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Mechanical Engineering

Course Outcomes

Second Year Engineering (2019 Pattern)

Course code and Name: 202041 - Solid Mechanics

202041.1	DEFINE various types of stresses and strain developed on determinate and indeterminate members.
202041.2	DRAW Shear force and bending moment diagram for various types of transverse loading and support.
202041.3	COMPUTE the slope & deflection, bending stresses and shear stresses on a beam.
202041.4	CALCULATE torsional shear stress in shaft and buckling on the column.
202041.5	APPLY the concept of principal stresses and theories of failure to determine stresses on a 2-D element.
202041.6	UTILIZE the concepts of SFD & BMD, torsion and principal stresses to solve combined loading application based problems.

Course code and Name: 202042 - Solid Modeling and Drafting

202042.1	UNDERSTAND basic concepts of CAD system, need and scope in Product Lifecycle Management
202042.2	UTILIZE knowledge of curves and surfacing features and methods to create complex solid geometry
202042.3	CONSTRUCT solid models, assemblies using various modeling techniques & PERFORM mass property analysis, including creating and using a coordinate system.
202042.4	APPLY geometric transformations to simple 2D geometries
202042.5	USE CAD model data for various CAD based engineering applications viz. production drawings, 3D printing, FEA, CFD, MBD, CAE, CAM, etc.
202042.6	USE PMI & MBD approach for communication

Course code and Name: 202043 - Engineering Thermodynamics

202043.1	DESCRIBE the basics of thermodynamics with heat and work interactions.
202043.2	APPLY laws of thermodynamics to steady flow and non-flow processes.
202043.3	APPLY entropy, available and non available energy for an Open and Closed System,

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202043.4 DETERMINE the properties of steam and their effect on performance of vapour power cycle.

202043.5 ANALYSE the fuel combustion process and products of combustion.

202043.6 SELECT various instrumentations required for safe and efficient operation of steam generator.

Course code and Name: 202044 - Engineering Materials and Metallurgy

202044.1 COMPARE crystal structures and ASSESS different lattice parameters.

202044.2 CORRELATE crystal structures and imperfections in crystals with mechanical behaviour of materials.

202044.3 DIFFERENTIATE and DETERMINE mechanical properties using destructive and non-destructive testing of materials.

202044.4 IDENTIFY & ESTIMATE different parameters of the system viz., phases, variables, component, grains, grain boundary, and degree of freedom. etc.

202044.5 ANALYSE effect of alloying element & heat treatment on properties of ferrous & nonferrous alloy.

202044.6 SELECT appropriate materials for various applications.

Course code and Name: 203156 - Electrical and Electronics Engineering

203156.1 APPLY programming concepts to UNDERSTAND role of Microprocessor and Microcontroller in embedded systems

203156.2 DEVELOP interfacing of different types of sensors and other hardware devices with Atmega328 based Arduino Board

203156.3 UNDERSTAND the operation of DC motor, its speed control methods and braking

203156.4 DISTINGUISH between types of three phase induction motor and its characteristic features

203156.5 EXPLAIN about emerging technology of Electric Vehicle (EV) and its modular subsystems

203156.6 CHOOSE energy storage devices and electrical drives for EVs

Course code and Name: 202045 - Geometric Dimensioning and Tolerancing Lab

202045.1 SELECT appropriate IS and ASME standards for drawing

202045.2 READ & ANALYSE variety of industrial drawings

202045.3 APPLY geometric and dimensional tolerance, surface finish symbols in drawing

202045.4 EVALUATE dimensional tolerance based on type of fit, etc.

202045.5 SELECT an appropriate manufacturing process using DFM, DFA, etc.

Course code and Name: 207002 - Engineering Mathematics - III

207002.1 SOLVE higher order linear differential equations and its applications to model and analyze mass spring systems.

207002.2 APPLY Integral transform techniques such as Laplace transform and Fourier transform to solve differential equations involved in vibration theory, heat transfer and

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related mechanical engineering applications.

207002.3 APPLY Statistical methods like correlation, regression in analyzing and interpreting experimental data applicable to reliability engineering and probability theory in testing and quality control.

