

DEPARTMENT OF MECHANICAL ENGINEERING

Program outcomes Detail

Sr. No.	Academic contents	Types of contents	Outcomes
1.	Program outcome	B. Tech	<ol style="list-style-type: none">1. An ability to apply knowledge of mathematics, science and engineering in practice2. An ability to identify, critically analyze, formulate and solve engineering problems3. An ability to select appropriate engineering tools and techniques and use them with dexterity4. An ability to design a system and process to meet desired needs within realistic constraints such as health, safety, security and manufacturability5. An ability to devise and conduct experiments, interpret data and provide well informed conclusions6. An ability to understand the impact of engineering solutions within purview of laws, in a contemporary, global, economical, environmental, and societal context for sustainable development7. An ability to function professionally with ethical response ability as an individual as well as in multidisciplinary teams with positive attitude8. An ability to communicate effectively9. An ability to appreciate the importance of goal setting and to recognize the need for life-long learning10. To produce well informed socially responsible global citizen with sharp critical thinking skills having sound awareness about finance management, engineering laws and human rights, ethics and values. They will have entrepreneurial spirit.

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2.	<u>Program Specific outcomes</u>	B. Tech. (ME)	<p>Each student will attain at least the following specific outcomes from this B. tech degree course:</p> <p><u>1. Proper scientific and technical knowledge</u> Graduates shall make their way to the society with proper scientific and technical knowledge in mechanical engineering.</p> <p><u>2. Strong fundamentals</u> Graduates shall work in design and analysis of mechanical systems with strong fundamentals and methods of synthesis.</p> <p><u>3. Ability of Designing and developing mechanical components</u> Ability to design and develop mechanical components and processes to meet desired needs considering public health, safety, cultural, social, and environmental aspects.</p> <p><u>4. Ability of understanding</u> Ability to understand and investigate complex mechanical engineering problems experimentally</p> <p><u>5. Ability of applications</u> Ability to apply modern engineering tools, techniques and resources to solve complex mechanical engineering activities with an understanding of the limitations.</p> <p><u>6. Ability of analyzing and understanding</u> Ability to understand the effect of mechanical engineering solutions on legal, cultural, social, public health and safety aspects.</p> <p><u>7. Capability of sustainable solutions</u> Capable of developing sustainable solutions and create their long lasting effect on society and environment</p> <p><u>8. Capability of ethical principles</u> Capable to apply ethical principles to engineering practices and professional responsibilities.</p> <p><u>9. Capability of reporting</u> Capable to comprehend, design documentation, write effective reports, make effective presentations to the engineering community and society at large.</p> <p><u>10. Adoption of rapid changes</u> Graduates shall adapt to the rapidly changing environment in the areas of mechanical engineering</p>
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			<p>Undertake project in emerging areas to function effectively as an individual, and as a member or leader in diverse teams. Adequate knowledge and exposure to industry standard software and hardware to lead professional carrier in Electronics & Communication</p> <p>22. <u>Strong Communication:</u> Communicate effectively with diverse audiences and able to write/present effective reports and design technical documentation. Ability to communicate effectively and execute the work as a team.</p> <p>23. <u>Tendency of Life-long learning:</u> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.</p> <p>24. <u>An ability to build the nation,</u> By imparting technological inputs and managerial skills to become Technocrats and Entrepreneurs, build the attitude of developing new concepts on emerging fields and pursuing advanced education</p>
BOS	Dated 09/05/2020	B. Tech. (ME) (specialization in Manufacturing technology)	<p>1. <u>Knowledge of contemporary issues</u> By imparting specialization in manufacturing technology it shall create the understanding of the impact of engineering/technical solutions within a global perspective.</p> <p>2. <u>Ability to design a system, component or process to meet desired needs.</u> It will develop a knowledge to design a system or components</p> <p>3: <u>Application of engineering</u> Application of engineering and technological knowledge to solve a wide range of manufacturing and Industrial problems.</p> <p>4: <u>Developing expertise</u> Developing expertise in automation related subjects both at the theory and practical level.</p> <p>5: <u>Developing the ability</u> Developing the ability and expertise in the students to apply latest data analytics tools and techniques for computing and engineering practice.</p>

		MEL0240 Manufacturing Technology-I (1stsemester) Credits (3-0-2)	CO1 Introduction of manufacturing processes CO2 Casting Processes CO3 Basic Joining Processes CO4 Special Welding Processes CO5 Design of Weldments 3Theory period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		MEL 0311 Manufacturing Technology II 3rd Semester Credits (3-0-2)	CO1 Metal Forming CO2 Forging and rolling CO3 Extrusion and Drawing CO4 Sheet metal forming CO5 Powder Metallurgy 3Theory period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		<u>MEL 0310</u> Mechanics of Solid Credits (3-1-2)	CO1Understanding Stress and strain; normal, shear and bearing stresses; CO2Understanding Strain energy CO3Understanding State of stress, Generalized Hook's Law, stress transformation CO4Understanding Mohr's Circle representation for stress and strains CO5Understanding Bending of beams, Understanding Torsion of Shafts, Understanding Pressure Vessels: 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester

		<p>MEL 0442 Machining Processes 4th Semester Credits (3-1-2)</p>	<p>CO1 Metal Cutting CO2 Cutting Tools, Cutting Tool Materials: CO3 Machine Tools Lathe, Milling Machine CO4 Drilling Machine, Boring Machine CO5 Grinding Machines: Broaching Machine 3Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester</p>
		<p>MEL 0407 Fluid Mechanics (3-1-2)5</p>	<p>CO1 Definitions, Types, Properties of Fluid, Fluid Statics CO2 Kinematics and conservation of Mass: CO1 The Boundary Layer CO1 Flow Through Pipes: Reynold's experiment CO1 Laminar Flow, Turbulent Flow, Dimensional Analysis: 3Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester</p>

Course outcome
B.Tech /B.TECH(Hons.)

