**Diploma in Mechanical Engineering**

**(3 Years) Semester System**

**(MECD3PUP)**

**Batch 2022 Onwards**

**Program & Courses Outcomes**

**Logo

Description automatically generated**

**FACULTY OF ENGINEERING**

**PUNJABI UNIVERSITY, PATIALA**

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Program Specific Outcomes:**   1. To Prepare and interpret drawings of engineering components. 2. Develop an ability to communicate effectively. 3. Acquire an ability to apply knowledge of mathematics, science, and engineering to find solutions of various problems in manufacturing industry. 4. Inculcate an ability to equip the proficiency of practical skills needed in workshop practice essential in industry. 5. Apply modern engineering tools and appropriate techniques to conduct standard test and measurements. 6. Conduct measurements using appropriate tools and techniques, analysis and interpretation of data, and synthesis of information to provide valid conclusions. 7. Successfully practice or apply the principles of Mechanical Engineering in a variety of employment areas and can explore self-employment opportunities. 8. Function effectively in various production systems as an individual or member of a team working on specific project. 9. Ability to analyze individual needs and equipping himself with latest technological updates. | |

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| **Program Name:**  Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** English and Communication Skills | **Course Code**: MECD1101T |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Understand the facts of Literature from Short Stories and Poetry 2. Solve vocabulary Exercise Based on selective Reading. 3. Acquire the knowledge about kinds of communications, process and objectives of communications. 4. Use grammar, tenses, voice, Pair of speech. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Applied Chemistry | **Course Code**: MECD1102T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Apply the fundamental principles of measurement, matter, atomic theory, chemical periodicity, chemical bonding, general chemical reactivity and solution chemistry to subsequent courses in science. 2. To acquire knowledge about the fundamental principles of bonding in materials. 3. Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost. 4. Apply their knowledge for protection of different metals from corrosion 5. Basic knowledge of organic compounds and their common names | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Applied Mathematics-I | **Course Code**: MECD1103T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Perform algebraic operations on the complex numbers. 2. Find out the numbers of ways in which a given number of object can be arranged. 3. Recognize and use the vocabulary of angles. 4. Calculate the probability of success or failure. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Applied Mechanics | **Course Code**: MECD1104T |
| **Course Outcomes:** At the end of this course, the students will be able to:   1. Understand the fundamental system of units and dimensions of different physical quantities. 2. Understand various scalar and vector quantities linked to the force and motion topics. 3. Develop knowledge regarding how to find the resultant of vectors and resolution of vectors. 4. Understand the work, power and energy relations and methods to calculate these quantities. The knowledge regarding different types of friction their effect on different bodies will also be learnt. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Engineering Drawing | **Course Code**: MECD1105T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. To understand the basics of engineering drawing, lettering, scales and projections. 2. To learn to draw the projections of points, lines, planes and solids 3. To learn to draw the projections of technical drawing of threads and hexagonal & square nuts. 4. To draw and understand the drawing of isometric and sectional views. 5. To learn the basic drawings of various mechanical components used in mechanical engineering. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** English and Communication Skills Lab | **Course Code**: MECD1151P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. How to Locate books in Library 2. To look up words in a dictionary meaning and pronunciation of words. 3. To seek information from Encyclopaedia. 4. Paper reading and unseen Passage 5. Introducing oneself others and leave taking etc. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Applied Chemistry Lab | **Course Code**: MECD1152P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Students can be able to prepare various concentration solutions like molar, normal, ppm, etc. 2. Develop in the student the ability to record scientific experimental processes, analyze results, draw conclusions, write reports and present their work orally 3. The students will learn the method to prepare iodoform from ethanol or acetone. 4. To acquire practical knowledge on the techniques for the preparation bakelite. 5. To prepare the Mohr’s salt from ferrous sulphate and ammonium sulphate. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Computer Graphics Lab | **Course Code**: MECD1153P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Interact with the modeling software used for drawing. 2. Learn the basic drafting techniques of drawing various geometric entities. | |

