Teerthanker Mahaveer University Faculty of Engineering

B.Tech. (Mechanical Engineering)

Programme Outcome

PO-1	:	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO-2	••	Problem analysis & Solving: Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO-3	••	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.
PO-4	•	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, synthesis of the information to provide valid conclusions.
PO-5	:	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

Programme Specific Outcome

PSO-1	:	Understanding knowledge of mathematics, engineering and science to identify. Formulate, analyze the engineering problems and find cost-
		effective and optimal solution of real-life problems.
PSO-2	•••	Applying mechanical engineering concepts and tools to solve complex engineering and industrial problems in the field of Manufacturing Engineering, Thermal Engineering And Design Engineering.
PSO-3	••	Analyzing managerial and entrepreneurial skills to work effectively in multidisciplinary Teams for building nation and helping society by following ethical and environmental friendly practices.
PSO-4	:	Evaluating the need of lifelong learning and will engage in learning modern techniques and engineering tools like CAD, Solid Works, CNC machining, 3D printing etc.
PSO-5	•	Creating positive attitude for conducting experiments and developing new concepts on emerging fields.

		Course Outcomes
EAS116	CO1.	Understanding the concepts of eigen values and eigenvectors,
		Optimization & derivatives of functions of several variables,
		partial and total differentiation, implicit functions.
	CO2.	Understanding the concepts of curl and divergence of vector
		field.
	CO3.	Understanding of Green's theorem, Gauss Theorem, and
		Stokes theorem.
	CO4.	Applying the concept of Leibnitz's theorem for successive
		derivatives.
	CO5.	Analyzing the intangibility of a differential equation to find
		the optimal solution of first order first degree equations.
EAS112	CO1.	Understanding the basic concepts of interference, diffraction
		and polarisation.
	CO2.	Understanding the concept of bonding in solids and
		semiconductors.
	CO3.	Understanding the special theory of relativity.
	CO4.	Applying special theory of relativity to explain the
		phenomenon of length contraction, time dilation, mass-
		energy equivalence etc.
	CO5.	Applying the concepts of polarized light by the Brewster's and
		Malus Law
EAS113	CO-1	Understanding the concept of softening & purification of
		water.
	CO-2	Understanding calorific value& combustion, analysis of coal,
		Physical & Chemical properties of hydrocarbons & quality
		improvements.
	CO-3	Understanding the concept of lubrication, Properties of
		Refractory & Manufacturing of cements.
	CO-4	Applying the concepts of the mechanism of polymerization
		reactions, Natural and synthetic rubber& vulcanization.
	CO-5	Applying the concepts of spectroscopic & chromatographic
		techniques.
EAS117	CO-1	Understanding the basics of Network, AC Waveform and its
		characteristics.
	CO-2	Understanding the basic concept of Measuring Instruments,
		Transformers & three phase Power systems.
	CO-3	Understanding the basic concepts of Transformer.
	CO-4	Understanding the basic concept of power measurement
		using two wattmeter methods.
	CO-5	Applying the concept of Kirchhoff's laws and Network
		Theorems to analyze complex electrical circuits.
EAS161	CO-1	Understanding the concepts of Kirchoff & Voltage law.

	CO-2	Understanding the concepts of dc network theorem.
	CO-3	Analyzing the energy by a single-phase energy meter.
	CO-4	Analyzing the losses and efficiency of Transformer on
		different load Conditions.
	CO-5	Analyzing the electrical circuits using electrical and electronics
		components on bread board.
EEC111	CO-1	Understanding the concepts of electronic components like
		diode, BJT & FET.
	CO-2	Understanding the applications of pn junction diode as
		clipper, clamper, rectifier & regulator whereas BJT & FET as
		amplifiers
	CO-3	Understanding the functions and applications of operational
		amplifier-based circuits such as differentiator, integrator, and
		inverting, non-inverting, summing & differential amplifier.
	CO-4	Understanding the concepts of number system, Boolean
		algebra and logic gates.
	0-5	Applying the knowledge of series, parallel and
EEC161	<u> </u>	Electromagnetic circuits.
EECIOI	CO^{-1}	Understanding the implementation of Operational amplifier
	0-2	based circuits
	CO-3	Analyzing the characteristics of pn junction diode & BIT
	CO-4	Analyzing the different narameters for characterizing
		different circuits like rectifiers, regulators using diodes and
		BJTs.
	CO-5	Analyzing the truth tables through the different type's adders.
TMU101	CO-1	Understanding environmental problems arising due to
		constructional and developmental activities.
	CO-2	Understanding the natural resources and suitable methods
		for conservation of resources for sustainable development.
	CO-3	Understanding the importance of ecosystem and biodiversity
		and its conservation for maintaining ecological balance.
	CO-4	Understanding the types and adverse effects of various
		environmental pollutants and their abatement devices.
	CO-5	Understanding Greenhouse effect, various Environmental
		laws, impact of human population explosion, environment
		protection movements, different disasters and their
		management.
TMUGE101	CO-1	Remembering and understanding of the basic of English
		grammar and vocabulary.
		Understanding of the basic Communication process.
	CO-3	Applying correct vocabulary and tenses in sentences
		construction.

