Programme Structure

School of Engineering & Technology

Diploma in Mechanical Engineering (With specialisation in Production)

Programme Code: 0106

Batch: 2024-2027

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 Postgraduate 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,

Core Values

Integrity

Leadership

Diversity

Community

Vision of the School

To become a centre 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

- 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 (PEOs)

PEO 1. Possess a solid foundation in mechanical engineering theory and practice, as well as the ability to solve problems and solve them, allowing them to develop, evaluate, and build efficient mechanical systems and procedures.

PEO 2. To create engineers with sound technical knowledge for facing all sorts of challenges in industry or in pursuance of higher studies.

PEO 3. To motivate students, to acquire attitude 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. Modern tool usages: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools, including prediction and modelling, to complex engineering activities with an understanding of the limitations.

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. Anability to apply principles of mechanical engineering, including mechanics, thermodynamics, fluid mechanics, heat transfer, materials science, manufacturing processes, and machine design to solve complex engineering problems.

PSO 2. Proficient in the use of modern engineering tools and software for modelling, simulation, analysis, and design of mechanical systems. They will be able to utilize CAD/CAM, FEA, and other computational tools to enhance engineering solutions.

PSO 3. Capability to design and develop mechanical systems, components, and processes that meet specific requirements, considering public health and safety, cultural, societal, and environmental factors.

PSO 4. Able to collaborate effectively with professionals from other engineering disciplines and fields of study. They will possess the skills to work in multidisciplinary teams, bringing mechanical engineering expertise to diverse projects and innovations.

SDGI GLOBAL UNIVERSITY, GHAZIABAD

SCHOOL OF ENGINEERING & TECHNOLOGY

SCHEME OF STUDIES AND EVALUATION FOR DIPLOMA IN MECHANICAL ENGINEERING (PRODUCTION)

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	AEC	BSGUAE2401	*English Language Proficiency	2	0	-	2	2	50	50	100	40
4	DSC	D01AS25104	*Applied Chemistry	4	0	-	4	4	50	50	100	40
5	SEC	BSGUSE2410	*Office Automation	2	0	-	2	2	25	25	50	20
6	DSC	D01AS25152	*Applied Physics Lab	-	-	2	2	1	60	40	100	40
7	DSC	D01AS25154	*Applied Chemistry Lab	-	-	2	2	1	60	40	100	40
8	DSC	D010625160	*Engineering Drawing Lab	-	-	4	4	2	60	40	100	40
9	SEC	BSGUSE2460	*Office Automation Lab	-	-	2	2	1	30	20	50	20
10	SEC	D01SE24161	*General Workshop Practice - I	-	-	6	6	3	60	40	100	40
Total				15	0	16	31	23	495	405	900	360

*Subjects denotes the subject which are common with other Diploma Programs

Semester-1st

School Name- School of Engineering & Technology			
Program- Diploma in Mechanical Engineering (Production)			**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 Maxima/Minima, Increasing/Decreasing functions, Rate, Measure, Velocity, Acceleration.	**10 Hours**

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 and Technology			
Program- Diploma in Mechanical Engineering (Production)			**Semester-1st**
Course Name- Applied Physics			
A.Y 2025-26	**Course Code-D01AS25102**	**Batch-2025-2028**	**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 behavior 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**
2	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)	**08**
3	3.1 Work: and its units, examples of zero work, positive work and negative work, conservative and non-conservative force. 3.2 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. 3.3 Power and its units, calculation of power in numerical problems	**06**
4	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**
5	**Properties of Matter & Thermodynamics** 5.1 Elasticity: definition of stress and strain, different types of module 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**

Course Outcomes

CO1: Apply the fundamentals of units, dimensions, and error analysis in physical measurements and scientific calculations.

CO2: Resolve and analyze vector quantities, and apply vector algebra to physical situations like motion and forces.

CO3: Compute work, power, and understand friction and energy in mechanical systems using basic physical principles.

CO4: Apply the concepts of rotational motion, torque, moment of inertia, and gravitation to real-world mechanical systems.

