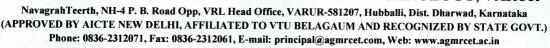
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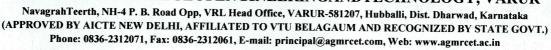
#### DEPARTMENT OF MECHANICAL ENGINEERING CO STATEMENT FOR THE SCHEME 2018 (BATCH 2018-2022)

SL.NO	SUB NAME	COs	CO Statement
		I SI	
		18MAT11.1	Apply the knowledge of calculus to problems related to polar curves and its applications in determining the bentness of the curve
	LNI IVELE Segundos d PERIOS d	18MAT11.2	Learn the lotion of partial differentiation to calculate rates of change of multivariate function and solve problems related to composite functions and jacobians
		18MAT11.3	Apply the concept of change of order of integration and variables to evaluate multiple integrates and their usage in computing the area and volumes
11 2	Calculus and Linear Algebra	18MAT11.4	Solve first order linear/nonlinear differential equations analytically using standard methods
		18MAT11.5	Make use of matrix theory for solving system of linear equations and compute Eigenvalues and Eigenvectors required for matrix diagonalization process
V-71	elegis fi fino elegis fi fino DEN 2015 Elegis fi fino	18PHY12.1	Learn and understand various types of oscillations and their implications. Recognize the significance of shock waves and its application in various fields
2	Engineering Physics	18PHY12.2	To get acquainted with elastic properties of materials by understanding the definition of elasticity, stress, strain, modulus of rigidity, young's modulus, bulk modulus and elastic limits
		18PHY12.3	To realize the inter relation between time varying electric field and magnetic field, Properties of EM waves, Maxwell's Equation and their role in Optical fiber communication
		18PHY12.4	Gain Knowledge of the intricacies of matter and

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#### DEPARTMENT OF MECHANICAL ENGINEERING CO STATEMENT FOR THE SCHEME 2018 (BATCH 2018-2022)

			energy, which is essential to explore the role of subatomic particles in understanding the matter at macro, micro and Nano level using the principles of quantum mechanics and understand the physics of lasers, various types of lasers and to appreciate their role in modern technology.
		18PHY12.5	Learn the niceties of technologically important materials such as conductor, semiconductor and dielectrics, their potential properties in understanding there use in engineering applications
	-9-27-6	18ELE13.1	Students will be able to comphrehend the basic concept of AC and DC circuits
	Basic Electrical Engineering	18ELE13.2	Explain the working principle of AC and DC circuits
3		18ELE13.3	Explain the working principle of construction of Transformer
		18ELE13.4	Understand the basic concepts of wiring,earthing, Domestic protection device and electric shock
		18CIV14.1	Mention the applications of various fields of Civil Engineering
		18CIV14.2	Compute the resultant of given force system subjected to various loads
4	Elements of Civil Engineering and Mechanics	18CIV14.3	Comprehend the action of forces, moments and other loads on the system of rigid bodies and compute the reactive forces that develop as a result of external bodies
		18CIV14.4	Locate the centroid and compute the moment of Inertia of regular and buildup section
		18CIV14.5	Express the relationship between motion of bodies and analyze the bodies in motion
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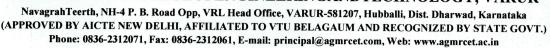
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		18EGDL15.1	Prepare Engineering drawing as per BIS conventions mentioned in the relevant codes.
		18EGDL15.2	Produce computer generated drawings using CAED software
5	Engineering Graphics	18EGDL15.3	Use the knowledge of orthographic projections to represent engineering concepts and present the same in the form of drawings.
		18EGDL15.4	Develop isometric drawings of simple objects reading the orthographic projections of those objects.
		18EGDL15.5	Convert pictorial and isometric views of obejcts to orthographic views.
		18PHYL16.1	To recognize the light by exploring its interactions with matter and in realizing its characteristic properties
	Engineering Physics laboratory	18PHYL16.2	Understanding the mechanical properties of the material by application of stress
6		18PHYL16.3	Appreciating the significance of elementary electric circuits in the functioning of various electric electronic devices and gaining understanding of physics of the materials
		18PHYL16.4	Design and implementation of electronic circuits to gain better understanding of physics is semiconductor devices
		18PHYL16.5	Appreciating the role of quantum mechanics i exploring the electrical properties of the materials
		18ELE17.1	Determine the current, power drawn and comparin the power factor of different lamps
7	Basic Electrical Engineering Laboratory	18ELE17.2	Determine impedance of an electrical circuit are power consumed in 3phase load
		18ELE17.3	Determine the earth resistance and understand the

