Co.
3. TTTI, Chandigarh "Civil Engineering Materials:" New Delhi Tata McGraw Hill Publication
4. SCRangawala,"Construction Materials", Charotar Publishers
5. Alam Singh, "Constrution Materials"
6. Construction Materials by D.V. Gupta, Asian Publishers Distributors, Mujaffarnagar.

Assessment Method: (Continuous Internal Assessment = 60%, Final Examination = 40%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- FUNDAMENTALS OF ELECTRICAL ENGINEERING LAB			
A.Y 2025-26	**Course Code- D010525154**	**Batch- 2025-28**	**CIE Marks- 60 (MM)**
Total Teaching Hours: 2/week	**Total Credits- 1**		**ESE Marks- 40 (MM)**
Type of Course- Practical			**Total Marks- 100 (MM)**

Course Objectives/Course Description

A diploma holder may be involved in various jobs ranging from preventive maintenance of electrical installation to fault location. In addition, he/she may be working in testing laboratories where he/she uses measuring instruments. To carry out these and similar jobs effectively, knowledge of basic concepts, principles and their applications is very essential. This course will enable the students to understand the basic concepts and principles of DC and AC fundamental, ac circuits, batteries, electromagnetic induction, voltage and current sources etc.

Experiment No.	Experiment Name	No. of Teaching hours/ (Labs)
1	To study and Draw the VI characteristics of various circuit components using CRO.	
2	To verify Ohm's law.	
3	To verify the laws of series and parallel connection of resistance	
4	To verify the laws of series and parallel connection of capacitance	
5	To verify Kirchhoff's laws.	
6	To measure the resistance of an ammeter and a voltmeter and to conclude that ammeter has very low resistance whereas voltmeter has very high resistance.	
7	To Connect Ammeter, Voltmeter, wattmeter & energy meter in an AC circuit.	
8	To test a battery for charged and discharged condition and to make connections for it's charging.	
9	To convert the given galvanometer into voltmeter and an ammeter.	
10	To measure power in a 3-phase system using one Wattmeter method.	

Course Outcomes

CO1: Identify and explain the characteristics of various electrical components using a CRO**.(K2)**
CO2: Apply Ohm's Law and Kirchhoff's Laws to verify series and parallel circuit behavior**.(K3)**
CO3: Illustrate the correct method to connect ammeter, voltmeter, wattmeter, and energy meter in an AC circuit. **(K3)**
CO4: Identify the application of batteries by testing their charged and discharged conditions and setting up charging connections**.(K2)**
CO5: Demonstrate power measurement in a three-phase system using the one-wattmeter method**.(K3)**

Text Books:

1. A Text book on electrical engineering by Rakesh Mohan; Navbharat Prakashan, Delhi.
2. A Text book on electrical engineering by Ashish Shahu & B K Sharma; Krishna Prakashan Media (P) Ltd., Meerut.
3. A Text book on electrical engineering by Vinay Kumar Sharma; Krishna Prakashan Media (P) Ltd., Meerut.

4. A Text book on electrical engineering by Rahul Wadhwa; Asian Publishers, Muzaffarnagar.

Reference Books:

1. Basic Electrical Engineering by PS Dhogal, Tata Mc Graw-Hill Education Pvt Ltd., New Delhi.
2. Experiments in Basic Electrical Engineering by SK Bhattacharya, KM Rastogi; New Age International (P) Ltd.; Publishers New Delhi.
3. Electrical Technology by BL Theraja, S Chand and Co, New Delhi.
4. Basic Electrical Engineering by JB Gupta; SK Kataria and Sons, New Delhi.
5. Basic Electrical Engineering by Asfaque Husain, Jain Book Depot, New Delhi

Assessment method: (Continuous Internal Assessment = 60%, Final Examination = 40%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- ENGINEERING DRAWING LAB			
A.Y 2025-26	**Course Code- D010625160**	**Batch- 2025-28**	**CIE Marks- 60 (MM)**
Total Teaching Hours: 40	**Total Credits- 2**		**ESE Marks- 40 (MM)**
Type of Course- Practical			**Total Marks- 100 (MM)**

Course Objectives/Course Description

Drawing is the language of engineers and technicians. Reading and interpreting engineering drawing is their day to day responsibility. The subject is aimed at developing basic graphic skills in the students so as to enable them to use these skills in preparation of engineering drawings, their reading and interpretation. The emphasis, while imparting instructions, should be to develop conceptual skills in the students following BIS SP 46 – 1988.