CO5: Understand and apply principles of elasticity, fluid mechanics, surface tension, viscosity, and thermodynamics in engineering applications.

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. Text Book of Physics for Class XI (Part-I, Part-II); N.C.E.R.T., Delhi
2. Concepts in Physics by HC Verma, Vol. I & II, BhartiBhawan Ltd. New Delhi
3. Comprehensive Practical Physics, Vol, I & II, JN Jaiswal, Laxmi Publications (P) Ltd.
4. Engineering Physics by PV Naik, Pearson Education Pvt. Ltd, New Delhi

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

School Name- School of Engineering and Technology			
Program- Diploma in Mechanical Engineering (Production)			**Semester- 1st**
Course Name- English Language Proficiency			
A.Y 2025-26	**Course Code- BSGUAE2401**	**Batch-2025-2028**	**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

The use of various chemicals and chemical products in diverse technical and Engineering fields have repeatedly proved the importance of Applied Chemistry, which enhances its role to a new peak. On the other hand, ever increasing use of such materials will compel engineers, technocrats to acquire essential applied chemistry knowledge in order to select engineering materials, which not only suit them but also provide more environmental compatibility. This situation demands principles of Applied Chemistry in diploma engineering courses. Principles of Applied Chemistry will enable budding engineers and technocrats to develop scientific temper and appreciate physical, chemical and engineering properties of materials.

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	**English Grammar and Usage** 1.1 Parts of Speech, Tenses: Past, Present, Future, Subject-Verb Agreement, Active and Passive Voice, Direct and Indirect Speech	**6**
2	**Vocabulary Building** 2.1 Synonyms and Antonyms, Word Formation, Idioms and Phrases, Homophones and Homonyms, One Word Substitutions	**6**
3	**Reading and Comprehension** 3.1 Techniques for Effective Reading, Skimming and Scanning, Summarizing and Paraphrasing, Comprehension Passages, Analysing Texts	**6**
4	**Writing Skills** 1.1 Essay Writing: Argumentative, Descriptive, Narrative, Letter Writing: Formal and Informal, Report Writing, Email Writing, Creative Writing	**6**
5	**Literature and Critical Thinking** 4.1 Short Stories 4.1.1 "The Last Leaf" by O. Henry 4.1.2 "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 5.3.1 Excerpts from "Macbeth" by William Shakespeare 5.4 Literary Analysis and Interpretation	**6**

Course Outcomes

CO1: Identify and apply the rules of English to form sentences.

CO2: Recognize and use appropriate vocabulary to enhance communication.

CO3: Demonstrate reading comprehension skills by applying techniques like skimming, scanning, summarizing, and analyzing texts.

CO4: Apply writing skills for essays, letters, reports, and emails using correct structure and format.

CO5: Discuss literary texts, including short stories, poems, and drama, to develop critical thinking skills.

Text books:

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

Reference books:

1. Communicating Effectively in English, Book-I by RevathiSrinivas; 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 and Technology			
Program- Diploma in Mechanical Engineering (Production)			**Semester-1st**
Course Name- Applied Chemistry			
A.Y 2025-26	**Course Code-D01AS25104**	**Batch-2025-2028**	**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

The use of various chemicals and chemical products in diverse technical and Engineering fields have repeatedly proved the importance of Applied Chemistry, which enhances its role to a new peak. On the other hand, ever increasing use of such materials will compel engineers, technocrats to acquire essential applied chemistry knowledge in order to select engineering materials, which not only suit them but also provide more environmental compatibility. This situation demands principles of Applied Chemistry in diploma engineering courses. Principles of Applied Chemistry will enable budding engineers and technocrats to develop scientific temper and appreciate physical, chemical and engineering properties of materials.