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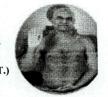
#### DEPARTMENT OF MECHANICAL ENGINEERING CO STATEMENT FOR THE SCHEME 2018 (BATCH 2018-2022)

			2way and 3 way control of lamp
		18ELE17.4	Understand the basic functioning of domestic appliances of like fuse, MCB, UPS
		II SI	EM
		18MAT21.1	Illustrate the applications of multivariate calculus to understand the solenoidal and irrotational vectors and also exhibit the interdependence of line surface and volume integrals
	Advanced Calculus	18MAT21.2	Emonstrate the various physical model through higher order differential equations and solve such higher orderndefferential equations
8	and Numerical Methods	18MAT21.3	Construct a variety of partial differential equations and solve the linear differential equations
		18MAT21.4	Explain the applications of differential equations and solution of ordinary differential equations
		18MAT21.5	Apply the knowledge of numerical methods in the modeling of various physical and engineering phenomena
		18CHE22.1	Use of free energy in equilibria, rationalize bulk properties and processes using the thermodynamic consideration, electrochemical energy systems
9	Engineering Chemistry	18CHE22.2	Causes and effect of corrosion of metals and control of corrosions. Modification of surface properties of metals to develop resistance to corrosion wear, tear impact et by electro plating and electroless plating
		18CHE22.3	Production and consumption of energy for industrialization of country and living standard of people. Electrochemical and concentration of cells. Classical modern batteris and fuel cells. Utilization of solar energy for different useful forms of energy
		18CHE22.4	Environmental pollution, waste management and

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			water chemistry.
		18CHE22.5	Different techniques of instrumental methods of analysis. Fundamental principles of Nan materials.
		18CPS23.1	Illustrate simple algorithms from the different domains such as mathematic, physics etc.
	a n	18CPS23.2	Construct a programming solutions to the given problems using C
10	C-Programming for problem Solving	18CPS23.3	Identify and Correct the syntax and logical errors in C programming
		18CPS23.4	Modularize the given problems using functions and structures
	Basic Electronics	18ELN24.1	Describe the operations of diodes,BJT,FET an Operational Amplifiers.
		18ELN24.2	Design and explain the constructions of rectfier ,regulators,amplifiers and oscillators.
		18ELN24.3	Describe general operating principles of SCR are its applications
11		18ELN24.4	Explain the working and design of Fixed volatage IC regulators using 7805 and astable oscillate using timer IC 555
		18ELN24.5	Explain different number system and the conversions and construct simple combinational ar sequential logic circuits using Flip-Fliops.
		18ELN24.6	Describe the basic principles of operation communication systemand mobile phones
12	Elements of	18ME25.1	Identify different sources of energy and the conversion process
	Mechanical Engineering	18ME25.2	Explain the working principles of Hydrau turbines, pumps, IC engines and refrigirators

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		18ME25.3	Recognize various metal joining process and power transmission elements
		18ME25.4	Understand the properties of common engineering materials and their applications in engineering industry
		18ME25.5	Discuss the working of conventional machine tools, machining process and accessories.
		18ME25.6	Describe the advanced manufacturing systems
		18CHEL26.1	Handling different types of instruments for analysis of materials using small quantities of materials involved in quick and accurate results
13	Engineering Chemistry Laboratory	18CHEL26.2	Carrying out different types of titrations for estimation of concerned in materials using comparatively more quantity of materials involved for good results
	C-Programming Laboratory	18CPL27.1	Write algorithms ,flowcharts and program for simple problems
		18CPL27.2	Correct the syntax and logical errors to execute program
14		18CPL27.3	Write iterative and wherever possible recursive programs
		18CPL27.4	Demonstrate use of functions, arrays, strings strictures and pointers in problem solving.
		III S	
15	Transform Calculus, Fourier Series and Numerical Techniques	18MAT31.1	Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering.
		18MAT31.2	Demonstrate Fourier series to study the behavior of periodic functions and their applications in system communications, digital signal processing and fie theory.