	CO-4	Analyzing communication needs and developing
		communication strategies using both verbal & non-verbal
		method.
	CO-5	Drafting applications in correct format for common issues.
	CO-6	Developing self-confidence.
EME161	CO-1	Understanding the concepts of Engineering Drawing.
	CO-2	Understanding how to draw and represent the shape, size &
		specifications of physical objects.
	CO-3	Applying the principles of projection and sectioning.
	CO-4	Applying the concepts of development of the lateral surface
		of a given object.
	CO-5	Creating isometric projection of the given orthographic
		projection.
EME162	CO-1	Understanding the concepts to prepare simple wooden joints
		using wood working tools.
	CO-2	Applying the techniques to produce fitting jobs of specified
		dimensions.
	CO-3	Applying the concepts to prepare simple lap, butt, T and
		corner joints using arc welding equipment.
	CO-4	Applying the concepts of black smithy and lathe machine to
		produce different jobs.
	CO-5	Creating core and moulds for casting.
EAS211	CO-1	Understanding the concepts of the wave, diffusion and
		Laplace equations & Fourier series.
	CO-2	Understanding the methods of separation of variables.
	CO-3	Understanding the concepts of Fourier series' representation
		of single variable function.
	CO-4	Applying Laplace transform to determine the complete
		solutions of linear ODE.
	CO-5	Applying the method of variations of parameters to find
		solution of equations with variable coefficients.
EAS212	CO-1	Understanding the basic concepts of interference, diffraction
		and polarisation.
	CO-2	Understanding the concept of bonding in solids and
		semiconductors.
	CO-3	Understanding the special theory of relativity.
	CO-4	Applying special theory of relativity to explain the
		phenomenon of length contraction, time dilation, mass-
		energy equivalence etc.
	CO-5	Applying the concepts of polarized light by the Brewster's and
		Malus Law.
EAS262	CO-1	Understanding of the operation of various models of optical
		devices.

	CO-2	Understanding types of Semiconductors using Hall
		experiments.
	CO-3	Applying the concept of interference, polarization &
		dispersion in optical devices through Newton's ring, Laser,
		polarimeter & spectrometer.
	CO-4	Applying the concept of resonance to determine the AC
		frequency using sonometer & Melde's apparatus.
	CO-5	Applying the concept of resolving & dispersive power by a
		prism.
EAS263	CO-1	Understanding the concept of softening & purification of
		water.
	CO-2	Understanding calorific value& combustion, analysis of coal,
		Physical & Chemical properties of hydrocarbons & quality
		improvements.
	CO-3	Understanding the concept of lubrication, Properties of
		Refractory & Manufacturing of cements.
	CO-4	Applying the concepts of the mechanism of polymerization
		reactions, Natural and synthetic rubber& vulcanization.
	CO-5	Applying the concepts of spectroscopic & chromatographic
		techniques.
EEE217	CO-1	Understanding the basics of Network, AC Waveform and its
		characteristics.
	CO-2	Understanding the basic concept of Measuring Instruments,
		Transformers & three phase Power systems.
	CO-3	Understanding the basic concepts of Transformer.
	CO-4	Understanding the basic concept of power measurement
	<u> </u>	using two wattmeter methods.
	CO-5	Applying the concept of Kirchhoff's laws and Network
FFF261	<u> </u>	Inderstanding the sensents of Kirshoff & Voltage law
EEEZOI	<u> </u>	Understanding the concepts of Kirchon & Voltage law.
	CO-2	Analyzing the onergy by a single phase energy meter
	CO 4	Analyzing the losses and officiency of Transformer on
	0-4	different load conditions
	CO-5	Analyzing the electrical circuits using electrical and electronics
	CO-3	components on bread board
FFC211	CO-1	Understanding the concepts of electronic components like
		diode. BJT & FET.
	CO-2	Understanding the applications of pn junction diode as
		clipper, clamper, rectifier & regulator whereas BJT & FET as
		amplifiers
	CO-3	Understanding the functions and applications of operational
		amplifier-based circuits such as differentiator, integrator, and