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	**Atomic Model and Chemical Bonding** 1.1 Bohr's model of atom and successes and limitations of atomic theory (qualitative treatment only). 1.2 Atomic number, atomic mass number isotopes and isobars 1.3 Definition of orbit and orbitals, shapes of s and p orbitals only, quantum numbers and their significance, Aufbau's principle, Pauli's exclusion principle and Hund's rule 1.4 Electronic configuration of elements with atomic number (Z) = 30 only. Modern periodic law and periodic table, groups and Hours, classification of elements into s, p, d and f blocks (periodicity in properties - excluded). 1.5 Chemical bonding and cause of bonding.	**10**
2	**Fuels** 2.1 Definition of fuel, Calorific value-higher calorific value, lower calorific value, classification of fuels, characteristics of good fuel, relative merits of gaseous, liquid and solid fuels, Determination of calorific value fuel using Bomb calorimeter. 2.2 Coal - types of coal and proximate analysis of coal Petroleum and its refining process, Fuel rating – Octane number and Cetane number. 2.3 Gaseous fuels like natural gas (CNG), LPG, producer gas, water gas and biogas, their calorific value and applications. Elementary idea on – hydrogen as future fuels	**10**
3	**Water** 3.1 Demonstration of water resources on Earth using pie chart. Classification of water – soft water and hard water, types of hardness, causes of hardness, units of hardness – mg per liter (mgL^{-1}) and part per million (ppm) and simple numerical. Removal of hardness -Permutit process and Ion-exchange process	**10**

	3.2 pH and buffer solutions and their applications 3.3 Physico-Chemical methods for Water Quality Testing a) Determination of pH using pH meter, total dissolved solids (TDS) b) Testing and Estimation of- alkalinity, indicator their types and application total hardness by EDTA method (chemical reaction of EDTA method are excluded). c) Understanding of Indian Water Quality standards as per WHO.	
4	**Electrochemistry & Corrosion** 4.1 Redox Reaction, Electrochemical cell (Galvanic and Electrolytic), application of electrochemistry – electroplating, galvanisation 4.2 Definition of corrosion and factors affecting corrosion rate. 4.3 Theories of a) Dry (chemical) corrosion & b) Wet corrosion in acidic atmosphere, Galvanic series 4.4 Corrosion control: Internal corrosion preventive measures	**08**
5	**Organic compounds, Polymers and Plastics** 5.1 Classification of organic compounds and IUPAC Nomenclature 5.2 Functional Groups and IUPAC Nomenclature 5.3 Definition of polymer, monomer and degree of polymerization 5.4 Classification of addition and condensation polymers with suitable examples (PE, PS, PVC, Teflon, Nylon -66 and Bakelite). Applications of polymers in industry and daily life. 5.5 Definition of plastics, thermo plastics and thermo setting plastics with suitable examples, distinctions between thermo and thermo setting plastics.	**08**

Course Outcomes

CO1: Apply fundamental atomic structure models and electronic configurations to explain chemical bonding and element classification.

CO2: Classify different types of fuels, evaluate their calorific values, and explain fuel processing and applications.

CO3: Differentiate between types of water hardness, apply methods for its removal, and perform basic water quality analysis.

CO4: Explain redox reactions and apply electrochemical concepts in corrosion prevention and electrochemical applications.

CO5: Classify organic compounds and polymers, and apply IUPAC rules to name compounds and distinguish types of plastics.

Text books:

1. Chemistry in Engineering by J.C. Kuricose & J. Rajaram, Tata McGraw Hill, Publishing Company Limited, New Delhi.
2. Engineering Chemistry by P.C. Jain & Monika Jain, Dhanapat Rai Publishing Company, New Delhi.

Reference books:

1. Eagle's Applied Chemistry - I by S. C. Ahuja & G. H. Hugar, Eagle Prakashan, Jalandhar.
2. Engineering Chemistry – A Text Book by H. K. Chopra & A. Parmar, Narosa Publishing House, New Delhi.
3. Applied Chemistry - I by Dr. P. K Vij & Shiksha Vij, Lords Publications, Jalandhar.

