

Mar Ephraem

College of Engineering & Technology

(NAAC Accredited Institution)
Run by Catholic Diocese of Marthandam

Approved by AICTE

Affiliated To Anna University, Chennai, Accredited by NAAC
Malankara Hills, Elavuvilai, Marthandam – 629 171, Kanyakumari District, Tamil Nadu
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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOME

ANNA UNIVERSITY REGULATION 2013

Y e a r	Se me ste r	Theo ry/ Prac tical	Co de	Subject Name		COURSE OUTCOME
					1	Interpret various visual materials (line graphs, pie charts etc.)
					2	Use the electronic media (internet) for email communication
			HS	Technical English – I	3	Describe various processes using sequence words
			615	reclamear English – I	4	Comprehend different spoken discourses/excerpts
			1		-	Write cohesively and coherently and flawlessly avoiding
					5	grammatical errors,
					1	Find inverse of a matrix using Cayley Hamilton theorem
			M A6 151	Mathematics – I	2	and multiple integration technique
					3	Use a wide vocabulary range to organize the ideas logically on a topic
1					4	Find the unknown parameter of the given problem which formulated in term of derivative
	1	Theo			5	Find the radius of curvature of any curve.
		гу			6	To check the convergency of the given series using different test.
				Engineering Physics –	1	Calculate the packing factor in crystalline structures
					2	choose appropriate material for manufacturing automobile parts, power plants, engines based on their modulus of all at the control of the con
			РН		3	Select proper material for heat exchangers, boilers, evaproters, compressors based on their thermal behavior.
			615	1	4	Analyse the dual nature of electrons in SEM, TEM, STEM
			1		5	ships, automobile parts aircrafts
					6	Demonstrate fibre optic sensors used for sensing temperature and pressure variation in pipelines, boilers, oil tanks.
			OF EI	NG		O The state of the

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[V	Se	The				
e a r		ry/	Code	Subject Name		COURSE OUTCOME
					1	Recognize the right type of polymer in designing.
					2	Apply various energy transformations principle in systems
			CVICIO	Engineering	3	Analyze compounds spectroanalytically
			CY6151	Chemistry – I	4	Analyze defects in structures using spectroanalytical methods
			V		5	Choose appropriate alloys in manufacturing.
					6	Select proper nanomaterial in manufacturing technology
						startatearing reciniology.
					1	Describe the functions of a digital computer with its organization
				Computer	2	Apply appropriate algorithm to solve the problem
					3	Analyse the different conditional constructs to solve simple
			GE6151	Programming	4	scientific and statistical problems
				S	5	Analyse the usage of functions and pointers
					3	Solve the program using arrays and strings
					6	Apply the concept of structures and unions in writing C programs.
					1	Draw the free hand sketching
				Engineering Graphics	2	Draw the special curves
			GE6152		3	Draw the Isometric and Perspective Projection
			0.50152		4	Draw the Development of Surfaces
					5	Draw the Solids and Section of Solids
			Marie Control		6	Draw the Points, Lines and Planes
			GE6161	Computer Practices Laboratory	1	Choose appropriate office automation tool to solve the problem
					2	apply good programming design methods for program
						development.
					3	Design and implement C programs for simple applications.
1		Prac			233.65	Solve problems using String functions
1	1	tical		Aurilla (S. 19)	5	Create and Implement the C programs with the help of structures and unions.
				ACCES TO BUSY BY		Fabricate carpentary parts
			(e) the second	Engineering	2	Demonstrate plumbing work
		11 3/1	GE6162	Practices	3	Demonstrate sheet metal work
		13/16		Laboratory	4	Demonstrate electrical circuit connections
			Manager State		5	Demonstrate soldering joints
					1	create reports & curriculum vitae
	73.0				2 1	use active & passive sentences
			HS6251	Technical	3 1	produce different types of writing such as porretion.
1	2	Theo	1130231	English – II		P and diguillent
	7	ry			4 8	analyse and evaluate the implied meanings of various texts
					Charles III	write influtes of meeting
			MACOSI	Mathematics -	0 0	demonstrate the skill of skimming & scanning
			ENGINE -	П	1 t	ime invariant systems
	1/4	GEOF	- INCEF	NA CANA	2521	ON ON
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1	30	TAMIL	NADU, INDIA	04/		
1	OLE	GE OF MALAN EL	MA6251 ENGINES KARA HILLS AVUVILAI NDAM - 829 17 MARI DISTRIC NADU, INDIA	Mathematics – II	4 a 5 v 6 c 1	