		inverting, non-inverting, summing & differential amplifier.
	CO-4	Understanding the concepts of number system, Boolean
		algebra and logic gates.
	CO-5	Applying the knowledge of series, parallel and
		electromagnetic circuits.
EEC261	CO-1	Understanding the implementation of diode-based circuits.
	CO-2	Understanding the implementation of Operational amplifier-
		based circuits.
	CO-3	Analyzing the characteristics of pn junction diode & BJT.
	CO-4	Analyzing the different parameters for characterizing
		different
		circuits like rectifiers, regulators using diodes and BJTs.
	CO-5	Analyzing the truth tables through the different type's adders.
ECS212	CO-1	Understanding the concept of various components of
		computer system
	CO-2	Understanding the Object-Oriented Programming Language
		concepts.
	CO-3	Analyzing basic mathematical problem and their solutions
		through programming
	CO-4	Applying the concepts of programming solutions for distinct
		problems
	CO-5	Applying the concepts of scalable solutions through function
ECS262	CO-1	Understanding the concepts of execution to programs written
		in C language.
	CO-2	Applying to prepare programming solutions for specific
		problems.
	CO-3	Applying to prepare scalable solutions through functions.
	CO-4	Applying basic elements of a C program including arithmetic
		and logical operators, functions, control structures, and arrays
	CO-5	Analyzing basic mathematical problem and their solutions
T N 41 (05004		through programming.
INUGE201	CO-1	Remembering & understanding the basics of English Grammar
	<u> </u>	dilu vocabulary.
	CO-2	Chille
	CO-3	Understanding principles of letter drafting and various types
	CO-5	of formats
	CO-4	Applying correct vocabulary and grammar in sentence
		construction while writing and delivering presentations.
	CO-5	Analyzing different types of listening, role of Audience &
		Locale in presentation.
	CO-6	Drafting Official Letters, E-Mail & Paragraphs in correct
		format.

EME261	CO-1	Understanding the concepts of Engineering Drawing.
	CO-2	Understanding how to draw and represent the shape, size &
		specifications of physical objects.
	CO-3	Applying the principles of projection and sectioning.
	CO-4	Applying the concepts of development of the lateral surface
		of a given object.
	CO-5	Creating isometric projection of the given orthographic
		projection.
EME262	CO-1	Understanding the concepts to prepare simple wooden joints
		using wood working tools.
	CO-2	Applying the techniques to produce fitting jobs of specified
		dimensions.
	CO-3	Applying the concepts to prepare simple lap, butt, T and
		corner joints using arc welding equipment.
	CO-4	Applying the concepts of black smithy and lathe machine to
		produce different jobs.
	CO-5	Creating core and moulds for casting.
EME311	CO-1	Understanding the system of forces, free body diagrams and
		resultant of forces and/or moments.
	CO-2	Applying the laws of mechanics to determine efficiency of
		simple Machines with consideration of friction.
	CO-3	Analyzing the loads and support reactions on a structural
		member.
	CO-4	Analyzing the planner areas and location of their centroid.
	CO-5	Evaluating the internal reactions in a beam; draw correct
		shear-force and bending moment diagrams.
EME312	CO-1	Understanding the basic concept of thermodynamics like
		system, surrounding, macroscopic, microscopic, heat, work
		and reversibility.
	CO-2	Applying the laws of thermodynamics to determine the
		efficiency of engine and COP of heat pump and refrigerator.
	CO-3	Analyzing the properties of pure substances, draught of boiler
		based on critical thinking and problem solving skill.
	CO-4	Evaluating different vapour power cycles Rankine cycles,
		reheat cycles regenerative cycles.
	CO-5	Creating thermodynamic models and prototype of gas turbine
		and jet propulsion.
EME362	CO-1	Understanding the working of various types of boiler used in
		power production.
	CO-2	Understanding and formulating power production based on
		the fundamental laws of thermal engineering.
	CO-3	Understanding the application of appropriate experiments
		related to heat engines.