207002.4 PERFORM Vector differentiation & integration, analyze the vector fields and APPLY to fluid flow problems.

207002.5 SOLVE Partial differential equations such as wave equation, one and two dimensional heat flow equations.

Course code and Name: 202047 - Kinematics of Machinery

202047.1 APPLY kinematic analysis to simple mechanisms

202047.2 ANALYZE velocity and acceleration in mechanisms by vector and graphical method

202047.3 SYNTHESIZE a four bar mechanism with analytical and graphical methods

202047.4 APPLY fundamentals of gear theory as a prerequisite for gear design

202047.5 CONSTRUCT cam profile for given follower motion

Course code and Name: 202048 - Applied Thermodynamics

202048.1 DETERMINE COP of refrigeration system and ANALYZE psychometric processes.

202048.2 DISCUSS basics of engine terminology, air standard, fuel air and actual cycles.

202048.3 IDENTIFY factors affecting the combustion performance of SI and CI engines.

202048.4 DETERMINE performance parameters of IC Engines and emission control.

202048.5 EXPLAIN working of various IC Engine systems and use of alternative fuels.

202048.6 CALCULATE performance of single and multi stage reciprocating compressors and DISCUSS rotary positive displacement compressors

Course code and Name: 202049 - Fluid Mechanics

202049.1 DETERMINE various properties of fluid

202049.2 APPLY the laws of fluid statics and concepts of buoyancy

202049.3 IDENTIFY types of fluid flow and terms associated in fluid kinematics

202049.4 APPLY principles of fluid dynamics to laminar flow

202049.5 ESTIMATE friction and minor losses in internal flows and DETERMINE boundary layer formation over an external surface

202049.6 CONSTRUCT mathematical correlation considering dimensionless parameters, also ABLE to predict the performance of prototype using model laws

Course code and Name: 202050 - Manufacturing Processes

202050.1 SELECT appropriate moulding, core making and melting practice and estimate pouring time, solidification rate and DESIGN riser size and location for sand casting process

202050.2 UNDERSTAND mechanism of metal forming techniques and CALCULATE load required for flat rolling

202050.3 DEMONSTRATE press working operations and APPLY the basic principles to

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DESIGN dies and tools for forming and shearing operations

202050.4 CLASSIFY and EXPLAIN different welding processes and EVALUATE welding characteristics

202050.5 DIFFERENTIATE thermoplastics and thermosetting and EXPLAIN polymer processing techniques

202050.6 UNDERSTAND the principle of manufacturing of fibre-reinforce composites and metal matrix composites

Course code and Name: 202051 - Machine Shop

202051.1 PERFORM welding using TIG/ MIG/ Resistance/Gas welding technique

202051.2 MAKE Fibre-reinforced Composites by hand lay-up process or spray lay-up techniques

202051.3 PERFORM cylindrical/surface grinding operation and CALCULATE its machining time

202051.4 DETERMINE number of indexing movements required and acquire skills to PRODUCE a spur gear on a horizontal milling machine

202051.5 PREPARE industry visit report

202051.6 UNDERSTAND procedure of plastic processing

Course code and Name: 202052 - Project Based Learning - II

202052.1 IDENTIFY the real-world problem (possibly of interdisciplinary nature) through a rigorous literature survey and formulate / set relevant aims and objectives.

202052.2 ANALYZE the results and arrive at valid conclusions.

202052.3 PROPOSE a suitable solution based on the fundamentals of mechanical engineering by possibly integration of previously acquired knowledge.

202052.4 CONTRIBUTE to society through proposed solutions by strictly following professional ethics and safety measures.

202052.5 USE of technology in proposed work and demonstrate learning in oral and written form.

202052.6 DEVELOP ability to work as an individual and as a team member.

Third Year Engineering (2019 Pattern)

Course code and Name: 302041 - Numerical and Statistical Methods

302041.1 SOLVE system of equations using direct and iterative numerical methods..

302041.2 ESTIMATE solutions for differential equations using numerical techniques.

302041.3 DEVELOP solution for engineering applications with numerical integration.

302041.4 DESIGN and CREATE a model using a curve fitting and regression analysis.

302041.5 APPLY statistical Technique for quantitative data analysis.

302041.6 DEMONSTRATE the data, using the concepts of probability and linear algebra.

Course code and Name: 302042 - Heat and Mass Transfer

302042.1 ANALYZE & APPLY the modes of heat transfer equations for one dimensional thermal system.

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302042.2 DESIGN a thermal system considering fins, thermal insulation and & Transient heat conduction.

302042.3 EVALUATE the heat transfer rate in natural and forced convection & validate with experimentation results.

302042.4 INTERPRET heat transfer by radiation between objects with simple geometries, for black and grey surfaces.

302042.5 ABILITY to analyze the rate of mass transfer using Fick's Law of Diffusion and understands mass diffusion in different coordinate systems.