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3.	Course outcome	<u>1.MEL0202</u> Engineering Graphics (2ndsemester) Credits (2-1-2)4	CO1 Draw orthographic projections of lines, planes and solids. CO2 Construct isometric scale, isometric projections and views CO3 Draw sections of solids including cylinders, cones, prisms and pyramids CO4 Draw projections of lines, planes, solids, isometric projections and sections of solids CO5 Draw projections OF cylinders, cones, prisms and pyramids using Auto CAD 2 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		<u>2. MEL0101</u> Engineering Mechanics (1st semester) Credits (3-1-2)5	CO1Determine the resultant force and moment for a given force system. Analyze planar and spatial systems to determine the forces in members of trusses, frames and problems related to friction. CO2Calculate the motion parameters for a body subjected to a given force system. CO3Determine the deformation of a shaft and understand the relationship between material constants CO4Determine the centroid and second moment of area CO5Determine the power transmission in belts 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		<u>3.MEP 0101</u> Mechanical Workshop (1st semester) Credits (0-0-2)1	CO1Study and practice on machine tools and their operations CO2Practice on manufacturing of components using workshop trades including fitting carpentry, foundry and welding CO3Identify and apply suitable tools for machining processes including turning, facing thread cutting and tapping 2 Practical period of Fifty minutes per week over a semester
		<u>4.MEL 0304</u> Material Science (3rd semester)	CO1Understand the crystal structure and classification of materials CO2Understand mechanical properties and their applications CO3Classify cast irons and study their applications

		Credits (3-0-0)3	CO4Interpret the phase diagrams of materials. CO5Select suitable heat-treatment process to achieve desired CO6properties of metals and alloys. CO7various types of materials that are used in engineering with special emphasis on steel/ferrous materials 3 Theory period of Fifty minutes per week over a semester
		<u>5.MEL 0305</u> Basic Thermodynamics (3rd semester) Credits (3-1-2)5	CO1Understand the concepts of continuum, system, control volume, thermodynamic properties, thermodynamic equilibrium, work and heat CO2Apply the laws of thermodynamics to analyze boilers, heat pumps, refrigerators, heat engines, compressors and nozzles. CO3Evaluate the available energy and irreversibility. CO4Evaluate properties of pure substances and gas mixtures CO5Analyze air standard cycles applied in prime movers CO6Understand the heat transfer, energy conversion, Refrigeration & air conditioning, and I.C. Engines 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		<u>6.MEL 0307</u> Fluid Mechanics (3rd semester) Credits (3-1-2)5	CO1Apply conservation laws to fluid flow problems in engineering applications. CO2Design experimental investigations for properties of fluids CO3Compute drag and lift coefficients using the theory of boundary layer flows CO4Analyze and design free surface and pipe flows CO5Formulate and solve one dimensional compressible fluid flow problems 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		<u>7.MEL 0308</u> Measurement and metrology (3rd semester) Credits (3-1-2)5	CO1understand the principles of metrology and measurements CO2understand the methods of measurement CO3understand the applications of measurement CO4role of metrology and measurements in industry CO5analyze the errors in measurement CO6 solve problems in measurements

			<p>3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>8.MEL 0303</u> Basics of Mechanical Engineering (3rd semester civil) Credits (3-1-2)5</p>	<p>CO1 understand the basics of Mechanical Engineering in the areas of Materials, Measurements, manufacturing processes and Power cycles CO2 it is quite useful to the students of Civil Engineering discipline</p> <p>3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>9 MEP 0302</u> Machine Drawing (3rd semester) Credits (0-0-4)2</p>	<p>CO1 To have the knowledge of drawing practices for common machine elements, and assembly drawings. CO2 Understanding Drawing of Fasteners CO3 Understanding Assembly drawing of IC engine parts: CO4 Understanding Assembly drawing of machine tool parts: CO5 Understanding Assembly drawing of boiler mountings: CO6 Understanding Computer aided drafting: 4 Practical period of Fifty minutes per week over a semester</p>
		<p><u>10.MEL 0412</u> Manufacturing Processes I (4th semester) Credits (3-0-2)4</p> <p><u>11.MEL 0409</u> Industrial Engineering & Management (4th semester) Credits (3-0-0)3</p>	<p>CO1 Understanding various manufacturing operations. CO2 Understanding process of Metal Forming Processes CO3 Understanding Welding - Basic Joining Processes CO4 Understanding Unconventional Metal Forming Process CO5 Understanding uses of Jigs and Fixtures CO6 Understanding Casting: 3 Theory period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester CO1 capable of successfully production planning, controlling CO2 capable of implementing large-scale projects. CO3 capable of design, improvement, installation, and CO4 management of capable of integrated systems of people, material, and equipment. CO5 Understanding Productivity & Work Study: CO6 Understanding Method Study CO7 understanding Work Measurement:</p>