	CO-4	Applying energy conversion process in mechanical power
		generation for the benefit of mankind.
	CO-5	Evaluating the feasibility of various energy conversion
		processes.
EME313	CO-1	Understanding the basic concepts related to internal
		structure of material, miller-indices, strain-hardening,
		magnetism and imperfection in solids
	CO-2	Understanding the purpose of heat treatment in material and
		importance of TTT curve in steel.
	CO-3	Understanding the various sources, properties and application
		of Plastics, Ceramics, Composite, Nano and Smart materials.
	CO-4	Analyzing various properties and application of ferrous and
		non - ferrous material and apply its knowledge to select
		suitable material for specific purpose.
	CO-5	Evaluating mechanical properties of material such as Tensile,
		Hardness, Torsion and Fatigue strength by performing various
		mechanical testing.
EME363	CO-1	Understanding the basic steps of specimen preparation for
		microstructure examination.
	CO-2	Analyzing the testing results of tensile and compression test
		on metallic and nonmetallic specimens by conducting on
		universal testing machine
	CO-3	Analyzing the testing results of IZOD and CHARPY test by
		conducting on metallic specimens.
	CO-4	Analyzing the testing results of Brinell and Rockwell hardness
		on metallic specimens.
	CO-5	Evaluating the microstructure of different metallic materials.
EME314	CO-1	Understanding various concepts and techniques of Industrial
		Engineering like productivity, work study, facility location
		decisions, principles of facility layout and principles of
		material handling.
	CO-2	Applying functions of PPC like routing, scheduling,
	<u> </u>	dispatching, loading & follow-up in industry.
	CO-3	Analyzing break even chart, acceptance sampling plans,
	<u> </u>	Fixed accession of fixed access through various
	CO-4	methods: oconomic order quantity for inventory management
		hy EOO model: job evaluation merit rating and wage
		incentive plans by various methods
	CO-5	Creating organizational charts as per organization's needs
FHM311	CO-1	Understanding various types of Inventory model with
		different parameters.
	CO-2	Applying the concept of formulation of the problem and their

		desired output by either graphical and simplex methods
	CO-3	Analyzing various methods to minimize the transportation
		cost corresponding to factories and their inventories.
	CO-4	Evaluating the process by which job to be assign a particular
		machine and worker to reduce the cost and time using
		Hungarian methods
	CO-5	Creating an appropriate method to analysis the decision tree
		in the analysis of sequencing problem.
EME361	CO-1	Understanding the conventional representation of materials
		and machine elements, surface roughness symbols,
		machining symbols and the basic concepts of AutoCAD.
	CO-2	Applying the knowledge to draw the popular forms of screw
		threads bolts and rivet joints.
	CO-3	Analyzing the machine components and assembly drawings
		based on critical thinking and problem-solving skills.
	CO-4	Evaluating and interpreting engineering technical drawings of
		parts and assemblies.
	CO-5	Creating the assembly drawing of cross heads & eccentrics,
		shaft coupling-spigot & socket pipe joint, cotter joints &
		knuckle joint, screws jacks and plummer block using AutoCAD
		parametric software.
TMUGA-301	CO-1	Solving complex problems using Criss cross method, base
		method and square techniques.
	CO-2	Applying the arithmetical concepts of Average, Mixture and
		Allegation.
	CO-3	Evaluating the different possibilities of various reasoning
	<u> </u>	Dased problems in series, Blood relation and Direction.
	0-4	Profit Loss and Discount Si/CL and Mixture/Allogation
	<u> </u>	Profit Loss and Discourt, SI/Cr and Mixture/Anegation.
	0-1	concepts and Die Casting machine
	CO-2	Applying the concept of Various manufacturing process
		implementation and their desired output
	CO-3	Analyzing various sheet operations compound progressive
		die nunch assembly and their operation analysis
	CO-4	Evaluating the working principal of back rollers, rolling mills
		and their comparative analysis.
	CO-5	Creating an appropriate method to understanding the
		process, drawing, extrusion, deep drawing and their practical
		output.
EME461	CO-1	Understanding various types of tool used in various
		manufacturing process.
	CO-2	Applying various sheet metal work using die and punch

		assembly to production of washer as well as hole with desired
		structure.
	CO-3	Analyzing various method of the rolling process to reduce the
		diameter of thin sheet and also importance of back rollers in
		the process.
	CO-4	Evaluating the property of the different category of the sand
		and calculate the grain fineness (GFN) of the sand.
	CO-5	Creating method for the development of the pattern, mould
		and the casting process with a unique specification
EME413	CO-1	Understanding various types of measurement systems,
		measuring instruments, Sensor and transducers.
	CO-2	Applying the concept of measurements on different strain
		gauges.
	CO-3	Analyzing standard of linear measurement line and end
		standard, limits, fits and tolerance.
	CO-4	Evaluating measurement of geometric form straightness
		flatness roundness profile projector and auto collimator
		valuate and interpret different psychrometric process, cooling
		and heating load calculations and grand sensible heat factor.
	CO-5	Creating models on hydraulic and pneumatic control systems.
EME462	CO-1	Understanding the measurement of linear dimensions using
		various measuring instruments.
	CO-2	Applying bevel protractor and sine bar to measure angles.
	CO-3	Applying measuring instruments to measure circularity,
		roundness and roughness.
	CO-4	Applying measuring devices to measure temperature and
		pressure.
	CO-5	Evaluating and compare component sizes with standard size
		using dial indicator.
EME414	CO-1	Understanding the concepts of fluid behavior.
	CO-2	Applying the concept of fluid mechanics on static as well as
		dynamic conditions.
	CO-3	Analyzing the mechanics related to fluid motion.
	CO-4	Evaluating different problems related to the fundamental
		principles of fluid statics, fluid kinematics and fluid dynamics.
	CO-5	Creating designs of different machining equipment's using
		fluid as a working medium.
EME463	CO-1	Understanding the concept of Fluid flow behavior such as
		laminar transition and turbulent.
	CO-2	Applying the concept of Bernoulli's Equation on pipe flow.
	CO-3	Analyzing the discharge coefficient and friction coefficient
		value for applications of Bernoulli's Equation.
	CO-4	Evaluating different calculations to verify different fluid