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| **Program Name**: Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name**: Workshop Practice-I | **Course Code**: MECD1154P |
| **Course Outcomes**: At the end of this course, the student will be able to:   1. To develop the basic working knowledge required for the production of various engineering products. 2. To understand the Design different sheet metal working processes 3. Demonstrate operation such as Turning, Facing, Threading, Knurling and Grooving on   Centre Lathe.   1. to understand the metal cutting and joining by the welding 2. To develops the knowledge about wood working. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Professional and Technical Communication | **Course Code**: MECD1201T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. understand various tools to achieve an effective technical communication through the use of MS Power Point, MS Word and MS Excel. 2. prepare and deliver power point presentations. All the tools helpful in making the technical communication more concise will be understood by the students. 3. prepare technical project reports through the use of various tools of MS Word, like headings, automatic table of contents, figure and table captions etc. 4. develop skills related to working in MS Excel. Making calculations, creating graphs, etc. will promote the technical communication in an effective way. | |

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| **Program Name**: Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name**: Applied Physics | **Course Code**: MECD1202T |
| **Course Outcomes**: At the end of this course, the student will be able to:   1. Apply concepts in interference and diffraction to solve relevant numerical problems and to relate to relevant engineering applications. 2. To design and conduct simple experiments as well as analyze. 3. Find how to extend the basic concepts of motion of charged particles in electric magnetic fields to solve numerical problems. 4. To develops the knowledge about working of laser. 5. Understand theory of semiconductors and their applications in some semiconductor devices. 6. Summarize basics of magnetism and superconductivity. Explore a few of their technological applications. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Basic Electrical & Electronics Engineering | **Course Code**: MECD1203T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Understand the basic electrical and electronics engineering terminologies, definitions, units, laws and relationship between different terms. 2. Apply the knowledge of theorems/laws to analyze the simple circuits 3. Understand and Analyze the AC fundamentals, AC circuits, phase relation and quality factor 4. Select the electrical machines for different applications. 5. To learn basic principle of transistor, working of its different configurations and applications in electronic circuits. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Applied Mathematics-II | **Course Code**: MECD1204T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Find the determinant of a product of square matrices, of the transpose of a square matrix, and the inverse of an invertible matrix. 2. Compare and contrast the ideas of continuity and differentiability. 3. Integrate indefinite integrals using integration by parts. 4. Calculate mean, mode and median. 5. Obtain an approximate set of solution function values to a second order boundary value problem using a finite diffraction equation. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Basics of management | **Course Code**: MECD1205T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Understand the concepts related to Business. 2. Explain the primary functions of management. 3. Demonstrate the roles, skills and functions of management. 4. Describe common organizational structures and their advantages and disadvantages. 5. Describe organizational culture, and explain how culture can be a competitive advantage. 6. Differentiate between leadership and management. 7. Identify the traits, dimensions, and styles of effective leaders 8. Explain the importance of employee motivation in an organization. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Professional and Technical Communication Lab | **Course Code**: MECD1251P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Practice of MS word Learning various features. 2. Preparing bio data/ resume in MS word 3. Perform Group Discussion Activity. 4. Do an activity related to Professional telephonic conversations. | |

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| **Program Name**: Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name**: Applied Physics lab | **Course Code**: MECD1252P |
| **Course Outcomes**: At the end of this course, the student will be able to:   1. Develop skills to impart practical knowledge in real time solution 2. Understand principle, concept, working and application of new technology and comparison of results with theoretical calculations. 3. Understand the working of laser and CRO. 4. Understand various laws of physics by drawing the graphs. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Basic Electrical & Electronics Engineering Lab | **Course Code**: MECD1253P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. To learn measurements of resistance of an ammeter and a voltmeter. 2. Determination of voltage current relationship in a dc circuit under specific physical conditions. 3. Understand the uses of various measuring instruments. 4. Observation of change in resistance of bulb in hot and cold condition using voltmeter and ammeter. | |