			3 Theory period of Fifty minutes per week over a semester
		<p><u>12.MEL 0410</u> Mechanics of Solid (4th semester)</p> <p>Credits (3-1-2)5</p>	<p>CO1 Understanding Stress and strain; normal, shear and bearing stresses; CO2 Understanding Strain energy CO3 Understanding State of stress, Generalized Hook's Law, stress transformation CO4 Understanding Mohr's Circle representation for stress and strains CO5 Understanding Bending of beams: CO6 Understanding Torsion of Shafts CO7 Understanding Pressure Vessels:</p> <p>3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>13.MEL0411</u> Energy Conversion System (4th semester)</p> <p>Credits (3-1-2)5</p>	<p>CO1 Understanding Thermodynamic Coordinates, Exact differentials CO2 Understanding Boilers: Definition, Classification, working of fire tube and water tube Boilers CO3 Understanding Steam nozzles: Flow through nozzles, variation of velocity, area and specific volume, CO4 Understanding Introduction of steam engines, Classification, Impulse and reaction turbine CO5 Understanding Gas turbines classification, Brayton cycle, principles of gas turbine, gas turbine cycles with intercooling</p> <p>3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>14.MEL0513</u> Manufacturing Process II (5th semester)</p> <p>Credits (3-1-2)5</p>	<p>CO1 Understanding Economics of machines, introduction to machining processes CO2 Understanding Types, geometry of single point cutting tool, twist drill and milling cutter, tool signature. CO3 Understanding Classification, description and operations, kinematic scheme of lathe CO4 Understanding Classification, description and operations. Speed, feed and machine time calculations. CO5 Understanding Broaching Machine: Classification, description and operations</p> <p>3 Theory period of Fifty minutes per week over a semester</p>

			<p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>15.MEL0514</u> Kinematics Of Machines (5th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1Understanding Introduction to planar, spherical and special mechanisms</p> <p>CO2Understanding Velocity definition, rigid body rotation, velocity difference between points of rigid body</p> <p>CO3Understanding Definition, types of acceleration, acceleration difference between points on a rigid body</p> <p>CO4Understanding Introduction, classification of cams and followers</p> <p>CO5Understanding Terminology and definitions, law of gearing, Involute properties, Gear tooth standards for interchangeable gears</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p>
		<p><u>16.MEL0515</u> Machine Design – I (5th semester)</p> <p>Credits (3-1-2)5</p>	<p>CO1Understanding Design process, Requirement for mechanical and other properties</p> <p>CO2Understanding Stress concentration and its effect on ductile and brittle materials</p> <p>CO3Understanding Riveting methods, comparison of riveted joints with other joining methods, rivet materials</p> <p>CO4Understanding Design of welded joints, butt welds, fillet welds-transverse and parallel fillet</p> <p>CO5Understanding Cause of failure in shaft, materials for shaft, stress in shaft</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>17.MEL 0516</u> IC Engines (5th semester)</p>	<p>CO1Understanding Definition of engine; classification, Application of IC Engines</p> <p>CO2Understanding Introduction to fuel air cycles and their significance, composition of cylinder gases</p> <p>CO3Understanding Fuels for SI and CI engine, Important qualities of SI and CI engines</p> <p>CO4Understanding Fuel supply system and fuel pumps, properties of air fuel mixture</p> <p>CO5Understanding Measurement of shaft power, indicated power, measurement of speed, air consumption</p>

		Credits (3-1-2)5	3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		<u>18.MEL 0521</u> Fluid Machinery (5th semester) Credits (3-1-2)5	CO1 Understanding Eulers turbomachinery equation, Specific speed, impulse and reaction principle CO2 Understanding Components and operation; velocity triangles, work output CO3 Understanding Components and operation, velocity triangles and work output CO4 Understanding Main elements and their functions; Various types and classification CO5 Understanding Components, working principle; pressure variations due to piston acceleration 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
B. Tech (Hons) 5th Semester Elective 1	<u>19.MEH 0501</u> Production and Operation Management (5th semester) Credits (4-0-0)4	CO1 Understanding Introduction, systems concept, decisions, organization, objectives CO2 Understanding Plant location, plant layout and material handling, layout analysis CO3 Understanding Strategies of aggregate planning, graphic and charting methods, application of LP CO4 Understanding Types of maintenance strategies, breakdown CO5 Understanding As part of supply chain, purchasing, stores and vendor selection, inventory models, selective inventory control 4 Theory period of Fifty minutes per week over a semester	
B. Tech (Hons). 5th Semester Elective 2	<u>20.MEH 0503</u> Advanced Synthesis of Mechanism (5th semester) Credits (3-1-0)4	CO1 Understanding Mechanisms, Classifications, Relative & absolute motion, degree of freedom CO2 Understanding Type, number and dimensional synthesis, spacing of accuracy points CO3 Understanding Poles and relative poles of four bar linkage CO4 Understanding Displacement equation of four bar linkage, Crank and follower CO5 Understanding Synthesis of slider crank mechanism with three accuracy points	

			<p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p>
		<p><u>21.MEL 0617</u> Machine Design-II (6th semester)</p> <p>Credits (3-1-2)5</p>	<p>CO1 Understanding Classification of gears, standard gear tooth system, nomenclature for spur</p> <p>CO2 Understanding Types of lubrication-hydro dynamic, hydro static and EHD lubrication, plain journal bearing</p> <p>CO3 Understanding General design considerations, design of cylinder and cylinder head, piston, connecting rod and crank shaft</p> <p>CO4 Understanding Friction clutches and brakes, uniform pressure and uniform wear assumptions</p> <p>CO5 Understanding band type clutches and brakes, centrifugal clutches</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>22.MEL 0618</u> Dynamics Of Machines (6th semester)</p> <p>Credits (3-1-2)5</p>	<p>CO1 Understanding D'Alemberts principle, inertia force and inertia torque, equivalent dynamical system,</p> <p>CO2 Understanding Turning moment diagram for single cylinder double acting steam engine, fluctuation of energy</p> <p>CO3 Understanding Introduction, Types of governors, terms used in governors, analysis of watt governor, porter governor</p> <p>CO4 Understanding Introduction, balancing of rotating masses: balancing of a single rotating mass by a single mass rotating in the same plane</p> <p>CO5 Understanding Introduction: Types of free vibrations, natural frequency of free longitudinal ,free transverse vibrations and torsional vibrations</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>23.MEL 0619</u> Heat And Mass Transfer (6th semester)</p>	<p>CO1 Understanding Mechanism of Heat Transfer, Conduction, Convection and Radiation, General Differential equation of Heat Conduction</p> <p>CO2 Understanding Convective Heat Transfer Coefficients, Boundary Layer Concept, Types of Convection, Forced Convection</p>