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

School Name- School of Engineering & Technology			
Program- Diploma In Mechanical Engineering			**Semester-1st**
Course Name- OFFICE AUTOMATION			
A.Y: 2025-2026	**Course Code-** BSGSUE2410	**Batch: 2025-28**	**CIE Marks-25**
Total Teaching Hours-2Hr/Week	**Total Credits-02**		**ESE Marks-25**
Type of Course- Theory			**Total Marks-50**

Course Objectives/Course Description

This subject aims to cover the handling of whole field of word processing. It also involves various clerical tasks, such as organizing customer data or creating reports. It enables people with lower skill levels to perform higher-level tasks. In Today's commercial world, automation helps the users with a sophisticated set of commands to format, edit, and print text documents. It is used as valuable and important tools in the creation of application such as newsletters, brochures, charts, presentation, documents, drawings and other graphic images. This will make the students proficient in office automation applications**.**

UNIT	Topics	No. of Teaching hours/ (Lecture)
1	Microsoft Word Basics & Advanced Features	**06**
	1.1 Introduction to Microsoft Word • Basic features of Word processors (Microsoft Word/Libre Office/Open Office). • Overview of the user interface: ribbon, quick access toolbar, navigation pane. 1.2 Formatting Documents • Changing fonts, font sizes, and colors. • Using bold, italic, and underline to emphasize text. • Working with subscript and superscript. 1.3 Document Layout • Justifying text (left, right, center, and full). • Using bullets and numbering to create lists. • Page setup: Margins, orientation, page size. 1.4 Headers, Footers, and Page Breaks • Inserting page numbers, headers, and footers. • Managing page breaks and section breaks. • Adjusting line spacing and paragraph settings. 1.5 Advanced Features: Mail Merge and Macros • Creating a mail merge for letters, labels, or envelopes. • Introduction to macros: Creating, recording, and using macros to automate repetitive tasks.	
2	Microsoft Word Tables & Document Enhancement	**06**
	2.1 Working with Tables • Inserting and formatting tables. • Merging and splitting cells. • Adding borders, shading, and formatting table content. • Inserting and deleting rows and columns. 2.2 Proofing Tools • Applying spelling and grammar checks. • Using the thesaurus for alternative word suggestions.	

	• Setting up autocorrect options. 2.3 Creating Professional Documents • Designing brochures using templates. • Page setup for documents and print preview options. • Printing documents: Full and selected pages. 2.4 Document Navigation and Protection • Adding bookmarks and hyperlinks for document navigation. • Using features like password protection, track changes, and comments.	
3	Microsoft Excel Basics & Data Manipulation	**06**
	3.1 Introduction to Microsoft Excel • Overview of the Excel interface. • Creating, saving, and opening workbooks. 3.2 Cell Management & Data Entry • Adding, deleting, and merging cells. • Formatting cells and adjusting row/column layout. • Using predefined functions: SUM, AVERAGE, COUNT, etc. 3.3 Working with Multiple Worksheets • Switching between multiple worksheets and workbooks. • Creating linked data between worksheets. 3.4 Advanced Excel Features • Using LOOKUP and VLOOKUP functions. • Working with formulas and applying automatic calculations. • Creating and formatting different types of charts.	
4	Microsoft PowerPoint Basics & Presentation Techniques	**06**
	4.1 Introduction to PowerPoint • Overview of PowerPoint interface. • Creating and saving presentations using slide templates. 4.2 Adding and Formatting Content • Adding text, images, tables, and charts. • Applying transitions and animations to slides 4.3 Multimedia Elements in PowerPoint • Inserting movies, sounds, and audio clips. • Customizing slide layout and color schemes. 4.4 Presenting and Sharing PowerPoint's • Viewing presentations using slide navigator. • Running and printing presentations. • Exporting PowerPoint presentations as PDFs or videos.	
5	**G Suite (Google Workspace) & Collaborative Tools**	**06**
	5.1 Introduction to Google Drive • Creating, uploading, and organizing files/folders in Google Drive. • Sharing files with permissions (view, edit, comment). 5.2 Google Docs and Sheets • Creating and sharing Google Docs for collaboration. • Using Google Sheets to manage and share data. • Collaborative features: Comments, suggestions, and real-time editing. 5.3 Google Slides and Forms • Creating and sharing Google Slides for presentations. • Designing Google Forms for surveys and data collection. 5.4 Integration and Cloud Collaboration • Integrating Google Docs, Sheets, and Slides within Drive. • Best practices for real-time collaboration and version control.	
CO1: Describe the basic concepts of computer systems, operating systems, and their role in office automation. (K2) **CO2:** Demonstrate proficiency in word processing tools for creating, formatting, and managing professional documents. (K3)		