302042.6 DESIGN & ANALYSIS of heat transfer equipments and investigation of its performance.

Course code and Name: 302043 - Design of Machine Elements

302043.1 DESIGN AND ANALYZE the cotter and knuckle Joints, levers and components subjected to eccentric loading.

302043.2 DESIGN shafts, keys and couplings under static loading conditions.

302043.3 ANALYZE different stresses in power screws and APPLY those in the procedure to design screw jack.

302043.4 EVALUATE dimensions of machine components under fluctuating loads.

302043.5 EVALUATE & INTERPRET the stress developed on the different type of welded and threaded joints.

302043.6 APPLY the design and development procedure for different types of springs.

Course code and Name: 302044 - Mechatronics

302044.1 DEFINE key elements of mechatronics, principle of sensor and its characteristics.

302044.2 UTILIZE concept of signal processing and MAKE use of interfacing systems such as ADC, DAC, Digital I/O.

302044.3 DETERMINE the transfer function by using block diagram reduction technique.

302044.4 EVALUATE Poles and Zero, frequency domain parameter for mathematical modeling for mechanical system.

302044.5 APPLY the concept of different controller modes to an industrial application.

302044.6 DEVELOP the ladder programming for industrial application.

Course code and Name: 302045 A Elective-I - Advanced Forming & Joining Processes

302045A.1 ANALYSE the effect of friction in metal forming deep drawing and IDENTIFICATION of surface defects and their remedies in deep drawing operations

302045A.2 ASSESS the parameters for special forming operation and SELECT appropriate special forming operation for particular applications

302045A.3 ANALYSE the effect of HAZ on microstructure and mechanical properties of materials

302045A.4 CLASSIFY various solid state welding process and SELECT suitable welding processes for particular applications.

302045A.5 CLASSIFY various advanced welding process and SELECT suitable welding

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processes for particular applications.

302045A.6 INTERPRET the principles of sustainable manufacturing and its role in manufacturing industry.

Course code and Name: 302045-B Elective-I - Machining Science &Technology

302045B.1 DEFINE metal cutting principles and mechanics of metal cutting and tool life.

302045B.2 DESCRIBE features of gear and thread manufacturing processes.

302045B.3 SELECT appropriate grinding wheel and demonstrate the various surface finishing processes.

302045B.4 SELECT appropriate jigs/fixtures and to draw the process plan for a given component.

302045B.5 SELECT & EVALUATE various parameters of process planning.

302045B.6 GENERATE CNC program for Turning / Milling processes and generate tool path using CAM software.

Course code and Name: 302046 - Digital Manufacturing Laboratory

302046.1 DEVELOP a component using conventional machines, CNC machines and Additive Manufacturing Techniques.

302046.2 ANALYZE cutting tool parameters for machining given job.

302046.3 DEMONSTRATE simulation of manufacturing process using Digital Manufacturing Tools.

302046.4 SELECT and DESIGN jigs and Fixtures for a given component.

302046.5 DEMONESTRATE different parameters for CNC retrofitting and reconditioning.

Course code and Name: 302047 - Skill Development

302047.1 APPLY& DEMONSTRATE procedure of assembly & disassembly of various machines.

302047.2 DESIGN & DEVELOP a working/model of machine parts or any new product.

302047.3 EVALUATE fault with diagnosis on the machines, machine tools and home appliances.

302047.4 IDENTIFY & DEMONSTRATE the various activities performed in an industry such as maintenance, design of components, material selection.

Course code and Name: 302049 - Artificial Intelligence & Machine Learning

302049.1 DEMONSTRATE fundamentals of artificial intelligence and machine learning.

302049.2 APPLY feature extraction and selection techniques.

302049.3 APPLY machine learning algorithms for classification and regression problems.

302049.4 DEVISE AND DEVELOP a machine learning model using various steps.

302049.5 EXPLAIN concepts of reinforced and deep learning.

302049.6 SIMULATE machine learning model in mechanical engineering problems.

Course code and Name: 302050 - Computer Aided Engineering

302050.1 DEFINE the use of CAE tools and DESCRIBE the significance of shape functions

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in finite element formulations.

302050.2 APPLY the various meshing techniques for better evaluation of approximate results.

302050.3 APPLY material properties and boundary condition to SOLVE 1-D and 2-D element stiffness matrices to obtain nodal or elemental solution.