		<p>Credits (3-1-2)5</p>	<p>CO3 Understanding Laws of Radiation, Stefan Boltzman Law, Kirchoff Law</p> <p>CO4 Understanding Diffusion Mass Transfer, Fick's Law of Diffusion, Steady state Molecular Diffusion, Convective Mass Transfer, Momentum</p> <p>CO5 Understanding Nusselts theory of condensation, pool boiling, flow boiling, correlations in boiling</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 Practical period of Fifty minutes per week over a semester</p>
		<p><u>24.MEL 0620</u> Power Plant Engineering (6th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 Understanding Layout of Steam, Hydel, Diesel, MHD</p> <p>CO2 Understanding Fuel and Ash Handling, Combustion Equipment for burning coal, Mechanical Stokers, Pulveriser, Electrostatic Precipitator</p> <p>CO3 Understanding Nuclear Energy, Fission, Fusion Reaction, Types of Reactors, pressurized water reactor</p> <p>CO4 Understanding Types of Diesel Plants, Components, Selection of Engine Type, Applications Gas Turbine Power Plant, Fuels</p> <p>CO5 Understanding Geo thermal, Tidel, Pumped storage, Solar thermal central receiver system.</p> <p>Cost of Electric Energy</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p>
		<p><u>25.MEL0624</u> Modern Production Processes (6th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 Understanding Limitations of conventional manufacturing processes, Need and classification of unconventional or advanced manufacturing processes</p> <p>CO2 Understanding Metal mould casting, Continuous Casting, Squeeze casting</p> <p>CO3 Understanding Details of electron beam welding (EBW), laser beam welding (LBW)</p> <p>CO4 Understanding Details of high energy rate forming (HERF) process, electro- magnetic forming</p> <p>CO5 Understanding Need, classification, process principle and applications of Abrasive Flow Finishing</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p>

	B. Tech (Hons) 6th Semester Elective 1	<u>26.MEH 0604</u> Advanced Materials Technology (6th semester) Credits (3-1-0)4	CO1Understanding Plain carbon steels, their properties and application: plain carbon steels, effects of alloying elements in plain carbon steels CO2Understanding TTT diagrams, annealing, normalizing, hardening and tempering of steel. Austempering and martempering of steel CO3Understanding Ultra light materials. Properties and application, brasses, bronzes CO4Understanding Classes and application of materials in medicine and dentistry. Stress strain behavior of bone. The mechanical properties including elasticity CO5Understanding Introduction to nuclear materials. Materials for nuclear fuel in fission and fusion reactors, Fissile and fertile materials 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
	B. Tech (Hons) 6th Semester Elective 2	<u>27.MEH 0605</u> Applied Thermodynamics (6th semester) Credits (4-0-0)4	CO1Understanding Definition, basic concepts, zeroth law, real and ideal gases ,reversible and irreversible process, first law applied to flow and non flow processes CO2Understanding Combustion analysis, heating values, air requirement, Air/Fuel ratio CO3Understanding Introduction, law of mass action, criterion for equilibrium, equilibrium constants, degree of reaction, heat of reaction CO4Understanding Introduction to the principles of jet propulsion CO5Understanding General classification, comparison of reciprocating and rotary compressors 4Theory period of Fifty minutes per week over a semester
	B. Tech (Hons) 6th Semester Elective 3	<u>28.MEH 0606</u> Total Quality Management (6th semester)	CO1Understanding place of quality control in industries, quality control organization, difference between inspection and quality control CO2Understanding Sample size and frequency of sampling, Statistical Process Control CO3Understanding Single sampling planes, double sampling& sequential sampling planes, rectifying inspection for lots CO4Understanding Distributions encountered in controlling reliability mean time to failure , exponential failure density

		Credits (3-1-0)4	CO5Understanding6 – Sigma Quality, Introduction to Quality Function Deployment (QFD) and Taguchi Methods 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
		<u>29 MED0601</u> Minor Project (6th semester) Credits (0-0-4)2	CO1to know about the mechanical industry and its overall structure. CO2 to provide a study of the market CO3 to provide the needs of industry CO4 the importance of projects for job interviews. 4 practical periods of Fifty minutes per week over a semester
		<u>30 MEL0722</u> Computer Aided Design (7th semester) Credits (3-1-2)5	CO1Understanding Introduction and elements of CAD, Essential requirements of CAD CO2Understanding Graphics standards and software, Software Configuration, Graphics Functions, Output primitives- Bresenham's line drawing algorithm and Bresenham's circle generating algorithm CO3Understanding Curves representation, Properties of curve design and representation, Interpolation v/s approximation, Parametric representation of analytic curves CO4Understanding Polygon mesh representations, Quadric and Super quadric surfaces and blobby objects; Solid modeling-Solid entities, Fundamentals of Solid modeling-Set theory CO5Understanding Numerical Methods: Introduction, Errors in numbers, Binary representation of numbers 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 Practical period of Fifty minutes per week over a semester
		<u>31MEL0723</u> Refrigeration And Air Conditioning (7th semester)	CO1Understanding Introduction to refrigeration system, Methods of refrigeration CO2Understanding Vapor Compression System, Single stage system, Analysis of vapor compression cycle, Use of T-S and P-H charts CO3Understanding Principle of vapour absorption refrigeration system, Comparison between absorption and compression systems