CO3: Apply spreadsheet functions and formulas for data entry, analysis, and visualization in office-related tasks. (K3)
CO4: Prepare and design effective presentations using multimedia features for professional communication. (K3)
CO5: Utilize database and internet applications for information storage, retrieval, and office communication. (K2)

Text Books:

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi

Reference Books:

1. Fundamentals of Information Technology by VipinArora, Eagle Parkashan, Jalandhar
2. Computer Fundamentals by P.K Sinha; BPB Publication, New Delhi

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

School Name- School of Engineering and Technology			
Program- Diploma in Mechanical Engineering (Production)			**Semester-1st**
Course Name- Applied Physics Lab			
A.Y 2025-26	**Course Code-D01AS25152**	**Batch-2025-2028**	**CIE Marks-60(MM)**
Total Teaching Hours-2Hours/Week	**Total Credits-1**		**ESE Marks-40(MM)**
Type of Course- Practical			**Total Marks 100(MM)**

Course Objectives/Course Description

The diploma holder in Mechanical Engineering needs to have hands-on knowledge of basic electrical measurements and electronic circuits, which they will encounter in their professional careers.

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 glycerine 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: Apply screw gauge and Vernier callipers to measure dimensions, compute volume, and evaluate maximum permissible errors.

CO2: Verify vector addition laws and analyze vector quantities using experimental methods.

CO3: Determine moment of inertia and gravitational acceleration through practical experiments.

CO4: Apply principles of energy conservation, viscosity, and elasticity in physical systems through lab experiments.

CO5: Demonstrate understanding of physical laws through simulation-based practicals and interpret results accordingly.

Text books:

4. Text Book of Physics for Class XI (Part-I, Part-II); N.C.E.R.T., Delhi
5. Text Book of Applied Physics-I by P. S. Kushwaha; Bharat Bharati Prakashan, Meerut.
6. 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 and Technology			
Program- Diploma in Mechanical Engineering (Production)			**Semester-Ist**
Course Name- Applied Chemistry Lab			
A.Y 2025-26	**Course Code-D01AS25154**	**Batch-2025-2028**	**CIE Marks-60(MM)**
Total Teaching Hours-2Hours/week	**Total Credits-1**		**ESE Marks-40(MM)**
Type of Course- Practical			**Total Marks 100(MM)**

Course Objectives/Course Description

The use of various chemicals and chemical products in diverse technical and Engineering fields have repeatedly proved the importance of Applied Chemistry, which enhances its role to a new peak. On the other hand, ever increasing use of such materials will compel engineers, technocrats to acquire essential applied chemistry knowledge in order to select engineering materials, which not only suit them but also provide more environmental compatibility. This situation demands principles of Applied Chemistry in diploma engineering courses.

Experiment No.	Experiment Name	No. of Teaching hours/ (Labs)
1	Estimation of total hardness of water using standard EDTA solution	
2	Estimation of total alkalinity of given water sample by titrating it against standard sulphuric acid solution	
3	Proximate analysis of solid fuel)	
4	Estimation of temporary hardness of water sample by O' Hener's Method	
5	Determination of flash and fire point of given lubricating oil using Able's flash point apparatus	

Course Outcomes

CO1: Estimate total hardness of water using standard EDTA titration method.

CO2: Determine total alkalinity of water sample through acid-base titration.

CO3: Perform proximate analysis to evaluate properties of solid fuels.

CO4: Analyze temporary hardness of water using O'Hener's method.

CO5: Determine flash and fire point of lubricating oil using Able's apparatus.