		equations.
	CO-5	Creating different models with fluid as a working medium.
TMUGE401	CO-1	Understanding knowledge of grammar to face competitive
		exams.
	CO-2	Understanding advance English language by using variety of
		words i.e. idioms and phrase in variety of sentences in
		functional context.
	CO-3	Understanding listening for effective communication.
	CO-4	Applying their English grammar knowledge in day to day
		context.
	CO-5	Applying writing and comprehensive skills in English.
TMUGA-401	CO-1	Applying the arithmetical concepts in Ratio Proportion Variation.
	CO-2	Employing the techniques of Percentage; Ratios and Average
		in inter related concepts of Time and Work, Time Speed and
		Distance.
	CO-3	Identifying different possibilities of reasoning based problems
		of Syllogisms and Venn diagram.
	CO-4	Examining the optimized approach to solve logs and Surds.
	CO-5	Applying the arithmetical concepts in Ratio Proportion
		Variation.
EME561	CO-1	Understanding the various types of tools and machining
		operations such as surface grinding, gear cutting etc.
	CO-2	Applying various types of joining processes on workpiece.
	CO-3	Analyzing various tool cutting parameters.
	CO-4	Evaluating the methods of welding, soldering and brazing.
	CO-5	Creating weld joints with different welding machines.
EME512	CO-1	Understanding complex systems of linkages, gears and cams.
	CO-2	Applying law of gearing and gear trains concepts.
	CO-3	Analyzing slider cranks & bar mechanism; piston and crank
		mechanism.
	CO-4	Analyzing problems related to governers.
	CO-5	Evaluating problems related to flywheel, effect of gyroscopic
		couple upon the stability of aero planes, ships, two & four-
	<u> </u>	Understanding the dynamics of various moving objects
EIVIESOZ	CO-1	Applying the practical and theoretical balancing of rotating
	0-2	masses.
	CO-3	Applying the concepts of governor and gyroscope.
	CO-4	Analyzing the kinematics of the three-Dimensional particle
		motion in various coordinate systems.
	CO-5	Evaluating themometry of inertia of any object.
	CO-6	Evaluating natural frequency of vibration of a system.

EME513	CO-1	Understanding the basic laws of heat and mass transfer.
	CO-2	Applying in the performance of heat exchangers.
	CO-3	Analyzing problems involving fin with different geometries
		and steady state heat conduction in simple geometries.
	CO-4	Evaluating transient heat conduction in simple geometries.
	CO-5	Evaluating heat transfer relations for laminar film
		condensation on vertical surfaces and on horizontal tube.
EME563	CO-1	Understanding thermal properties of material by applying 1-D
		steady state heat transfer equation.
	CO-2	Understanding effectiveness of parallel and counterflow heat
		exchangers.
	CO-3	Applying Fourier's law to validate the theoretical over all heat
		transfer coefficient.
	CO-4	Analyzing and determine non-dimensional numbers to
		evaluate and validate heat transfer parameters.
	CO-5	Evaluating fin efficiency and fin effectiveness.
EME514	CO-1	Understanding different parts and assemblies used in
		automotive vehicles.
	CO-2	Applying concepts related to transmission system.
	CO-3	Analyzing braking system, electrical system and various types
		of suspension systems.
	CO-4	Evaluating loads on the frame; strength and stiffness for
		chassis and suspension system.
	CO-5	Evaluating different types of lubrication and maintenance
		strategies for automobiles.
EME515	CO-1	Understanding different types of energy audit, its basic
		components, instrumentation and techno economic analysis
		used in energy audit
	CO-2	Applying different types of insulation and refractory's,
		mechanism of FBC boiler and find losses and blow down in
		boller.
	CO-3	Applying steam system, steam recovery system, cogeneration
	<u> </u>	and trigeneration.
	CO-4	different types of compressed air system
	CO F	Dilling neuror factor, tupos of electric motors, losses and
	0-5	officiones in meters
	<u> </u>	Understanding the importance of value education in life and
CHINIOT2		method of self-evoloration
	<u> </u>	Induction of self-exploration.
		Validation as the mechanism for self-evolutation
	() 3	Applying right understanding about relationship and physical
		facilities
		facilities.