Note:

i) First angle projection is to be followed

ii) Minimum of 18 sheets to be prepared and atleast 2 sheets on AutoCAD

iii) Instructions relevant to various drawings may be given along with appropriate demonstrations, before assigning drawing practice to students

Experiment No.	Experiment Name	No. of Teaching hours/ (Labs)
1	**INTRODUCTION** Introduction to drawing instruments, materials, layout and sizes of drawing sheets and drawing boards. Different types of lines in Engineering drawing as per BIS specifications. Practice of vertical, horizontal and inclined lines, geometrical figures. Dimensioning of overall sizes, circles, threaded holes, chamfered surfaces, angles, tapered surfaces, holes, equally spaced on P.C.D., counter sunk holes, counter bored holes, cylindrical parts, narrow spaces and gaps, radii, curves and arches, Scales – their needs and importance (theoretical instructions), type of scales, Definition of R.F. and length of scale.	**8 Hours**
2	**Orthographic Projection** Theory of orthographic projections (Elaborate theoretical instructions), Projection of Points in different quadrant, Projection of Straight Line (1st and 3rd angle), Line parallel to both the planes, Line perpendicular to any one of the reference plane, Line inclined to any one of the reference plane. Three views of orthographic projection of different objects. (At least one sheet in 3rd angle).	**8 Hours**
3	**Projection of Solid** Definition and salient features of Solid, to make projections, sources, Top view, Front view and Side view of various types of Solid. Convention sectional representation of various materials, conventional breaks.	**8 Hours**
4	**Scales (Plain and Diagonal type)** Scales –their needs and importance (theoretical instructions), type of scales. Definition of R.F. and length of scale, drawing of plain and diagonal scales.	**8 Hours**
5	**Basic of various commands in AutoCAD** Basic introduction and operational instructions of various commands in	**8 Hours**

	AutoCAD. At least two sheets on AutoCAD of cube, cuboid, cone, pyramid, truncated cone and pyramid, sphere and combination of above solids.	

Course Outcomes

CO1: Identify and explain the use of drawing instruments, materials, and types of lines as per BIS standards. **(K2)**

CO2: Illustrate orthographic projections of points, lines, and planes in the first and third angles. **(K3)**

CO3: Apply principles of dimensioning to represent engineering objects accurately. **(K3)**

CO4: Construct projections of solid objects, including sectional views, using engineering conventions**. (K3)**

CO5: Use AutoCAD to create basic engineering drawings, including 3D representations of objects. **(K3)**

Text Books:

1. A Text Book of Engineering Drawing by V. K. Goyal; Bharati Publications, Meerut.
2. A Text Book of Engineering Drawing by K. K .Gupta; Asian publications, Muzaffarnagar.

Reference Books:

1. A Text Book of Engineering Drawing by Surjit Singh; Dhanpat Rai & Co., Delhi
2. Engineering Drawing by PS Gill; SK Kataria & Sons, New Delhi
3. Elementary Engineering Drawing in First Angle Projection by ND Bhatt; Charotar Publishing House Pvt. Ltd., Anand
4. Engineering Drawing I & II by JS Layall; Eagle Parkashan, Jalandhar.

Assessment method: (Continuous Internal Assessment = 60%, Final Examination = 40%)

School Name- School of Engineering & Technology			
Program- Diploma in Electrical Engineering (Electric Vehicle)			**Semester-1st**
Course Name- GENERAL WORKSHOP PRACTICE-I			
A.Y 2025-26	**Course Code-D01SE24161**	**Batch-2025-2028**	**CIE Marks-60(MM)**
Total Teaching Hours-46	**Total Credits-3**		**ESE Marks-40(MM)**
Type of Course- Practical			**Total Marks 100(MM)**

Course Objectives/Course Description

In order to have a balanced overall development of diploma engineers, it is necessary to integrate theory with practice. General workshop practices are included in the curriculum in order to provide hands-on experience about use of different tools and basic manufacturing practices. This subject aims at developing general manual and machining skills in the students. In addition, the development of dignity of labour, safety at work place, team working and development of right attitude are the other objectives.

UNIT	Experiment Name	No. of Teaching hours/ (Labs)
1	**CARPENTRY SHOP** **1.1 General Shop Talk** **1.1.1** Name and use of raw materials used in carpentry shop : wood & alternative materials **1.1.2** Names, uses, care and maintenance of hand tools such as different types of Saws, C-Clamp, Chisels, Mallets, Carpenter's vices, Marking gauges, Try-squares, Rulers and other commonly used tools and materials used in carpentry shop by segregating as cutting tools, supporting tools, holding tools , measuring tools etc. **1.1.3** Specification of tools used in carpentry shop. **1.1.4** Different types of Timbers, their properties, uses & defects. Seasoning of wood. **1.2 Practice** **1.2.1** Practices for Basic Carpentry Work **1.2.2** Sawing practice using different types of saws **1.2.3** Assembling jack plane — Planning practice including sharpening of jack plane cutter **1.2.4** Chiselling practice using different types of chisels including sharpening of chisel **1.2.5** Making of different types of wooden pin and fixing methods. Marking measuring and inspection of jobs. **1.3 Job Practice** **1.3.1** Job 1 Marking, sawing, planning and chiselling and their practice **1.3.2** Job II Half Lap Joint (cross, L or T – any one) **1.3.3** Job III Mortise and Tenon joint (T-Joint) **1.3.4** Job IV Dove tail Joint (Lap or Bridle Joint) **1.3.5** Demonstration of job showing use of Rip Saw, Bow saw and Tenon saw, method of sharpening various	**10 Hours**