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| **Program Name**: Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name**: Workshop practice-II | **Course Code**: MECD1254P |
| **Course Outcomes**: At the end of this course, the student will be able to:   1. It provides knowledge about the construction, function, use and application of different working tools, equipment, machines as well as the technique of manufacturing a product from its raw material. 2. Students will be able to understand the various welding techniques. 3. The student will have gain a broad knowledge of sand casting, Pattern making, requirement of pattern materials, different pattern materials and designing of the pattern, Molding and core making. 4. Students will be gain knowledge about the various machining techniques and wood working techniques.   . | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Course Name:** Theory of Machines | **Course code:** MECD2301T |
| Course Outcomes  Mechanical devices are characterized by the fact that they have mobility and must move to perform their function. The subject gives insights to kinematics and dynamics of machines  that is concerned with understanding the relationship between the geometry and the motions of the parts of a machine and the forces that produce this motion.  On completing the course, the student will be able to:   1. Understand the fundamentals of the theory of kinematics and dynamics of machines. 2. Understand techniques for studying motion of machines and their components. 3. Moreover, the student learns to design basic gear trains and basic cam systems. 4. This course contributes to ability to apply knowledge of mathematics, science and engineering to solve engineering problems. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Advance Mechanics | **Course Code**: MECD2302T |
| **Course Outcomes:** At the end of this course, the students will be able to:   1. Understand the concept of moment of force, the Varigon’s theorem and the related concepts. 2. Develop understanding regarding the concept of centre of gravity and its determination through different methods. 3. Develop knowledge regarding simple machines, the mechanical advantage obtained and the efficiency of a machine. 4. Understand the system of pulleys and other useful simple machines along with the concepts of work loss in friction. 5. Understand the working principle and applications of wheel and axles. The expression for the velocity ratio and their application will also be learnt. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: **MECD3PUP** |
| **Course Name:** Manufacturing Processes-I | **Course Code**: MECD2303T |
| **Course Outcomes:**At the end of this course, the student would be able to:   1. Develop an understanding of the various tools and tool materials, along with preliminary knowledge of cutting parameters. 2. Gain an insight into the role of various machining operations such as turning, drilling, boring, shaping, broaching etc. 3. Understanding about the importance of cutting fluids and lubricants in manufacturing processes. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Material Science | **Course Code**: MECD2304T |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Understand the facts of Crystallography unit cell arrangement of atom BCC,FCC and HCP 2. Study of Deformation behaviour and its Mechanisms 3. Theory of Heat Treatment 4. Introduction of Metals and Alloys 5. Study of Advanced Materials | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Self-Employment And Entrepreneurship | **Course Code**: MECD2305T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Understand need of self-employment and self-employment areas in Mechanical Engineering. 2. Know about various support agencies and registration process/ procedure for new enterprise. 3. Understand process of product selection and stages of product development. 4. Need of marketing and management of the critical resources. 5. Analyze success and failures of entrepreneur & self-employer and integrate positive conclusions | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Mechanical Engineering Drawing-I | **Course Code**: MECD2306T |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. To understand the various concepts of engineering drawing. 2. To develop understanding of producing 2D model out of 3D model. 3. Learn the concept of drawing an object of the mechanical engineering. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Course Name:** Theory of Machines Lab | **Course code:** MECD2351P |
| Course Outcomes   1. Determine the kinematic chain and mobility, and perform the kinematic analysis of a given mechanism, 2. Apply the fundamental principles of statics and dynamics to machinery, 3. Understand the fundamentals of Balancing of Masses 4. Understand the fundamentals of power transmission devices | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Advance Mechanics Lab | **Course Code**: MECD2352P |
| **Course Outcomes:** At the end of this course, the students will be able to:   1. have an hands on experience on calculating the mechanical advantage of screw jack, simple when and axles, differential wheel and axle, differential pulley block, simple worm and worm wheel, system of pulleys etc. 2. understand how to practically calculate the velocity ratio and the efficiency in case of inclined plane system.. 3. develop knowledge about centre of gravity of regular and irregular lamina. | |