Text books:

1. Chemistry in Engineering by J.C. Kuricose & J. Rajaram, Tata McGraw Hill, Publishing Company Limited, New Delhi.
2. Engineering Chemistry by P.C. Jain & Monika Jain, Dhanapat Rai Publishing Company, New Delhi.

Reference books:

1. Eagle's Applied Chemistry - I by S. C. Ahuja & G. H. Hugar, Eagle Prakashan, Jalandhar.
2. Engineering Chemistry – A Text Book by H. K. Chopra & A. Parmar, Narosa Publishing House, New Delhi.
3. Applied Chemistry - I by Dr. P. K Vij & Shiksha Vij, Lords Publications, Jalandhar.

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

School Name- School of Engineering and Technology			
Program- Diploma in Mechanical Engineering (Production)			**Semester-1st**
Course Name- Engineering Drawing Lab			
A.Y 2025-26	**Course Code- D010625160**	**Batch-2025-2028**	**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 at least 2 sheets on AutoCAD

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

UNIT	Experiment Name	No. of Teaching hours/ (Labs)
1	**Introduction to Engineering Drawing & Dimensioning Technique** 1.1 Introduction to drawing instruments, materials, layout and sizes of drawing 1.2 Sheets and drawing boards 1.3 Different types of lines in Engineering drawing as per BIS specifications 1.4 Practice of vertical, horizontal and inclined lines, geometrical figures such as Necessity of dimensioning, method and principles of dimensioning (mainly theoretical instructions) 1.5 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 1.6 Scales –their needs and importance (theoretical instructions), type of scales, 1.7 Definition of R.F. and length of scale	**8**
2	**English Reading & Writing Practices** 2.1 Theory of orthographic projections (Elaborate theoretical instructions) 2.2 Projection of Points in different quadrant 2.3 Projection of Straight Line (1st and 3rd angle) 2.3.1 Line parallel to both the planes	**8**

	2.3.2 Line perpendicular to any one of the reference plane 2.3.3 Line inclined to any one of the reference plane. 2.4 Projection of Plane – Different lamina like square, rectangular, triangular and circle inclined to one plane, parallel and perpendicular to another plane in 1st angle only. 2.5 Three views of orthographic projection of different objects. (At least one sheet in 3rd angle) 2.6 Identification of surfaces	
3	**Projection of Solid** 3.1 Definition and salient features of Solid 3.2 Types of Solid (Polyhedron and Solid of revolution) 3.3 To make projections, sources, Top view, Front view and Side view of various types of Solid 3.4 Importance and salient features Sections 3.5 Drawing of full section, half section, partial or broken out sections, Offset sections, revolved sections and removed sections 3.6 Convention sectional representation of various materials, conventional breaks	**8**
4	**Isometric Views and Common Symbols used in Engineering** 4.1 Fundamentals of isometric projections and isometric scale. 4.2 Isometric views of combination of regular solids like cylinder, cone, cube and Civil Engineering sanitary fitting symbols 4.3 Electrical fitting symbols for domestic interior installations	**8**
5	**Basic of various commands in AutoCAD** Basic introduction and operational instructions of various commands in utoCAD. At least two sheets on AutoCAD of cube, cuboid, cone, pyramid, truncated cone and pyramid, sphere and combination of above solids. *** Auto CAD drawing will be evaluated internally by sessional marks and not by final theory paper.**	**8**

Course Outcomes

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

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

CO3: Apply principles of dimensioning to represent engineering objects accurately.

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

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

Text 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

Reference books:

1. Elementary Engineering Drawing in First Angle Projection by ND Bhatt; Charotar Publishing House Pvt. Ltd., Anand
2. 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 Mechanical Engineering (Production)			**Semester-1st**
Course Name- OFFICE AUTOMATION LAB			
A.Y 2025-26	**Course Code- BSGUSE2460**	**Batch- 2025-28**	**CIE Marks- 30 (MM)**
Total Teaching Hours: 2Hour/week	**Total Credits-2**		**ESE Marks- 20 (MM)**
Type of Course- Practical			**Total Marks- 50 (MM)**

Course Objectives/Course Description

Information technology has great influence on all aspects of life. Primary purpose of using computer is to make the life easier. Almost all work places and living environment are being computerized. The subject introduces the fundamentals of computer system for using various hardware and software components. In order to prepare diploma holders to work in these environments, it is essential that they are exposed to various aspects of information technology such as understanding the concept of information technology and its scope; operating a computer; use of various tools using MS Office/Open Office/Libre Office using internet etc., form the broad competency profile of diploma holders. This exposure will enable the students to enter their professions with confidence, live in a harmonious way and contribute to the productivity.