	saws.	
2	**PAINTING AND POLISHING SHOP** 1.1 Introduction of paints, varnishes, Reason for surface preparation, Advantages of Painting, other method of surface coating ie. Electroplating etc. **Job Practice** Job 1: To prepare a wooden surface for painting apply primer on one side and to paint the same side. To prepare french polish for wooden surface and polish the other side. Job II: To prepare metal surface for painting, apply primer and paint the same. Job III: To prepare a metal surface for spray painting, first spray primer and paint the same by spray painting gun and compressor system. The sequence of polishing will be as follows: i) Abrasive cutting by leather wheel ii) Polishing with hard cotton wheel and with polishing material 1.1 iii) Buffing with cotton wheel or buff wheel.	**10 Hours**
3	**ELECTRICAL SHOP** 3.1 Study, demonstration and identification of common electrical materials with standard ratings and specifications such as wires, cables, switches, fuses, cleats, clamps and allied items, tools and accessories. 3.2 Study of electrical safety measures and protective devices. Job I Identification of phase, Neutral and Earth wires for connection to domestic electrical appliances and their connections to three pin plugs. Job II Carrying out house wiring circuits using fuse, switches, sockets, ceiling rose etc. in batten or P.V.C. casing-caping 3.3 Study of common electrical appliances such as auto electric iron, electric kettle, ceiling/table fan, desert cooler etc. 3.4 Introduction to the construction of lead acid battery and its working. Job III Installation of battery and connecting two or three batteries in series and parallel.	**10 Hours**
4	**WELDING SHOP** 4.1 Introduction and importance of welding as compared to other material joining processes. Specifications and type of welding machines, classification and coding of electrodes, welding parameters, welding joints and welding positions. Materials to be welded, safety precautions. 4.2 Job Practice 4.2.1 Job I Practice of striking arc (Minimum 4 beads on 100 mm long M.S. flat). 4.2.2 Job II Practice of depositing beads on plate at different	**08 Hours**

	current levels. (Minimum 4 beads on M.S. plate at four setting of current level). 4.2.3 Job III Preparation of lap joint using arc welding process. 4.2.4 Job IV Preparation of T-joint using gas welding or arc welding on 100 mm x 6 mm MS Flat	
5	**PLUMBING SHOP** 5.1 Use of personal protective equipment, safety precautions while working and leaning of shop. 5.2 Introduction and demonstration of tools, equipment and machines used in plumbing shop. 5.3 Introduction of various pipes and pipe fittings of elbow, nipple, socket, union etc. 5.4 Job Practice 5.4.1 Job 1 : Preparation of job using elbow, bend and nipple 5.4.2 Job II: Preparation of job using Union, Tap, Plug and Socket. 5.4.3 Job III: Threading practice on pipe with die	**08 Hours**

Course Outcomes

CO1: Apply carpentry tools and techniques to perform basic wood joining operations like lap, mortise-tenon, and dovetail joints.

CO2: Perform surface preparation and apply painting, polishing, and spray painting on wood and metal surfaces.

CO3: Demonstrate basic electrical wiring, appliance connection, and battery installation with safety measures.

CO4: Apply arc and gas welding techniques to prepare simple welded joints like lap and T-joints.

CO5: Use plumbing tools and fittings to assemble pipe connections and perform basic threading operations.

Text books:

1. Workshop Technology I,II,III, by SK Hajra, Choudhary and AK Choudhary; Media
2. Promoters and Publishers Pvt. Ltd. Mumbai.
3. Workshop Technology Vol. I, II, III by Manchanda; India Publishing House,Jalandhar.
4. Workshop Training Manual Vol. I, II by S.S. Ubhi; Katson Publishers, Ludhiana.

Reference books:

1. Manual on Workshop Practice by K Venkata Reddy; MacMillan India Ltd., NewDelhi
2. Basic Workshop Practice Manual by T Jeyapoovan; Vikas Publishing House (P) Ltd.,New Delhi

Assessment method: (Continuous Internal Assessment = 60%, Final Examination = 40%)