302050.4 ANALYZE and APPLY various numerical methods for different types of analysis.

302050.5 EVALUATE and SOLVE non-linear and dynamic analysis problems by analyzing the results obtained from analytical and computational method.

302050.6 GENERATE the results in the form of contour plot by the USE of CAE tools.

Course code and Name: 302051 - Design of Transmission Systems

302051.1 APPLY the principle of Spur & Helical gear design for industrial application and PREPARE a manufacturing drawing with the concepts of GD&T.

302051.2 EXPLAIN and DESIGN Bevel & Worm gear considering design parameters as per design standards.

302051.3 SELECT&DESIGN Rolling and Sliding Contact Bearings from manufacturer's catalogue for a typical application considering suitable design parameters.

302051.4 DEFINE and DESIGN various types of Clutches, Brakes, used in automobile.

302051.5 APPLY various concept to DESIGN Machine Tool Gear box, for different applications

302051.6 ELABORATE various modes of operation, degree of hybridization and allied terms associated with hybrid electric vehicles.

Course code and Name: 302052-A Elective-II - Composite Materials

302052A.1 DEFINE & COMPARE composites with traditional materials.

302052A.2 IDENTIFY & ESTIMATE different parameters of the Polymer Matrix Composite

302052A.3 CATEGORISE and APPLY Metal Matrix Process from possessions landscape.

302052A.4 DETERMINE volume/weight fraction and strength of Composites.

302052A.5 SELECT appropriate testing and inspection method for composite materials.

302052A.6 SELECT composites materials for various applications.

Course code and Name: 302052-B Elective-II - Surface Engineering

302052B.1 DEFINE the basic's principle & mechanism of surface degradation.

302052B.2 ANALYSE & SELECT correct corrosion prevention techniques for a different service condition.

302052B.3 DEMONSTRATE the role of surface engineering of materials to modify/improve the surface properties.

302052B.4 SELECT the suitable surface heat treatments to improve the surface properties.

302052B.5 APPLY the surface modification technique to modify surface properties.

302052B.6 ANALYSE & EVALUTE various surface coating defects using various testing/characterization method.

Course code and Name: 302053 - Measurement Laboratory

302053.1 EVALUATE causes of errors in Vernier calipers, micrometers by performing

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experiments in standard metrological conditions, noting deviations at actual and by plotting cause and effect diagram, to reduce uncertainty in measurement.

302053.2 ANALYZE strain measurement parameters by taking modulus of elasticity in consideration to acknowledge its usage in failure detection and force variations.

302053.3 EXAMINE surface Textures, surface finish using equipment's like Talysurf and analyze surface finish requirements of metrological equipment's like gauges, jaws of vernier calipers, micrometers, magnifying glasses of height gauge and more, to optimize surface finish accuracy requirements and cost of measurement.

302053.4 MEASURE the dimensional accuracy using Comparator and limit gauges and appraise their usage in actual measurement or comparison with standards set to reduce measurement lead time.

302053.5 PERFORM Testing of Flow rate, speed and temperature measurements and their effect on performance in machines and mechanisms like hydraulic or pneumatic trainers, lathe machine etc. to increase repeatability and reproducibility.

302053.6 COMPILE the information of opportunities of entrepreneurships/business in various sectors of metrology like calibrations, testing, coordinate and laser metrology etc in an industry visit report.

Course code and Name: 302054 - Fluid Power & Control Laboratory

302054.1 DEFINE working principle of components used in hydraulic and pneumatic systems.

302054.2 IDENTIFY & EXPLAIN various applications of hydraulic and pneumatic systems.

302054.3 SELECT an appropriate component required for hydraulic and pneumatic systems using manufactures' catalogues.

302054.4 SIMULATE & ANALYSE various hydraulic and pneumatic systems for industrial/mobile applications.

302054.5 DESIGN a hydraulic and pneumatic system for the industrial applications.

302054.6 DESIGN & DEMONESTRATE various IoT, PLC based controlling system using hydraulics and pneumatics.

Course code and Name: 302055 - Internship/Mini project

302055.1 DEMONSTRATE professional competence through industry internship.

302055.2 APPLY knowledge gained through internships to complete academic activities in a professional manner.

302055.3 CHOOSE appropriate technology and tools to solve given problem.

302055.4 DEMONSTRATE abilities of a responsible professional and use ethical practices in day to day life.

302055.5 DEVELOP network and social circle, and DEVELOPING relationships with industry people.

302055.6 ANALYZE various career opportunities and DECIDE career goals.

Fourth Year Engineering (2015 Pattern)