	CO-4	Analyzing harmony in myself, harmony in the family and
		society, harmony in the nature and existence.
	CO-5	Evaluating human conduct on ethical basis.
TMUGA-501	CO-1	Applying the concepts of modern mathematics Divisibility
		rule, Remainder Theorem, HCF /LCM in Number System.
	CO-2	Relating the rules of permutation and combination,
		Fundamental Principle of Counting to find the probability.
	CO-3	Applying calculative and arithmetical concepts of ratio,
		Average and Percentage to analyze and interpret data.
	CO-4	Correlating the various arithmetic concepts to check
		sufficiency of data
	CO-5	Applying the concepts of modern mathematics Divisibility
		rule, Remainder Theorem, HCF /LCM in Number System.
TMUGS- 501	CO-1	Utilizing effective verbal and non-verbal communication
		techniques in formal and informal settings
	CO-2	Understanding and analyzing self and devising a strategy for
		self growth and development.
	CO-3	Adapting a positive mindset conducive for growth through
		optimism and constructive thinking.
	CO-4	Utilizing time in the most effective manner and avoiding
		procrastination.
	CO-5	Making appropriate and responsible decisions through
		various techniques like SWOT, Simulation and Decision Tree.
EME611	CO-1	Understanding the method of refrigeration, Air craft
	<u> </u>	retrigeration systems and DART
	CO-2	Applying steady flow energy equation and determine the COP
	<u> </u>	Analyzing the vanor absorption cycle and component
	CO-3	assemblies based on critical thinking and problem-solving skill
	CO-4	Evaluating and interpret different psychometric process
		cooling and heating load calculations and grand sensible heat
		factor.
	CO-5	Creating refrigeration and air conditioning models and
		prototypes of air washer cooling tower ice plant and water
		cooler
EME661	CO-1	Understanding the construction and working of a domestic
		refrigerating system and window air conditioner.
	CO-2	Understanding different parts of automobile AC test rig and
		air washer.
	CO-3	Evaluating the volumetric efficiency of semi sealed, open type
		and Reciprocating compressors.
	CO-4	Evaluating the coefficient of performance by performing
		experiment on vapour compression refrigeration systems.

	CO-5	Evaluating the refrigeration effect by using the different
		diameters expansion devices used in refrigeration system.
EME612	CO-1	Understanding the need and importance of vibration analysis
		in mechanical design of machine parts that operate in
		vibratory conditions
	CO-2	Applying linear mathematical models to real life engineering
		systems.
	CO-3	Applying Lagrange's equations for linear and nonlinear
		vibratory systems.
	CO-4	Analyzing the mathematical model of a linear vibratory
	CO-5	Evaluating vibratory responses of SDOE and MDOE systems to
		harmonic, periodic and non-periodic excitation.
EME613	CO-1	Understanding design process, design standards & selection of preferred size.
	CO-2	Applying theories of failure, Soderberg & Goodman criteria on machine elements.
	CO-3	Analyzing problems related to design of machine elements
		based on permissible load (for given operating conditions),
		required element life, manufacturing considerations.
	CO-4	Evaluating design of machine elements against static and
		fatigue loads.
	CO-5	creating designs for different machine elements like joints,
EEE61 <i>1</i>	<u> </u>	Sharts, bearings, gears, screws etc.
	CO-1	technologies.
	CO-2	Applying knowledge for development based upon different
		energy resources.
	CO-3	Analyzing the various concepts behind renewable energy
		resources.
	CO-4	Evaluating the need of different renewable energy sources
		and their importance
	CO-5	Creating awareness about the major environmental issues
		based on Non-Conventional Energy Resources for a
		sustainable development.
TMUGE601	CO-1	Remembering adequate knowledge of grammar and
		vocabulary through prescribed text to address competitive
	(0-2	Understanding the value of listening to understand the basic
		content.
	CO-3	Understanding the usage of English grammar in day to day
		context.
	CO-4	Understating about the skills required in corporate world.