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| **Program Name:**  Diploma in Mechanical Engineering | **Program Code**: **MECD3PUP** |
| **Course Name:** Manufacturing Processes-I Lab | **Course Code**: MECD2353P |
| **Course Outcomes:**At the end of this course, the student would be able to:   1. Learn to perform the grinding of single point cutting tool, along with various operation of Lathe. 2. Learn to perform various operations on mild steel such as drilling, reaming, counter sinking, boring, and tapping. 3. Learn to perform various shaping operations namely key way cutting and spline cutting. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Material Science Lab | **Course Code**: MECD2354P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Study of heat treatment furnace 2. To seek information of metallurgical microscope and specimen polishing machine. 3. To study annealing , normalizing of given sample and find the difference. 4. To study hardening and tempering of specimen and find out the difference in hardness due to tempering. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Environment Studies | **Course Code:\*\*** |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Gaining in-depth knowledge on natural processes that sustain life and govern economy 2. Developing critical thinking for shaping strategies (scientific, social, economic and legal) for environmental protection and conservation of biodiversity, social equity and sustainable development. 3. Acquiring values and attitudes towards understanding complex environmental economic-social challenges, and participating actively in solving current environmental problems and preventing the future ones. 4. Adopting sustainability as a practice in life, society and industry. 5. Assess the effects of pollution on resources. 6. Identify concept of waste management and methods of recycling | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Hydraulics and Pneumatics | **Course Code**: MECD2401T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Develop an understanding of the basic concepts, properties and behavior of different types of fluids. 2. Apply the concepts of pressure and its measurement. 3. Analyze the fluid flow. 4. Provide hydraulic and pneumatic solutions for automated systems. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Thermodynamics-I | **Course Code**: MECD2402T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Practice the basic thermodynamic concepts, Ideal gas, and characteristic gas equation. 2. Practice the applications of steady flow energy equation 3. Practice the applications of Second law of Thermodynamics 4. Basic concepts and working cycles for thermodynamics cycles.   . | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Course Name:** Strength of Materials | **Course Code:** MECD2403T |
| Course Outcomes: At the end of this course, the student will be able to:   1. Understand the basic concept of simple stresses and strains. 2. Understand and calculate the bending moments and shearing forces in beams. 3. Understand and calculate the stresses during the torsion of circular bars which is necessary for the subsequent designing of shafts, springs and levers. 4. Understand and calculate the strain energies stored during different types of loadings and shall be able to understand the concepts of energy storage in different types of springs. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Course Name:** Manufacturing Processes-II | **Course Code:** MECD2404T |
| Course Outcomes: At the end of this course, the student will be able to:   1. Develop an understanding of the various welding process and their applications, along with preliminary knowledge of welding parameters. 2. Develop an understanding of the casting process, pattern making, mould making, moulding sand properties and their testing. 3. Gain an insight into the role of machining moulding techniques and their importance. 4. Understand the working of Pit furnace and Cupola furnace. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Industrial Engineering | **Course Code**: MECD2405T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Know the concepts of production and productivity. 2. Understand the importance of plant location of the organization as well as layout of the department/work-stations within the organization. 3. Understand the need of method study and time study. 4. Get acquainted with concepts of production planning and controlling. 5. Learn about various types of production systems. 6. Learn about concept of estimation and costing. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Course Name:** Mechanical engineering Drawing-II | **Course Code:** MECD2406T |
| Course Outcomes: At the end of this course, the student will be able to:   1. To understand the various concepts of engineering drawing. 2. To develop understanding of producing 2D model out of 3D model. 3. Learn the concept of drawing an object of the mechanical engineering. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Hydraulics and Pneumatics Lab | **Course Code**: MECD2451P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Measure pressure and maintain different types of pressure gauges. 2. Calculate flow and discharge of various liquids. 3. Apply Bernoulli’s theorem. 4. Maintain hydraulic and pneumatic systems. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Thermodynamics-I Lab | **Course Code**: MECD2452P |
| **Course Outcomes:** At the end of this course, the student will be able to inculcate the practical abilities along with theoretical knowledge. Students shall be able to understand the concepts of:   1. Temperature measurement with thermocouple and infrared thermometer. 2. Boiler mountings and accessories. 3. Working of Air compressor. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Course Name:** Strength of Materials Lab | **Course Code:** MECD2453P |
| Course Outcomes: At the end of this course, the student will be able to:   1. Understand the concept of tensile and bending testing. Shall be able to evaluate the yield point, Young’s Modulous and Flexural rigidity using the Universal Testing Machine. 2. Understand the concept of torsion of circular bars and shall be able to evaluate the torsional rigidity, modulous of rigidity of a circular bar using the Torsion Testing Machine. 3. Understand the concept of hardness of a material and shall be able to evaluate the hardness of the materials using different hardness testing machines. 4. Understand the concept of Impact strength and shall be able to evaluate the impact strength of materials using different impact tests. 5. Understand the concept of energy storage in a helical spring and shall be able to measure the stiffness of the spring on the spring testing machine. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: **MECD3PUP** |
| **Course Name:** Manufacturing Processes-II lab | **Course Code**: MECD2454P |