Experiment No.	Experiment Name	No. of Teaching hours/ (Labs)
1	Tools to be used: Microsoft office/ Libre Office / Open Office / G Suite	
	PRACTICING MS WORD	
2	Creating a document using different font, changing font size and colour, changing the appearance through bold/italic/underline.	
3	Creating a document using subscript and superscript, justification of the document.	
4	Create a document using Bullets and Numbering.	
5	Create a document using page number, header and footer.	
6	Create a document using inserting page breaks and column break, line spacing.	
7	How to use mail merge and macro in MS Word.	
8	Creating table, formatting cells, use of different border styles, shading in tables, merging of cells, and partition of cells, inserting and deleting a row in a table in MS word document.	
9	Apply spelling checker, grammar mistakes, thesaurus in a document.	
10	Create a Boucher using templates, page setup and print preview, and then print that document.	
	PRACTICING MS EXCEL	
11	Working on spread sheet like adding, deleting, merging cells, layout and style.	
12	Create a table and perform operation using predefined function on it.	
13	In MS Excel procedure to switching between different spread sheets and workbook.	
14	Create a spread sheet and print selected as well as full workbook.	

15	Create a spread sheet with LOOKUP/VLOOKUP features.	
16	Create different charts in excel and implement formulas (automatic and use defined).	
	PRACTICING MS POWERPOINT	
17	Create a Power Point presentation using slide template.	
18	Create a Power Point presentation using animation.	
19	Create a Power Point presentation using transition	
20	Create a Power Point Presentation with Adding movie and sound.	
21	Create a Power Point Presentation with Adding tables and chart etc.	
22	Changing slide colour scheme in presentation.	
23	Viewing the presentation using slide navigator.	
24	Create, Save, Run and Print the Power Point Presentation.	
25	Create a database table using predefined template.	
26	Create a database form using form wizard.	
27	Create and share files/folders in Google drive	
28	Create and share Google docs.	
29	Create and share Google sheets.	
30	Create and share Google Forms. And create and share Google slides.	

Course Outcomes

CO1: *Identify and explain the functions of basic computer hardware, operating systems, and installation procedures.***(K2)**

CO2: *Illustrate file and folder management operations, antivirus usage, and document scanning and printing techniques.***(K3)**

CO3: *Apply basic internet operations such as browsing, downloading, and using email with attachments.***(K3)**

CO4: *Use MS Word and Excel/Open Office tools to create, format, analyze, and manipulate professional documents and spreadsheets.***(K3)**

CO5: *Create multimedia presentations and collaborate using Google Docs, Sheets, Slides, and Drive.*(**K3)**

Text Books:

1. Fundamentals of Computer by V Rajaraman; Prentice Hall of India Pvt. Ltd., New Delhi
2. Information Technology for Management by Henery Lucas, Tata McGraw Hills, New Delhi

Reference Books:

1. Fundamentals of Information Technology by Vipin Arora, Eagle Parkashan, Jalandhar
2. Computer Fundamentals by P.K Sinha; BPB Publication, New Delhi

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

School Name- School of Engineering and Technology			
Program- Diploma in Mechanical Engineering (Production)			**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- 6 Hrs/Week	**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	**10**

	saw and Tenon saw, method of sharpening various saws.	
2	**PAINTING AND POLISHING SHOP** 2.1 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**
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**
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 current levels. (Minimum 4 beads on M.S. plate at four setting of current level).	**8**

	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	**8**

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%)