	CO-5	Applying writing and comprehensive skills in English.
EME662	CO-1	Understanding the concepts and commands of solid modeling
		with Solidworks software.
	CO-2	Applying the commands to draw the simple and complex
		machine parts and components with dimensional
		specifications.
	CO-3	Analyzing the designs of machine components and assembly
		products based on kinematics using Solidworks motion.
	CO-4	Evaluating and interpreting the designs of machine parts and
		assemblies using software simulation.
	CO-5	Creating the final design of engineering products like coupling
		shaft, flange and drum assembly, elbow and suspension
		assembly etc. using Solidworks parametric modeling software.
TMUGA-601	CO-1	Recognizing the rules of Crypt-arithmetic and relate them to
		find out the solutions.
	CO-2	Illustrating the different concepts of Height and Distance and
		Functions.
	CO-3	Employing the concept of higher level reasoning in Clocks,
		Calendars and Puzzle Problems.
	CO-4	Correlating the various arithmetic and reasoning concepts in
		checking sufficiency of data.
	CO-5	Recognizing the rules of Crypt-arithmetic and relate them to
		find out the solutions.
TMUGS-601	CO-1	Communicating effectively in a variety of public and
		Interpersonal settings.
	CO-2	Applying concepts of change management for growth and
		mastering the Laws of Change
	<u> </u>	Analyzing sconarios, synthesizing alternatives and thinking
	0-5	critically to perotiate resolve conflicts and develop cordial
		internersonal relationships
	CO-4	Functioning in a team and enabling other people to act while
		encouraging growth and creating mutual respect and trust.
	CO-5	Handling difficult situations with grace, style, and
		professionalism.
EME711	CO-1	Understanding the principles of engineering design and the
		role of graphics & software to generate computer models.
	CO-2	Applying parametric modeling to manufacturing and
		engineering concepts.
	CO-3	Analyzing computer aided design models and assemblies.
	CO-4	Evaluating and interpreting engineering technical drawings of
		parts and assemblies according to engineering design
		standards and finite element methods.

	CO-5	Creating parametric 3-D models and prototypes to design and
		build mechanical parts and assemblies using parametric
		software and 3-D printers.
EME761	CO-1	Understanding the concepts of drafting and modeling with
		the PTC Creo and ANSYS software.
	CO-2	Applying parametric modeling to prepare complex mechanical
		parts and assembly.
	CO-3	Analyzing the machine components and assembly drawings
		based on mesh generation using finite element methods
		(FEM).
	CO-4	Evaluating and interpreting engineering technical drawings of
		parts and assemblies according to engineering design
		standards.
	CO-5	Creating parametric 3-D designs to build mechanical parts and
		assemblies like Flange and Drum, elbow and suspension,
		connecting rod and piston assembly, Plummer Block and
5845742	60.4	Assembly using PTC Creo parametric software.
EIVIE/12	CO-1	Understanding the operating characteristics and
		thermodynamic analysis of common internal compustion
	<u> </u>	engine cycles using air standard Otto, Diesei and dual cycles.
	CO-2	their combustion characteristics
	<u> </u>	Applying the understanding of the generation of undesirable
	CO-3	expanse emissions to solve the environmental pollution
		nrohlems
	CO-4	Analyzing the working of various types of cooling lubricating
		and ignition systems associated with internal combustion
		engines.
	CO-5	Evaluating the heat balance to measure performance
		parameters like thermal efficiency, fuel consumption,
		indicated power and brake power of internal combustion
		engine.
EME762	CO-1	Understanding the working of various systems employed in
		internal combustion engine like fuel supply system and
		ignition system.
	CO-2	Applying theoretical and practical limits to engine
		performance and fuel economy.
	CO-3	Analyzing the differences combustion engine designs.
	CO-4	Analyzing the working and tuning of carburetor used in SI
		engine.
	CO-5	Creating knowledge to solve real world engine design issues.
EME713	CO-1	Understanding the concepts of power, energy, and basic
		working principles of steam, gas Turbine, diesel engine,

		nuclear and non-conventional power plants.
	CO-2	Applying the methods of depreciation, replacement, and
		economics of plant selection.
	CO-3	Analyzing different types of steam cycles and estimate
		efficiencies in a steam power plant.
	CO-4	Evaluating cycle efficiency and performance of a gas cooled
		reactor power plant.
	CO-5	Evaluating the electrical system required for power plants.
EME714	CO-1	Understanding the impact of jet, principle of working of water
		turbines.
	CO-2	Understanding the concepts of centrifugal pump,
		reciprocating pump and other hydraulic devices.
	CO-3	Applying the velocity diagrams, work done and efficiency
		calculations for water turbines and different pumps.
	CO-4	Analyzing the performance characteristics of centrifugal
		pumps.
	CO-5	Evaluating the discharge, and power required to drive a
		reciprocating pump.
EME715	CO-1	Understanding fundamentals of compressible flow. Isentropic
		flow, Rayleigh flow and Fanno flow
	CO-2	Applying the concepts for determining the effect of Mach
		number on compressibility.
	CO-3	Applying the working charts and gas tables for determining
		the parameters of one-dimensional isentropic flow.
	CO-4	Analyzing the normal shock waves in Fanno and Rayleigh
		flows.
	CO-5	Evaluating the Fanno and Rayleigh flows with the help of
		tables and charts.
EHM735	CO-1	Understanding the concepts of sociology, trace its historical
		development, and social impact of industrialization.
	CO-2	Understanding the nature of modern societies, significance of
		the current service sector, and importance of work
		experience in Industry
	CO-3	Understanding the concepts related the industrial work.
	CO-4	Analyzing the problems of business Ethics.
	CO-5	Creating corporate Organizational settings.
EHM736	CO-1	Understanding the concept, evolution management and
		organizational Behavior
	CO-2	Applying managerial functions like planning, organizing,
		staffing, leading & controlling in decision making.
	CO-3	Applying theories of motivation, leadership, personality and
		learning in organizational settings.
	CO-4	Analyzing methods of conflict and stress management