		Credits (3-1-2)5	<p>CO4Understanding Introduction to air conditioning, Psychometric properties and their definitions, Psychometric chart, Different Psychometric processes</p> <p>CO5Understanding Refrigeration and air conditioning equipments e. g. compressors, condensers, evaporators & expansion devices, air washers</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 Practical period of Fifty minutes per week over a semester</p>
		<u>32.MEL0726</u> Operations Research (7th semester) Credits (3-1-0)4	<p>CO1Understanding Meaning of Linear Programming, General Mathematical Formulation of LPP</p> <p>CO2Understanding Mathematical Formulation, Initial Basic Feasible Solution</p> <p>CO3Understanding Introduction, Scope in Management Decisions, Queuing Models M/M/1 (Infinite and Finite Population), Probability Calculations arid Application of M/M/C (Infinite Population)</p> <p>CO4Understanding Introduction to Games, Maximin and Minimax Principles, Pure and Mixed Strategies, Solution of Games Using-Algebraic and Graphical Methods</p> <p>CO5Understanding Economic Order Quantity, Economic Production Order, Models with Price Breaks, Lead Times, Stockouts</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p>
	B. Tech Mechanical Engineering (Semester-VII) Elective 1(1)	<u>33. MEE0701</u> Project Management (7th semester) Credits (3-1-0)4	<p>CO1Understanding Project Management Concepts:</p> <p>CO2Understanding Project Organization and Project Contracts</p> <p>CO3Understanding Project Appraisal & Cost Estimation</p> <p>CO4Understanding Project Planning & Scheduling:</p> <p>CO1Understanding Modification & Extensions of Network Models</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p>
	Elective 1(2)	<u>34MEE0702</u> Unconventional manufacturing processes	<p>CO1Understanding Unconventional machining processes</p> <p>CO2Understanding Principles of advanced Unconventional machining processes</p> <p>CO3 Capable of Unconventional welding processes</p>

		(7 th semester) Credits (3-1-0)4	CO4 Capable of Unconventional foaming processes CO5 Capable of Unconventional electric discharge machining process CO6 Capable of Electronic manufacturing processes 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
	Elective 1(3)	<u>35.MEE0703</u> Product Design and Development (7 th semester) Credits (3-1-0)4	CO1 Understanding Introduction to Product Design CO2 Capable of Understanding Product Planning and Marketing CO3 Understanding Product Design Process CO4 Capable of Understanding Product Design Tools CO5 Understanding Quality and Reliability aspects in PDD and Product Appraisal 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
	Elective 1(4)	<u>36.MEE0704</u> Reliability Engineering (7 th semester) Credits (3-1-0)4	CO1 Understanding Definition of reliability CO2 Understanding Reliability Mathematics CO3 Capable of Understanding System Reliability 3 CO4 Capable of Understanding Reliability Improvements Reliability testing 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
	Elective 2(1)	<u>37.MEE0705</u> Non Conventional Energy Resources (7 th semester) Credits (3-1-0)4	CO1 Understanding Non Conventional Energy Resources CO2 Understanding Solar Thermal Energy CO3 Understanding Geothermal Energy CO4 Understanding Wind Energy CO5 Capable of Understanding Thermo - electrical and thermionic conversions 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
	Elective 2(1)	<u>38.MEE0706</u> Optimization methods (7 th semester)	CO1 Understanding Unconstrained Optimization CO2 Understanding Constrained Optimization CO3 Capable of Understanding Optimization and Functions of a Complex CO4 Capable of Understanding Variable and Numerical Optimization in Operation Research

		Credits (3-1-0)4	3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
Elective 2(1)	<u>39.MEE0708</u> Introduction to Computational Fluid Dynamics (7th semester)	Credits (3-1-0)4	CO1 Understanding Introduction and Classification of Partial CO2 Understanding Differential Equation CO3 Understanding Parabolic PDE`s and Stability Analysis CO4 Understanding Elliptic and Hyperbolic Equation CO5 Capable of Understanding Numerical Methods for Conduction Heat Transfer CO6 Capable of Understanding Numerical Methods for Incompressible Fluid Flow 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
Elective 2(1)	<u>40.MEE0709</u> Mechanical system design (7th semester)	Credits (3-1-0)4	CO1 Understanding Engineering process and System Approach CO2 Understanding System Theories CO3 Capable of Understanding Graph Modeling and Analysis CO4 Capable of Understanding System Evaluation CO5 Capable of Understanding Decision Analysis CO6 Understanding System Simulation 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
Hons. Elective III 3(1)	<u>41. MEH0707</u> Theory and Design of Heat Exchangers (7th semester)	Credits (3-1-0)4	Introduction CO1 Understanding Types of heat exchanger CO2 Understanding Design Methodology of heat exchanger CO3 Capable of Understanding Design of tubular heat exchanger CO4 Capable of Understanding Design of extended surface heat exchanger CO5 Capable of Understanding Analysis of heat exchangers 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
Hons. Elective III 3(2)	<u>42. MEH0708</u> Alternative fuels and emission control (7th semester)	Credits (3-1-0)4	CO1 Understanding Alternate Fuels CO2 Understanding Renewable sources of energies CO3 Understanding Pollutants CO4 Capable of Understanding Pollution control Techniques and Test procedures 3 Theory period of Fifty minutes per week over a semester