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		2	Find complex integration using cauchy's residue theorem and
			cauchy's integral formula
		3	conformal mapping.
		4	transform any function from one domain to another domain using bilinear transformation
		5	calculate line integral, surface integral and volume integral for the given curve
		6	20 20 10 10 10 10 10 10 10 10 10 10 10 10 10
		1	choose proper conducting material used for heating elements, coils, electrical machines.
		2	Calculate the carrier concentration for semi conducting materials.
		3	select suitable magnetic material in the production of gyrator, motors, electric cars, MRI.
PH6251	Engineering Physics – II	4	Apply super conducting phenomenon in the manufacturing of SQUID, MAG LEV train, switching devices.
		5	Use proper dielectric material for manufacturing of high voltage transformer, circuit breakers, servo motors.
		6	Analyse different synthesis technique in the preparation of nano materials.
			A CONTROL OF THE PROPERTY OF T
		1	Analyse the importance of water technology in the purification of water and its domestic and industrial demands.
		2	Explain the principles of electrochemistry and corrosion and their practical applicability.
		3	Understand the fundamentals of different alternative sources of energy and their importance to the mankind.
CY6251	Engineering	4	Classify the types of battery
	Chemistry – II	-	Analyse the different types of engineering materials and their
		5	applications in daily life.
		6	Understand the industrial techniques of petroleum processing and determination of various parameters associated with combustion processes
		MAG	APPENDING TO THE PROPERTY OF T
		1	Describe electric circuits and working principles of electrical machines
	D	2	describe concepts of various electronic devices
GE6252	Basic Electrical and Electronics	3	Choose appropriate instruments for electrical measurement for a specific application
	Engineering	4	Describe various semiconductor devices
		5	Describe various types of transformer
		6	Classify varions electronic measuring devices
		1	Illustrate the vectorial and scalar representation of forces and moments
GE6253	Engineering	2	Analyse the rigid body in equilibrium condition.
	Mechanics	3	Evaluate the properties of surfaces and solids
		4	Calculate dynamic forces exerted in rigid body
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1	1:	1	1	1	15	Determine the friction and the effects by the laws of friction
					6	
				Computer	1 2	Apply drawing practices, limits, fits and tolerances
			GE6261	Aided Drafting	-	part and wing for inaction components
			GEOZOI	and Modeling	3	part art wing for machanical components
				Laboratory	4	- Tarr Sectional Tiews
		P			5	Draw assembly drawings
1	2	Prac tical			1	Evaluate the quantitative chemical analysis of hardness, alkalinity and copper ion.
			GE6262	Physics and Chemistry	2	Evaluate the iron content of the given solution using potentiometer
				Laboratory -II	3	Evaluate the determination of Bacl2 and sodium using conductivity meter
					4	Describe optics, thermal physics,
					5	Evaluate engineering properties of materials.
			MA6351	Transforms and Partial Differential Equations	1	Develop partial differential equations for any provided equations
					2	Solve various types of partial differential equations
					3	Solve one dimensional wave equations and heat equations using fourier series
					4	Transform aperiodic function from one domain to another domain using Fourier transform method.
					5	Transform periodic function into sum of sine and cosine series
					6	Solve difference equations using Z-Transform.
						Transform
					1	Compute stress, strain and deformation of simple and compound bars
					2	Compute shear force and bending moment in beams subjected to transverse loading.
2	3	Theo			3	Compute shear stress due to torsion in shafts and helical springs.
		ry	CE6306	Strength of	4	Calculate the slope and deflection in beams using different methods.
				Materials	5	Compute stress and deformation in thin, thick cylinders and spherical shells.
					6	Calculate stress distribution due to shearing force and bending moment.
						the Mary State of the Control of the
			GROSSIAN AND AND AND AND AND AND AND AND AND A			Apply firstlaw of thermodynamics for simple open and closed systems under steady and unsteady conditions.
				Engineering Thermodynamic	2	Apply second law of thermodynamics to open and closed systems
				S	3	Apply rankine cycle for steam power plant and compare few cycle improvement methods.
						Derive simple thermodynamic relations of ideal and real gases
		1/10	FENGINE	ERIA	3612	dear and rear gases