Course code and Name: 402041 - Hydraulics and Pneumatics

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402041.1	Understand working principle of components used in hydraulic & pneumatic systems
402041.2	Identify various applications of hydraulic & pneumatic systems
402041.3	Selection of appropriate components required for hydraulic and pneumatic systems
402041.4	Analyse hydraulic and pneumatic systems for industrial/mobile applications
402041.5	Design a system according to the requirements
402041.6	Develop and apply knowledge to various applications

Course code and Name: 402042 - CAD CAM and Automation

402042.1	Apply homogeneous transformation matrix for geometrical transformations of 2D CAD entities for basic geometric transformations.
402042.2	Use analytical and synthetic curves and surfaces in part modeling.
402042.3	Do real times analysis of simple mechanical elements like beams, trusses, etc. and comment on safety of engineering components using analysis software.
402042.4	Generate CNC program for Turning / Milling and generate tool path using CAM software.
402042.5	Demonstrate understanding of various rapid manufacturing techniques and develop competency in designing and developing products using rapid manufacturing technology.
402042.6	Understand the robot systems and their applications in manufacturing industries.

Course code and Name: 402043 - Dynamics of Machinery

402043.1	Apply balancing technique for static and dynamic balancing of multi cylinder inline and radial engines.
402043.2	Estimate natural frequency for single DOF undamped & damped free vibratory systems.
402043.3	Determine response to forced vibrations due to harmonic excitation, base excitation and excitation due to unbalance forces.
402043.4	Estimate natural frequencies, mode shapes for 2 DOF undamped free longitudinal and torsional vibratory systems.
402043.5	Describe vibration measuring instruments for industrial / real life applications along with suitable method for vibration control.
402043.6	Explain noise, its measurement & noise reduction techniques for industry and day today life problems.

Course code and Name: 402044 A Elective-I - Finite Element Analysis

402044A.1	Understand the different techniques used to solve mechanical engineering problems.
402044A.2	Derive and use 1-D and 2-D element stiffness matrices and load vectors from various methods to solve for displacements and stresses.
402044A.3	Apply mechanics of materials and machine design topics to provide preliminary results used for testing the reasonableness of finite element results.
402044A.4	Explain the inner workings of a finite element code for linear stress, displacement,

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temperature and modal analysis.

402044A.5 Use commercial finite element analysis software to solve complex problems in solid mechanics and heat transfer.

402044A.6 Interpret the results of finite element analyses and make an assessment of the results in terms of modeling (physics assumptions) errors, discretization (mesh density and refinement toward convergence) errors, and numerical (round-off) errors.

Course code and Name: 402044 B Elective-I - Computational Fluid Dynamics

402044B.1 Analyze and model fluid flow and heat transfer problems.

402044B.2 Generate high quality grids and interpret the correctness of numerical results with physics.

402044B.3 Conceptualize the programming skills.

402044B.4 Use a CFD tool effectively for practical problems and research.

Course code and Name: 402044 C Elective-I - Heating, Ventilation, Air Conditioning and Refrigeration Engineering

402044C.1 Determine the performance parameters of trans-critical & ejector refrigeration systems

402044C.2 Estimate thermal performance of compressor, evaporator, condenser and cooling tower.

402044C.3 Describe refrigerant piping design, capacity & safety controls and balancing of vapour compressor system.

402044C.4 Explain importance of indoor and outdoor design conditions, IAQ, ventilation and air distribution system.

402044C.5 Estimate heat transmission through building walls using CLTD and decrement factor &time lag methods with energy-efficient and cost-effective measures for building envelope.

402044C.6 Explain working of types of desiccant, evaporative, thermal storage, radiant cooling, clean room and heat pump air-conditioning systems.

Course code and Name: 402045 A Elective-II - Automobile Engineering

402045A.1 To compare and select the proper automotive system for the vehicle.

402045A.2 To analyse the performance of the vehicle.

402045A.3 To diagnose the faults of automobile vehicles.

402045A.4 To apply the knowledge of EVs, HEVs and solar vehicles

Course code and Name: 402045 B Elective-II - Operation Research

402045B.1 Apply LPP and Decision Theory to solve the problems

402045B.2 Apply the concept of transportation models to optimize available resources.

402045B.3 Decide optimal strategies in conflicting situations.