			1 Tutorial period of Fifty minutes per week over a semester
Hons. Elective III 3(3)	<u>43. MEH0709</u> Concurrent Engineering (7th semester) Credits (3-1-0)4	Introduction CO1 Capable of Understanding Design Product for customer CO2 Understanding Design for Manufacture (DFM) CO3 Capable of Understanding Quality by Design CO4 Capable of Understanding Design for X-ability 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester	
	<u>44.MEC0701</u> Industrial Training Report (7th semester) Credits (0-0-4)2	CO1 to expose students to real work life situations and to equip them with the necessary skills CO2 to intensify the job oppurtunity of students CO3 to provide an exposure to the professional engineering Practices CO4 to provide a potent grooming of the professional career of a fresh engineering graduate CO5 to harvesting of skilled engineers. 4 practical period of Fifty minutes per week over a semester	
	<u>45.MED0702</u> Major Project I Credits (0-0-4)2	CO1 it provides a solid foundation in core mechanical engineering disciplines, and problem-solving skills CO2 provides feasibility study that include the feasibility, need and significance of the process CO3 Develops an ability to identify, critically analyze, formulate and solve engineering problems CO4 it provides an ability to design a system and process to meet desired needs within realistic constraints such as safety, security and manufacturability 4 practical period of Fifty minutes per week over a semester	
	<u>46. MEL0825</u> Automobile Engineering (8th semester) Credits (3-1-2)5	CO1 Understanding Power Unit CO2 Understanding Transmission CO3 Understanding Braking System CO4 Understanding Electrical System CO5 Understanding Automobile Air Conditioning CO6 Understanding Cooling and lubrication System 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester 2 practical period of Fifty minutes per week over a semester	

		<p><u>47. MEL0827</u> CNC, & Flexible Manufacturing Systems (8th semester)</p> <p>Credits (3-0-2)5</p>	<p>CO1 Understanding Introduction to CNC Machine Tools CO2 Capable of Understanding CNC Programming CO3 Capable of Understanding Tooling for CNC Machines CO4 Understanding Robotics and Material Handling Systems CO5 Capable of Understanding Group Technology and Flexible Manufacturing System</p> <p>3 Theory period of Fifty minutes per week over a semester 2 practical period of Fifty minutes per week over a semester</p>
	Elective 3(1)	<p><u>48 MEE 0809</u> Vibration ,Noise Measurement and Control (8th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 Understanding Fundamental Aspects of Vibrations CO2 Understanding Undamped Free Vibrations CO3 Understanding Damped Free Vibrations CO4 Understanding Forced Vibration CO5 Understanding Whirling Motion and Critical Speed CO6 Understanding Systems With Two Degrees of Freedom CO7 Understanding Noise Engineering Sources, Isolation and Control</p> <p>3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester</p>
	Elective 3(2)	<p><u>49.MEE 0810</u> Foundry Engineering (8th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 Understanding Internal Stress, Defects and Surface Finish CO2 Understanding Principles of Gating and Riser CO3 Capable of Understanding Design of Casting and Quality Control CO4 Understanding Furnace Technology CO5 Capable of Understanding Foundry Mechanization and Modernization</p> <p>3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester</p>
	Elective 3(3)	<p><u>50.MEE 0811</u> Advanced Welding Technology (8th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 Understanding Welding Metallurgy CO2 Understanding Weld Design & Quality Control CO3 Understanding Modern Trends in Welding CO4 Understanding Mechanisation in Welding CO5 Understanding Robotics in Welding</p> <p>3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester</p>
	Elective 3(4)	<p><u>51.MEE 0812</u> Tribology (8th semester)</p>	<p>CO1 Understanding Introduction to the concept of tribo design CO2 Understanding Basic principles of tribology CO3 Understanding Elements of Contact Mechanics CO4 Understanding Friction, lubrication and wear in lower kinematic pairs</p>

		Credits (3-1-0)4	CO5 Understanding Sliding-element bearings CO6 Understanding Rolling contact bearings CO7 Understanding Lubrication and efficiency of involute gears 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
Elective 4(1)	<u>52.MEE 0813</u> Computer Integrated Manufacturing	Credits (3-1-0)4	Introduction CO1 Understanding Group Technology and Cellular Manufacturing CO2 Capable of Understanding Computer Aided Process Planning and Flexible Manufacturing System CO3 Capable of Understanding Computer Aided Production Management CO4 Capable of Understanding Automated Material Handling Systems and CO1 Understanding Monitoring and Quality Control 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
Elective 4(2)	<u>53.MEE 0814</u> Non Destructive Testing (8th semester)	Credits (3-1-0)4	CO1 Understanding Common NDT methods CO2 Capable of Understanding Die penetrate test CO3 Capable of Understanding Magnetic particle Inspection CO4 Capable of Understanding Radiographic methods CO5 Understanding Ultrasonic testing methods Eddy Current Inspection 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
Elective 4(3)	<u>54.MEE 0815</u> Design of Machine Tools (8th semester)	Credits (3-1-0)4	CO1 Understanding Machine Tool Drive CO2 Capable of Understanding Regulation of Speed and Feed Rates: CO3 Capable of Understanding Design of Machine Tool Structure CO4 Capable of Capable of Understanding Design of Guide-ways and power Screws CO5 Capable of Understanding Design of Spindles and Spindle Supports CO6 Capable of Understanding Dynamics of Machines Tools 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester

	Elective 4(4)	<u>55.MEE 0816</u> Finite Elemental Method (8th semester) Credits (3-0-0)3	Introduction CO1 Understanding Types of elements used CO2 Understanding Finite element formulation of field problems CO3 Understanding Finite element formulation of solid mechanics problems CO4 Understanding Numerical methods in fem 3 Theory period of Fifty minutes per week over a semester
		<u>56.MED0803</u> Major Project (8th semester) Credits (0-0-16)8	CO1 it provides a solid foundation in core mechanical engineering disciplines, and problem-solving skills CO2 provides feasibility study that include the feasibility, need and significance of the process CO3 Develops an ability to identify, critically analyze, formulate and solve engineering problems CO4 it provides an ability to design a system and process to meet desired needs within realistic constraints such as safety, security and manufacturability 16 Practical period of Fifty minutes per week over a semester