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	1				5	Calculate the properties of gas mixtures and moist air in
					6	Compute entropy and available energy of a source and finite
						body using second law of thermodynamics
					2	Compute the properties and characteristics of fluids Calculate the major and minor losses of fluid flow through pipes.
				Fluid	3	Apply dimensional analysis using Bucking ham Pi theorem for a
			ODELEL			system.
			CE6451	Mechanics and Machinery	4	Compute the performance characteristics of pumps
				Wachinery	6	Compute the performance characteristics of turbines
					0	Predict the nature of physical quantities using model analysis.
					1	Explain different metal casting processes
				Manufacturing Technology -I	2	Compare various metal joining processes.
			ME6302		3	Illustrate various hot working and cold working methods of metals.
					4	Explain various sheet metal making processes.
					5	Distinguish various methods of manufacturing plastic components.
					6	Describe the various defects in metal joining and forming process
				Electrical Drives and Controls	1	Describe the basic components of electrical drives
					2	Apply the motor characteristics to select suitable drives
			EE6351		3	Explain the different types of electric braking system
					4	Describe the different types of starting methods used in electrical drives
					5	Explain the different types of speed controllers used in AC motors
					6	Describe the types of speed controllers used to control DC motors
					1	Demonstrate the taper turning operation in lathe
1 3				Manufacturing	3	Demonstrate thread cutting operation in lathe
			ME6311	Technology	4	Demonstrate eccentricity turning operation in a lathe.
				Laboratory -I	5	Demonstrate square head using shaper machine Demonstrate Hexagonal head shaping in shaping and milling machine.
2	3	Prac tical		Fluid	1	Calculate the coefficient of discharge for Orifice meter and Venturimeter
			CE6461	Mechanics and	2	Calculate the rate of flow using Rotometer
		1		Machinery	3	Perform performance Test on different turbines
				Laboratory	4	Perform performance Test of reciprocating pump and gear pump.
				Electrical	5	Determine the friction factor for a given set of pipes
		EGE	OF ENC	Engineering	1	Perform the load test, OCC, load characteristics and speed control of DC shunt and DC series machines
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				Laboratory	1.	Perform the load test, OC and SC test on a single phase
					2	transformer
					3	Evaluate the regulation of an alternator by EMF and MMF method
					4	Perform the load test and speed control on various types of induction motor
					5	Demonstrate the working of DC and AC starters
					1	Apply the concept of testing of hypothesis for small and large samples
					2	Apply the basic concepts of DOE in Engineering problems
			MAGIES	Statistics and Numerical	3	Apply the numerical techniques of differentiation and integration for Engineering problems.
			MA6452	Methods	4	Apply the numerical techniques for solving first and second order ordinary differential equations.
					5	Solve the partial and ordinary differential equations with initial and boundary conditions
					6	Calculate the eigen values of matrix by power method
			ME6401	Kinematics of Machinery	1	Discuss the basics of mechanism in machines
					2	Calculate displacement, velocity and acceleration in simple mechanisms
					3	Develop cam profiles for SHM, parabolic, Uniform Velocity and Cycloidal motion
					4	Solve basic problems in gear and gear train mechanism
					5	Calculate friction in various machine elements
					6	Apply the fundamentals of mechanism for the design of new mechanisms.
		Thee		Manufacturing Technology- II	1	Explain the mechanism of material removal processes
2	4	Theo			2	Describe the constructional and operational features of centre lathe and other special purpose lathes.
					3	Describe the constructional and operational features of shaper, planner, milling, drilling, sawing and broaching machines
			ME6402		4	Explain the types of grinding and gear manufacturing processes
				recimiology if	5	Develop part programs for NC machines
					6	Compare the functions and applications of different metal cutting tools
					1	Explain alloys and phase diagram, Iron-Iron Carbon diagram and steel classification
					2	Describe the effect of heat treatment processes.
				Engineering	3	Explain the effect of alloying elements on ferrous and non- ferrous metals
			ME6403	Materials and Metallurgy	4	Summarize the properties and applications of non metallic materials.
	12.5				5	Explain the types of mechanical testing.
					6	Describe fatigue and creep failure mechanisms
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			GE6351	Environmental Science and Engineering	1 2 3 4 5 6	Explain the nature and fact about environment, ecosystem and biodiversity Interpret the causes and apply the relevant control measures of pollution Describe energy resource and the importance of renewable and non-renewable resources. Explain forest resource, water resource, mineral resource, food resource, energy resource and land resource of environment Explain the social issues and legislative act on environment Explain the role of individual in conservation of natural resources Compute mean effective pressure and air standard efficiency
			ME6404	Thermal Engineering	1 2 3 4 5 6	using thermodynamic concepts for different air standard cycles Explain the functioning and features of IC engines, components and auxiliaries Compute the maximum condition of flow of steam through nozzle and turbine Calculate work of compression with and without clearance in single stage and multistage air compressors Calculate Performance parameters and Cooling Load in refrigeration and air conditioning system Calculate Performance parameters in IC engines
			ME6411	Manufacturing Technology Laboratory–II	1 2 3 4 5	Demonstrate contour milling and generate a spur gear from a cylindrical work piece Perform helical gear cutting operation and generate gear using hobbing machine Demonstrate plain surface grinding operation Demonstrate cylindrical grinding and tool and Cutter Grinder Measure cutting forces in Milling / Turning Process and develop CNC part programming
2	4	Prac tical	ME6412	Thermal Engineering Laboratory -I	1 2 3 4 5	Draw the valve timing and port timing diagram for single cylinder four stroke diesel engine and two stroke petrol engine Calculate the mechanical efficiency of four stroke SI engine by Morse test Compute the performance of four stroke single cylinder CI engine & Predict actual diagram. Calculate the performance of steam generator and steam turbines Compute the flash and fire point of various fuel/lubricants.
			CE6315	Strength of Materials Laboratory	1 2 3 4 5	Compute the yield stress, breaking stress and ultimate stress of the given specimen under tension test Conduct the torsion test and deflection test on solid materials Perform Hardness test and findout the hardness number of Solid materials. Compute the stiffness of the open coil and closed coil spring Compute the impact strength of given specimen using Izod Impact testing machine.
3	5	Theo	ME6501 OF ENGINE	Computer	1	Explain product cycle, design process, sequential and concurrent