	CO-5	Evaluating budgetary and non-budgetary controlling
		techniques.
EHM734	CO-1	Understanding different market structures and price
		determination in different market conditions.
	CO-2	Understanding the concepts of national income, inflation, and
		business cycles.
	CO-3	Applying the concepts of demand analysis.
	CO-4	Evaluating fixed cost, variable cost, average cost, marginal
		cost, Opportunity cost.
	CO-5	Understanding different market structures and price
		determination in different market conditions.
EME811	CO-1	Understanding types of automation, production concepts and
		CNC machine.
	CO-2	Applying the concept of Computer aided process planning,
		MRP and CNC part programming to the automated
		manufacturing systems.
	CO-3	Analyzing various automated flow lines, machine cells, various
		robot configurations and their motions.
	CO-4	Evaluating the part programming and machining parameters
	<u> </u>	for the automated production flow lines problems.
	CO-5	Creating appropriate automated assembly systems using
	60.1	automation manufacturing techniques and robot applications.
EIVIE812	0-1	mapufacturing Processos
	<u> </u>	Applying the best suitable machining process for a workniece
	CO-2	hased on its material properties
	CO-3	Analyzing working principles and processing characteristics of
		ultra-precision machining processes
	CO-4	Evaluating the precision using high-speed machining methods.
		and nontraditional machining to the production of precision
		components.
	CO-5	Creating an in-depth approach regarding application of
		unconventional manufacturing processes for industrial
		production.
EME813	CO-1	Understanding the basic concepts of Mechatronics and its
		applications.
	CO-2	Understanding the concepts of Electronic Interface
		Subsystems.
	CO-3	Applying the techniques of signal conditioning.
	CO-4	Analyzing various actuation systems.
	CO-5	Analyzing various electromechanical drives.
EHM832	CO-1	Understanding basic and modern concepts of quality and
		TQM.

	CO-2	Understanding importance of human factor in quality
	CO-3	Understanding the concept of TPM and six sigma along with
		their applications.
	CO-4	Applying quality control techniques like control charts, 7 QC
		and 7 New QC tools.
	CO-5	Analyzing quality related costs.
EME814	CO-1	Understanding the concepts of design and development
		products.
	CO-2	Applying the steps of product planning and value engineering.
	CO-3	Analyzing tool and techniques for product development and
		value engineering job plan.
	CO-4	Evaluating methods for material selection for the
		development of product.
	CO-5	Evaluating function, worth and value of products.
EME816	CO-1	Understanding principles and practices of maintenance
		planning
	CO-2	Applying policies of preventive maintenance.
	CO-3	Applying methods of condition monitoring
	CO-4	Analyzing repair methods for basic machine elements.
	CO-5	Analyzing repair methods for material handling equipments.
EME862	CO-1	Understanding the limitations of conventional/traditional
		Manufacturing Processes.
	CO-2	Applying the best suitable machining process for a workpiece
		based on its material properties.
	CO-3	Analyzing working principles and processing characteristics of
		ultra- precision machining processes.
	CO-4	Evaluating the precision using high-speed machining methods,
		and Nontraditional machining to the production of precision
		components.
	CO-5	Creating an in depth approach regarding application of
		unconventional Manufacturing processes for industrial
		production.
EME863	CO-1	Understanding the principles of sensors, actuators,
		thermocouple etc. Used in the Mechatronics system.
	CO-2	Applying the principles to make relationship between
		mechanical, Electronics, control and computer engineering.
	CO-3	Analyzing the electrical and mechanical systems and their
		Interconnection in real time.
	CO-4	Evaluating a system by interfacing with automation devices
		for a set of specifications.
	CO-5	Creating a model with complete design, building, interfacing
		and Actuation of a Mechatronics system using PLC
		programming.