5 YEARS M.TECH. (INTEGRATED.)

EXAMINATION SCHEME, SYLLABI AND COURSES OF STUDY OF M.TECH (INTEG)

FROM SEMESTER 1 TO SEMESTER 6 ARE SIMILAR TO B.TECH/ B.TECH (HONS). THE DIFFERENT SCHEMES AND ADDITIONAL SUBJECTS AS APPLICABLE FROM SEMESTER VII TO SEMESTER X ARE MENTIONED BELOW

		<u>1. MEL0728</u> Research Methodology (7th semester)	CO1 to formally induct the students into the research process including CO2 to provide an overview of methodologies and methods associated with carrying out independent research. CO3 it is designed to provide a basic understanding of the scientific research process. CO4 to formally induct the students into Research Processes–Problem Formulation CO5 to provide an overview of Data Elicitation, Data Analysis and Interpretation of Results.
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		Credits (3-1-0)4	CO6 to provide Simple Linear Regression and Multiple Correlation and Regression 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
		2. MEL 0829 Modeling and simulation (8th semester) Credits (3-1-0)4	CO1 to formally induct the students the Principles of Computer Modeling And Simulation CO2 to provide an overview of Discrete Event Simulation CO3 to provide an overview of Random Number Generation CO4 to provide an overview of Empirical Discrete Distribution CO5 to formally induct the students Design and Evaluation of Simulation Experiments CO6 it is designed to provide a basic understanding of Simulation Software 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
		3. MEL0830 Renewable Energies Technologies (8th semester) Credits (3-1-0)4	CO1 to formally induct the students the concept of Wind Energy CO2 to provide an overview of Biomass energy - Bio fuel – Conversion of biomass CO3 to provide an overview of Wave and Tidal Energy CO4 to provide an overview of Ocean and Geothermal Energy CO5 to formally induct the students of Hydrogen economy CO6 to formally induct the students the Fuel Cells 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over a semester
		4. MEL0931 Advanced Thermodynamics (9th semester)	CO1 to understand Laws of Thermodynamics CO2 it provides clear concept of entropy CO3 to understand relations of Thermodynamics in form of Differential Equations: CO4 it provides clear concept thermodynamic ensemble, micro canonical ensemble, canonical ensemble, grand canonical ensemble,

		<p>Credits (3-1-2)5</p>	<p>CO5 it provides clear concept Equilibrium of Thermodynamic System</p> <p>CO6 it provides clear concept of Statistical Thermodynamics</p> <p>CO7 to understand Maxwell-Boltzmann statistics and distribution, Fermi-Dirac statistics</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 practical period of Fifty minutes per week over a semester</p>
		<p><u>5. MEL0932</u> Computer Aided Design of thermal systems (9th semester)</p> <p>Credits (3-1-2)5</p>	<p>CO1 to understand Basic Consideration in Design: Formulation of Design problems,</p> <p>CO2 to understand Modeling of Thermal System: Types of model, Numerical Modeling & Simulation:, System simulation</p> <p>CO3 to understand Optimization: Basic Concepts, Objective function, constraints</p> <p>CO4 to understand Optimization Methods: Calculus Method</p> <p>CO5 to understand Geometric Programming Introduction to Genetic Algorithms</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over a semester</p> <p>2 practical period of Fifty minutes per week over a semester</p>
	Elective 5(1)	<p><u>6 MEE 0917</u> Theory of Elasticity and Plasticity (9th semester) Credits (3-1-0)4</p>	<p>CO1 to formally induct the students with Unsymmetrical Bending</p> <p>CO2 to understand Shear Centre</p> <p>CO3 to understand Curved Beam</p> <p>CO4 to understand Theory Of Plasticity</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over</p>

	Elective 5(2)	6 MEE 0918 Mechatronics System Design (9th semester) Credits (3-1-0)4	CO1 to understand Mechatronics Systems, Measurement Systems, Control Systems, Microprocessors Based Controllers and Applications CO2 to understand Modeling for Mechatronics system design CO3 to understand MEMS and Microsystems: CO4 to understand Micro System Fabrication Process CO5 to understand Common Hardware Faults, Microprocessor Systems, CO6 to understand Emulation and Simulation, PLC Systems. 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over
	Elective 5(3)	6 MEE 0919 Mechatronics System Design (9th semester) Credits (3-1-0)4	CO1 it provides fundamentals Robotics for Industrial Applications CO2 to understand Basic Robot Configurations and their Relative Merits and Demerits, CO3 to understand Control Loops of Robotic Systems, PTP and CP Trajectory Planning CO4 to understand Kinematics of Robot Manipulator CO5 Homogeneous Robotic Differential Transformation CO6 to understand Robotic Workspace & Motion Trajectory CO7 to understand Robot Teaching 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over
	Elective 5(4)	6 MEE 0920 Robust Design (9th semester) Credits (3-1-0)4	CO1 to understand Robust Design, Experimental Design CO2 to understand Measures of Variability CO3 to understand Analysis and interpretation of experimental data: CO4 to understand fundamentals of design CO5 provides basics of Taguchi's Orthogonal Arrays CO6 provides basics of Signal to Noise ratio (S-N Ratios) CO7 provides basics of Parameter Design and Tolerance Design 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over