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	Aided Design		engineering in design process.
		2	Explain the fundamentals of parametric curves, surfaces and Solids
		3	Illustrate the algorithms for visual realism
		4	Explain the fundamentals of assembly of parts
		5	Summarize the different types of graphic standards used in CAD
		6	Describe 2D, 3D transformations of computer graphics
		1	Apply heat conduction equations to different surface configurations under steady state and transient conditions
		2	Apply free and forced convective heat transfer correlations to internal and external flows through/over various surface configurations
ME6502	Heat and Mass Transfer	3	Apply LMTD and NTU methods of thermal analysis to different types of heat exchanger configurations
		4	Describe the phenomena of boiling and condensation
		5	Apply the basic laws for Radiation in heat transfer between different types of surfaces
		6	Apply diffusive and convective mass transfer equations and correlations in steady state molecular diffusion
		1	Apply the concepts of steady and variable stresses in machine component design
		2	Apply the concepts of design to shafts, keys and couplings
	Design of	3	Apply the concepts of design to temporary and permanent joints.
ME6503	Machine Elements	4	Apply the concepts of design to energy absorbing members, connecting rod and crank shaft.
		5	Apply the concepts of design to bearings
		6	Explain the various theory of failures used in machine component design.
		1	Describe the basic principles of instrumentation and metrology
		2	Illustrate the different types of linear and angular measurements.
		3	Describe the laser principles in advanced metrology
ME6504	Metrology and Measurements	4	Explain the techniques of form measurements in industrial components
	Measurements	5	Describe measuring methods of power, flow and temperature
		6	Explain the procedures for conducting computer aided measurements
		1	Calculate static and dynamic forces of mechanisms.
		2	Calculate the balancing masses and their locations of
			reciprocating and rotating masses.
	Dynamics of	3	Compute the frequency of free vibration.
ME6505	Machines of Machines	4	Compute the frequency of forced vibration and damping coefficient.
		5	Calculate the speed and lift of governors
ENGINEE		6	Compute the gyroscopic couple on automobiles, ships and airplanes