402045B.4 Implement the project management techniques.

402045B.5 Minimize the process time

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402045B.6 Optimize multi stage decision making problems

Course code and Name: 402045 C Elective-II - Energy Audit and Management

402045C.1 Compare energy scenario of India and World.
402045C.2 Carry out Energy Audit of the Residence / Institute/ Organization.
402045C.3 Evaluate the project using financial techniques
402045C.4 Identify and evaluate energy conservation opportunities in Thermal Utilities.
402045C.5 Identify and evaluate energy conservation opportunities in Electrical Utilities.
402045C.6 Identify the feasibility of Cogeneration and WHRUse a CFD tool effectively for practical problems and research.

Course code and Name: 402046 - Project – I

402046.1 Find out the gap between existing mechanical systems and develop new creative new mechanical system.
402046.2 Learn about the literature review
402046.3 Get the experience to handle various tools, tackles and machines.

Course code and Name: 402047 - Energy Engineering

402047.1 Describe the power generation scenario, the layout components of thermal power plant and analyze the improved Rankin cycle, Cogeneration cycle
402047.2 Analyze the steam condensers, recognize the an environmental impacts of thermal power plant and method to control the same
402047.3 Recognize the layout, component details of hydroelectric power plant and nuclear power plant
402047.4 Realize the details of diesel power plant, gas power plant and analyze gas turbine power cycle
402047.5 Emphasize the fundaments of non-conventional power plants
402047.6 Describe the different power plant electrical instruments and basic principles of economics of power generation.

Course code and Name: 402048 - Mechanical System Design

402048.1 Understand the difference between component level design and system level design.
402048.2 Design various mechanical systems like pressure vessels, machine tool gear boxes, material handling systems, etc. for the specifications stated/formulated.
402048.3 Learn optimum design principles and apply it to mechanical components.
402048.4 Handle system level projects from concept to product.

Course code and Name: 402049 A Elective–III - Tribology

402049A.1 The course will enable the students to know the importance of Tribology in Industry.
402049A.2 The course will enable the students to know the basic concepts of Friction, Wear, Lubrications and their measurements.

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402049A.3 This course will help students to know the performance of different types of bearings and analytical analysis thereof.

402049A.4 This course will help students to apply the principles of surface engineering for different applications of tribology.

Course code and Name: 402049 B Elective–III - Industrial Engineering

402049B.1 Apply the Industrial Engineering concept

402049B.2 Understand, analyze and implement different concepts involved in method study.

402049B.3 Design and Develop different aspects of work system and facilities.

402049B.4 Understand and Apply Industrial safety standards, financial management practices.

402049B.5 Undertake project work based on modeling & simulation area.

Course code and Name: 402049 C Elective–III - Robotics

402049C.1 Identify different type of robot configuration with relevant terminology.

402049C.2 Select suitable sensors, actuators and drives for robotic systems.

402049C.3 Understand kinematics in robotic systems.

402049C.4 Design robot with desired motion with suitable trajectory planning.

402049C.5 Select appropriate robot programming for given application.

402049C.6 Understand need of IoT, machine learning, simulation in robotics.

Course code and Name: 402050 A Elective–IV - Advanced Manufacturing Processes

402050A.1 Classify and analyze special forming processes

402050A.2 Analyze and identify applicability of advanced joining processes

402050A.3 Understand and analyze the basic mechanisms of hybrid non-conventional machining techniques

402050A.4 Select appropriate micro and nano fabrication techniques for engineering applications

402050A.5 Understand and apply various additive manufacturing technology for product development

402050A.6 Understand material characterization techniques to analyze effects of chemical composition, composition variation, crystal structure, etc.

Course code and Name: 402050 B Elective–IV - Solar and Wind Energy

402050B.1 Design of solar food drier for domestic purpose referring existing system

402050B.2 Design of parabolic dish solar cooker for domestic purpose referring existing system

402050B.3 Design of solar photovoltaic system for domestic purpose referring existing system

402050B.4 Design miniature wind mill for domestic purpose referring existing system

Course code and Name: 402050 C Elective–IV - Product Design and Development

402050C.1 Understand essential factors for product design

402050C.2 Design product as per customer needs and satisfaction

402050C.3 Understand Processes and concepts during product development

402050C.4 Understand methods and processes of Forward and Reverse engineering

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402050C.5 Carry various design processes as DFA, DFMEA, design for safety

402050C.6 Understand the product life cycle and product data management

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