<p>Elective 6(1)</p>	<p>6 MEE 0921 Computer Applications in Design (9th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 provides basics of CAD/CAM/CAE Systems CO2 provides basic Concepts of Graphics Programming CO3 concepts of Transformation Matrix, Translation, Rotation, CO4 provides basics of Geometric Modeling Systems: CO5 concepts B- Spline Curve, Evaluation of a B-Spline Curve, CO6. concepts CAD and CAM Integration and Overview of the Discrete Part Production CO7 concepts CAPP, Met CAPP,ICEM-PART, Group Technology 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over</p>
<p>Elective 6(2)</p>	<p>6 MEE 0922 Composite Material Technology (9th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 provides concepts Composite Materials: CO2 provides concepts Macro Mechanics of a Laminate CO3 provides concepts Micro Mechanical Analysis of a Laminate: CO4 provides concepts Failure Criteria CO5 provides concepts Macro Mechanical Analysis of Laminate CO6 provides concepts Analysis of Composite Structures CO7 provides concepts Manufacturing and Testing Aircrafts, missiles, 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over</p>
<p>Elective 6(3)</p>	<p>6 MEE 0923 Theory of Fracture and Failure (9th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1. provides concepts Fracture mechanics principles CO2 provides concepts of NDT and Various NDT methods used in fracture CO3 provides concepts of Plasticity effects, Irwin plastic zone correction CO4 provides concepts of The energy release rate, Criteria for crack growth. CO5 provides concepts Fatigue crack propagation and applications of fracture mechanics CO6 provides concepts Mixed mode (combined) loading and design criteria. 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over</p>

	<p>Elective 6(4)</p>	<p><u>6 MEE 0924</u> Artificial Intelligence and Neural Networks (9th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 to understand structure and function of single neuron, neural network architectures, CO2 to understand Multiclass networks-I, multilevel discrimination, CO3 to understand adaptive multilayer networks. Prediction networks, CO4 to understand Polynomial networks, regularization CO5 to understand counter propagation networks, adaptive resonance theorem, CO6 to understand Associative models, hop field networks, brain state networks, CO7 to understand Boltzmann machines, 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over</p>
	<p>Elective 7(1)</p>	<p><u>6 MEE 0925</u> Advanced Manufacturing Technology (9th semester)</p> <p>Credits (3-1-0)4</p>	<p>CO1 to understand Metal forming CO2 to understand Rolling, forging, drawing, extrusion etc. CO3 to understand Metal casting processes CO4 to understand basics of system design, riser design, solidification structure, solidification shrinkages structure, defects and properties of finished CO5 to understand basics of solidification shrinkages structure, defects and properties of finished casting, CO6 to understand basics of Welding processes, heat flow in welding, failure analysis of weld structure, Destructive & non-destructive testing of weld structures. CO7 to analyze the Machining Processes, optimization of cutting parameters. For minimum cost, for maximum productions CO8 to analyze the Unconventional Machining Process, analysis of electric discharge machining, electro chemical machining, - 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over</p>

	Elective 7(2)	<u>6 MEE 0926</u> Industrial Automation and Robotics (9th semester) Credits (3-1-0)4	CO1 to understand Automation CO2 to understand High Volume Manufacturing Automation CO3 to understand Programmable Manufacturing Automation CO4 to understand Flexible Manufacturing Automation CO5 to understand Assembly Automation: CO6 to understand Robotics, Robot Applications CO7 to understand Robot cell layouts-Multiple robots & Machine interference 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over
	Elective 7(3)	<u>6 MEE 0927</u> Six Sigma Methods & Applications (9th semester) Credits (3-1-0)4	CO1 to understand Conventional and Six Sigma concept of quality CO2 to understand Statistical foundation and methods of quality improvement. Descriptive statistics CO3: understand Concept of Six Sigma, Defects, DPMO, DPU CO4 understand Methodology of Six Sigma, DMAIC, DFSS CO5 CO6 understanding Six Sigma Tools: Project Charter, Process mapping CO7 understanding Sustenance of Six Sigma, Communication plan to software's for Six Sigma 3 Theory period of Fifty minutes per week over a semester 1 Tutorial period of Fifty minutes per week over
	Elective 7(4)	<u>6 MEE 0928</u> Computer Aided Manufacturing (9th semester) Credits (3-1-0)4	CO1 understanding Need and future of NC Systems and CAM, Advantages and Disadvantages CO2 understanding Methods for improving accuracy and productivity. CO3 understanding Types of CNC Machine Tools systems devices Direct Numerical Control (DNC), CO4 understanding NC Part Programming Generation of NC Programmes through CAD/CAM CO5 understanding Computer Aided Process Planning: CO6 understanding Computer Integrated Manufacturing: Introduction, features and applications

			<p>CO7 understanding Artificial Intelligence in Manufacturing: application in manufacturing, Case studies.</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over</p>
		<p><u>6 MED 0904</u> Dissertation Part- I</p> <p>Credits (3-1-0)4</p>	<p>CO1To achieve excellence in all its endeavors to face global challenges</p> <p>CO2To network with global Institutions of Excellence, Business, Industry and Research Organizations</p> <p>CO3To contribute to the knowledge base through Scientific enquiry, Applied Research and Innovation.</p> <p>3 Theory period of Fifty minutes per week over a semester</p> <p>1 Tutorial period of Fifty minutes per week over</p>
		<p><u>6 MED 1005</u> Dissertation Part- II</p> <p>Credits (0-0-40)20</p>	<p>CO1To enable the students to formulate, design and solve problems in applied mechanical engineering</p> <p>CO2To provide adequate knowledge to meet the requirement of the mechanical industry.</p> <p>CO3To train the students to pursue higher education and research.</p> <p>CO4 Be able to analyze, design and implement thermal design, production systems considering all aspects</p> <p>CO 5 Have in-depth knowledge and capability to use industry standard tools in the design and implementation of mechanical Systems.</p> <p>40 practical period of Fifty minutes per week over a semester</p>