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1	1	1			111	Explain the importance of human values and ethics
					2	Describe the theories in engineering ethics
			CDC035	Professional	3	Apply the ethical theories in Engineering projects
			GE6075	Ethics in	4	Differentiate the safety and risk factors in the society
				Engineering	5	Discuss the global ethical issues related to Engineering
					6	Explain the responsibility and rights of Engineer in the society
					0	Demonstrate the principles of kinematics in various types of
					1	gears, gear trains, mechanisms and universal joints
					2	Compute the mass moment of inertia of axisymmetric objects using Turn table apparatus, bi-filar suspension, compound
			ME6511	Dynamics Laboratory	3	pendulum and fly wheel and axle system Compute the natural frequency and damping coofficient, torsional frequency, critical speed of shaft under the given load
				Datoratory		conditions and the gyroscopic couple
					4	Perform characteristic test of Watt, Porter, Proell and Hartnell governors
					5	Demonstrate the balancing of rotating masses in dynamic balancing machine
				Thermal Engineering Laboratory-II	1	Calculate the thermal conductivity of various Engineering materials
3 5	5	Prac tical			2	Compute heat transfer rate in free and forced convection environment
					3	Compute emissivity of grey surface
					4	Calculate the effectiveness of parallel and counter flow heat exchanger
					5	Calculate the performance of refrigeration, air conditioning system, air compressor and fluidized bed cooling tower
			ME6513	Metrology and Measurements Laboratory	1	Measure the temperature, force, torque using relevant sensors.
					2	Measure the dimensions, angularity and parallelism of a given component
					3	Calibrate the vernier, micrometer and vernier height guage using gauge blocks
					4	Measure the gear tooth dimensions and threaded parameters using profile projector
					5	Measurement of angles using bevel protractor and sine bar
					1	Apply the concepts of design to belts, chains and rope drives
					2	Apply the concepts of design to spur, helical gears
) FECCOL	Design of	3	Apply the concepts of design to worm and bevel gears.
			ME6601	Transmission	4	Apply the concepts of design to gear boxes
				Systems	5	Apply the concepts of design to cams, brakes
2	6	Theo			6	Apply the concepts of design to clutches
3	6	ry	\$100 BAA		1	Explain the management functions of an organization
	le pas				2	Describe the planning tools and techniques in the organization
			MCCOSI	Principles of	3	Explain the functions of human resource management
			MG6851	Management	4	Describe the leadership and motivation theories of an organization
		FE	MGINEE		5	Classify budgetary and non-budgetary controlling techniques
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					6	Describe the leadership qualities of a Manager in an organization.
					1	Explain the various parts of automobiles with their functions and materials
					2	Describe the engine auxillary system and engine emission control
			ME6602	Automobile	3	Distinguish the working of different types of transmission system
			WEGGG	Engineering	4	Explain the steering, brake and suspension system
					5	Explain the various alternate fuels used in automobiles
					6	Explain vehicle aerodynamics and traction control
				Finite Element Analysis	1	Summarize the basics of finite element formulation
					2	Apply finite element methods to solve one dimensional problems
			ME6603		3	Apply finite element methods to solve two-dimensional Scalar Problems
					4	Apply finite element methods to solve two-dimensional Vector problems
					5	Apply finite element methods to solve problems on isoparametric elements.
					6	Solve basic Dynamic problems using Finite element methods
				Gas Dynamics and Jet Propulsion	1	Apply the concept of compressible flow in constant area duct
					2	Compute static and stagnation properties of Rayleigh and Fanno flow in constant area duct
			ME6604		3	Examine the effect of compression and expansion waves in compressible flow
					4	Apply the concepts of gas dynamics in jet propulsion
					5	Apply the basic concepts of gas dynamics in space propulsion
					6	Apply the concept of compressible flow in variable area duct
					1	Create 2D models using modeling softwares
					2	Create 3D models using modeling softwares
				C.A.D. /	3	Demonstrate basic operations in CNC milling machines
			ME6611	C.A.M.	4	Demonstrate the basic operations in CNC turning machines
				Laboratory	5	Simulate turning and milling operations using cam softwares
		Dross				School State (Section Section
3	6	Prac tical			1	Design the machine components or product based on specification
				Design and	2	Fabricate the machine components or product based on the design
			ME6612	Fabrication Project	3	Demonstrate the working model of the completed mechanical product.
					4	Manage projects through work plan and detailed budgets.
					5	Present their finding Orally to the review committee
		0	ENGINER		6	Contribute effectively as individual and team member
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					11	Listen and respond appropriately
				Communication	2	Participate in group discussion
				and Soft Skills-	3	Read and evaluate text critically
NE			GE6674	Laboratory	4	Write for media content on current events
				Based	1000	Communicate effectively with appropriate vocabulary and
					5	grammar
					1	Explain the layout, construction and working of the components of thermal power plant.
					2	Explain the layout, construction and working of the components of Diesel, Gas and Combined cycle power plants.
			ME6701	Power Plant Engineering	3	Explainthe layout, construction and working of the components of nuclear power plants.
					4	Explain the layout, construction and working of the components of renewable enery power plants
1		CHAR			5	Describe the economic and environmental issues on power plants
1					6	Estimate the cost of electrical energy production in power plants
			ME6702	Mechatronics	1	Discuss the interdiciplinary applications of electronics, electrical, mechanical and computer systems
		Theo ry			2	Explain the architecture of 8085 microprocessor and 8051 microcontroller
					3	Explain the Programmable Peripheral Interface and Architecture of 8255 PPI
	7				4	Describe the architecture, programming and application of programmable logic controller.
4					5	Explain the types of motors and actuators in mechatronics system
					6	Describe the structure and operation of pick and place robot
				Computer Integrated Manufacturing	1	Explain the basic concept of CAD/CAM in computer integrated manufacturing
					2	Illustrate the use of computers in process planning
			ME6703		3	Diffentiate the different coding system used in Group Technology
				Systems	4	Explain the concept of FMS and AGVs
					5	Classify the robots used in Industrial application
					6	Solve quantitative analysis in cellular manufacturing using ROC Algorithm
					1	Describe the needs and basic concepts of TQM
		GENERAL S			2	Apply the TQM principles and concepts in business
			GE6757	Total Quality	3	Apply Benchmarking techniques in quality management processes
				Management	4	Explain the concepts of Six Sigma
			10 July 10 Jul		5	Describe the quality systems and standards in the organisations.
				CAMPACE SE	6	Describe the concepts of total productive maintenance
		Dress		Simulation and	1,	Analyze stresses and strains induced in plates, brackets and beams using finite element software
4	4 7	Prac tical	ME6711	Analysis Laboratory	2	Calculate natural frequency of 2D components and beams using finite element software
		1208	OF Erry		3	Demonstrate basic harmonic analysis in beams