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| **Course Outcomes:**At the end of this course, the student would be able to:   1. Learn to develop joint of materials such as mild steel, brass etc. using gas welding. 2. Learn to prepare single piece pattern out of wood, along with mould making and casting of aluminium. 3. Develop an understanding of various machining operations such as turning, grinding and drilling. |

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| **Program Name**: Three year diploma (Mechanical Engineering) | **Program Code**: MECD3PUP |
| **Course Name**: Punjabi | **Course Code**: \*\* |
| Course Outcomes: At the end of this course, the student will be able to:   1. To develop a bonding with the mother tongue of the student. 2. Basic knowledge of Punjabi as Language. 3. Students get basic knowledge of the Punjabi grammar. 4. The student gains the knowledge and understanding of literature of Punjabi and Punjabi cultures. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Heat and Mass Transfer | **Course Code**: MECD3501T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Understand the fundamental and advanced concepts of various heat transfer modes, viz, conduction, convection and radiation modes, and the basics of mass transfer. 2. Develop knowledge about heat transfer during phase-change processes, viz. boiling and condensation. 3. Understand the different laws of radiation heat exchange. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Refrigeration and Air Conditioning | **Course Code**: MECD3502T |
| **Course Outcomes:** At the end of this course, the students will be able to:   1. understand the fundamental and advanced concepts of various refrigeration systems like, air refrigeration system, vapour compression refrigeration system and the vapour absorption refrigeration system. 2. develop knowledge about the concept of COP, the refrigeration effect and the power consumption in refrigeration systems. 3. develop knowledge about various refrigerants and the refrigerating equipment, including the concepts of psychrometry and the air-conditioning systems. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Thermodynamics-II | **Course Code**: MECD3503T |
| Course Outcomes: At the end of this course, the students will be able to:  1. Understand operation of SI engines and CI Engines.  2. Design the cooling system for an I.C. Engine.  3. Testing of I.C. engines.  4. Understand the working principle of Steam turbines, Steam condensers, Gas Turbines and Jet Propulsion. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Manufacturing process-III | **Course Code**: MECD3504T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Select different types of the milling processes. 2. Select different types of the grinding processes. 3. Select modern machine for specific purpose.   . | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Computer Aided Design | **Course Code**: MECD3505T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. To understand the basic concepts and in-depth applications of computer aided design in 2D & 3D mechanical design. 2. To perform the 2D & 3D geometric transformations. 3. To understand various 2D, surface & solid models and design basic models in computer aided design. 4. To introduce the utility of various modelling and assembly tools and their basic features. 5. Select modern machine for specific purpose.. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Heat and Mass Transfer Lab | **Course Code**: MECD3551P |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Develop an understanding of the conductive, convective and radiative heat transfer through experiments. 2. Develop an ability to perform heat transfer experiments using standard laboratory equipment. 3. To determine the thermal conductivity of metal rod and composite walls. 4. To determine heat transfer co-efficient by natural and forced convection 5. Understand the concepts of heat exchange between black and non-black bodies. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Refrigeration and Air Conditioning Lab | **Course Code**: MECD3552P |
| **Course Outcomes:** At the end of this course, the students will be able to:   1. Develop practical hands-on experience in finding out the COP of various refrigeration systems, like refrigerator, ice plant etc. 2. Develop practical hands-on in cutting and flaring of tubes and fitting of the refrigeration pipes and fault detection. 3. Develop knowledge about various components used in the refrigeration systems like, thermostatic switches, filters, hermetically sealed compressors. 4. Practically charge the refrigeration and the windows air-conditioner. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Thermodynamics-II Lab | **Course Code**: MECD3553P |
| Course Outcomes: At the end of this course, the students will be able to:  1. Develop an understanding about various components of I.C. and C.I. Engines, viz. cooling, lubrication and fuel-injection systems.  2. Determination of BHP by dynamometer.  3. Perform Morse test on multi-cylinder petrol engine.  4. Develop an understanding about various Steam turbines and Steam condensers. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Manufacturing process-III | **Course Code**: MECD3554P |
| **Course Outcomes:** At the end of this course, the student will be able to inculcate the practical abilities along with theoretical knowledge. Students shall be able to perform:   1. Different types of milling operations. 2. Different types of grinding operation. 3. Different types of turning operation.   . | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Computer Aided Design Lab | **Course Code**: MECD3555P |