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					4	Analyse stresses in basic cylindrical shell problems.
					5	Compute the natural frequency of simple spring mass systems.
					1	Develop programs for arithmetic functions,,sorting and code conversion functions
			ME6712		2	Develop program codes to interface traffic light controller and stepper motor, speed control of DC motor
				Mechatronics Laboratory	3	Demostrate the hydraulic, pneumatic, electro pneumatic and PLC circuits
					4	Modeling and analysis of the hydraulic and pneumatic using simulation software
					5	Compute the dimensions of given geometry using image processing techniques
					1	Comprehend any problem related to basic science
			ME6713		2	Comprehend any problem related to thermal science
4	8	Prac tical		Comprehension	3	Comprehend any problem related to manufacturing
					4	Comprehend any problem related to design
					5	Comprehend any problem related to industrial engineering and maintenance
				Engineering Economics	1	Explain the basic concepts of Economics and different types of costs.
					2	Describe value engineering procedures
4	8	Theo	MG6863		3	Differentiate Cash Dominated and Revenue Dominated Cash flow.
					4	Explain the principles of Replacement and Maintenance analysis.
					5	Compute depreciation of products.
					6	Determine the economic life of an asset.
					1	Identify a specific Engineering problem from the context of societal issues
					2	Provide eco-friendly solution for the identified problem
					3	Design and development of systems and models for the solution of identified problem
4	8	Prac tical	ME6811	Project Work	4	Conduct experiments for the developed solutions with the aid of modern tools.
		UCAI			5	Interpret and disscuss the results
			6	provide valid conclusions for the obtained results		
					7	Manage projects through work plan and detailed budgets.
					8	Present their finding Orally to the review committee
1					9	Contribute effectively as individual and team member





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