| **Course Outcomes:** At the end of this course, the student will be able to inculcate the practical abilities along with theoretical knowledge. Students shall be able to perform:   1. To make students to use the 2D & 3D drawing and editing commands in AutoCAD software. 2. To use AutoCAD for assembly detailing and isometric drawing. 3. To use software tool for geometric transformations. 4. To introduce and use CAD tools such as Pro/E, SolidWorks, Inventor, etc. for 3D modelling.   . | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Metrology and Instrumentation | **Course Code**: MECD3601T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Know the terms of the measurements and understand the principle of operation of an instrument. 2. Choose Suitable measuring instruments for a particular application. 3. Acquire knowledge about surface roughness terminology used. 4. Use instruments for measuring surface roughness parameters. 5. Measure and derive important dimensions of various thread forms and gears. 6. Learn about measurements of various mechanical quantities like Force, Temperature, Pressure, Velocity, Acceleration, Torque etc. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Automobile Engineering | **Course Code**: MECD3602T |
| **Course Outcomes:** At the end of this course, the students will be able to:   1. Understand the different types of automobiles manufactured in India and their classification on different basis. 2. Develop knowledge about the power system, the classification of the IC engines and modern components used in today’s vehicles like MPFI, CRDi etc. 3. Understand various transmission systems, steering systems, raking systems and the suspension systems. The detailed study of all these systems will be made. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** CNC Machines and Automation | **Course Code**: MECD3603T |
| **Course Outcomes:** At the end of this course, the student will be able to:   1. Understand the fundamental concepts of numerical control, CNC and DNC machines. 2. Apply part programming in numerical control machines. 3. Diagnose common problems and remedies in CNC machines. 4. Select the automated systems for different industrial applications. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code:** MECD3PUP |
| **Course Name:** Machine Design | **Course Code:** MECD3604T |
| Course Outcomes: At the end of this course, the student will be able to:   1. Understand the concept of design against static loading for different types of loads and moments and shall be able to determine the dimensions of a part for different types of tensile loads, compressive loads, shearing loads, bending moments, torsional moments and combinations of these. 2. Understand the concept of designing of shafts under different types of loads and for different applications and shall be able to determine the dimensions of the shafts. 3. Understand the concept of design of keys and shall be able to determine the sizes of keys. 4. Understand the concept and shall be able to design different types of temporary fasteners e.g. cotter joint, knuckle joint, spigot and socket joint. 5. Understand the concept and shall be able to design different types of permanent joints like Riveted and Welded Joints. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Metrology and Instrumentation Lab | **Course Code**: MECD3651P |
| **Course Outcomes:** At the end of this course:   1. Demonstrate and use different length measuring instruments like vernier calipers and micrometers 2. Explain and use different angle measuring instrument like universal bevel protractor, sine bar 3. They will be able to select and use the appropriate measuring instrument according to a specific requirement. 4. Learn the types of measurement, errors & their analysis. 5. Evaluate the surface quality of a given specimen which is important in all kind of manufacturing 6. To provide students with the necessary skills to collect data, perform analysis and interpret results to draw valid conclusions through standard test procedures using various metrology instruments 7. The student should be able to comprehend the capability of use of modern measuring tools to analyze the subsystems, processes for a variety of application. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Automobile Engineering Lab. | **Course Code**: MECD3652P |
| **Course Outcomes:** At the end of this course, the students will be able to:   1. Understand the battery and magneto ignition systems used in SI engine vehicles. 2. Practically understand the head light, wiper and the indicator models. 3. Understand the practical working of steering system, axles, turning mechanism. 4. Hands on experience on 4 wheeler driving and changing of wheels and tyre inflation and balancing of wheels. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** CNC Machines and Automation Lab | **Course Code**: MECD3653P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. Develop part programs for linear and circular interpolation in CNC machines. 2. Develop part programs for the milling operations. 3. Prepare work instructions for machine operator. 4. Tool setting of CNC machines. | |

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| **Program Name:** Diploma in Mechanical Engineering | **Program Code**: MECD3PUP |
| **Course Name:** Project Work | **Course Code**: MECD3654P |
| **Course Outcomes:**At the end of this course, the student will be able to:   1. To develop the practical prototypes based on technical learning. 2. To inculcate the ability of problem formulation and suggesting the feasible solution of problem. 3. Discovering ways of improvements in the project by suggesting the innovative ideas. | |