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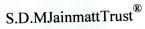


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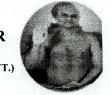
	A REAL PROPERTY OF THE PROPERT		CD : 4 C 1 7 transferme to
		18MAT31.3	Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems.
		18MAT31.4	Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods.
		18MAT31.5	Determine the extremals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis
		18ME32.1	Understand simple, compound, thermal stresses and strains their relations and strain energy.
		18ME32.2	Analyse structural members for stresses, strains and deformations
16	MECHANICS OF MATERIALS	18ME32.3	Analyse the structural members subjected to bending and shear loads.
		18ME32.4	Analyse shafts subjected to twisting loads
		18ME32.5	Analyse the short columns for stability.
		18ME33.1	Explain fundamentals of thermodynamics and evaluate energy interactions across the boundary of thermodynamic systems.
		18ME33.2	Evaluate the feasibility of cyclic and non-cyclic processes using 2nd law of thermodynamics.
17	BASIC THERMODYNAMICS	18ME33.3	Apply the knowledge of entropy, reversibility and irreversibility to solve numerical problems and apply 1st law of thermodynamics to closed and open systems and determine quantity of energy transfers and change in properties.
		18ME33.4	Interpret the behavior of pure substances and its application in practical problems.
		18ME33.5	Recognize differences between ideal and real gases and evaluate thermodynamic properties of ideal and real gas mixtures using various relations.

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		18ME34.1	Understand the mechanical properties of metals and their alloys.
18		18ME34.2	Analyze the various modes of failure and understand the microstructures of ferrous and nonferrous materials.
	MATERIAL SCIENCE	18ME34.3	Describe the processes of heat treatment of various alloys.
	SCIENCE	18ME34.4	Acquire the Knowledge of composite materials and their production process as well as applications.
		18ME34.5	Understand the properties and potentialities of various materials available and material selection procedures.
	METAL CUTTING AND FORMING	18ME35A/45A.1	Explain the construction & specification of various machine tools.
		18ME35A/45A.2	Discuss different cutting tool materials, too nomenclature & surface finish.
		18ME35A/45A.3	Apply mechanics of machining process to evaluat machining time.
19		18ME35A/45A.4	Analyze tool wear mechanisms and equations t enhance tool life and minimize machining cost.
		18ME35A/45A.5	Understand the concepts of different metal formin processes.
		18ME35A/45A.6	Apply the concepts of design of sheet metal dies t design different dies for simple sheet metal components.
20		18ME35B/45B.1	Describe the casting process and prepare different types of cast products.
	METAL CASTING AND WELDING	18ME35B/45B.2	Acquire knowledge on Pattern, Core, Gating, Ris system and to use Jolt, Squeeze, Sand Slinger Moulding machines.

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		18ME35B/45B.3	Compare the Gas fired pit, Resistance, Coreless, Electrical and Cupola Metal Furnaces.
		18ME35B/45B.4	Compare the Gravity, Pressure die, Centrifugal, Squeeze, slush and Continuous Metal mold castings.
		18ME35B/45B.5	Understand the Solidification process and Casting of Non-Ferrous Metals.
		18ME35B/45B.6	Describe the Metal Arc, TIG, MIG, Submerged and Atomic Hydrogen Welding processes etc. used in manufacturing.
		18ME35B/45B.7	CO7: Describe methods for the quality assurance of components made of casting and joining process
		18ME36A/46A.1	Identify the national and international standards pertaining to machine drawing.
		18ME36A/46A.2	Understand the importance of the linking functional and visualization aspects in the preparation of the part drawings
21	COMPUTER AIDED MACHINE DRAWING	18ME36A/46A.3	Apply limits and tolerances to assemblies and choose appropriate fits for given assemblies.
	DRAWING	18ME36A/46A.4	Interpret the Machining and surface finish symbols on the component drawings.
		18ME36A/46A.5	Preparation of the part or assembly drawings as per the conventions. Scheme of Examination: Two questions to be se from each Part A, part B and Part
	MECHANICAL	18ME36B/46B.1	Understand the objectives of metrology, methods of measurement, standards of measurement & various measurement parameters.
22	MEASUREMENTS AND METROLOGY	18ME36B/46B.2	Explain tolerance, limits of size, fits, geometric and position tolerances, gauges and their design
		18ME36B/46B.3	Understand the working principle of different types

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			of comparators.
		18ME36B/46B.4	Describe measurement of major & minor diameter, pitch, angle and effective diameter of screw threads.
		18ME36B/46B.5	Explain measurement systems, transducers intermediate modifying devices and terminating devices
		18ME36B/46B.6	Describe functioning of force, torque, pressure strain and temperature measuring devices.
		18MEL37A/47A.1	Acquire experimentation skills in the field o material testing.
		18MEL37A/47A.2	Develop theoretical understanding of th mechanical properties of materials by performing experiments.
23	MATERIAL TESTING LAB	18MEL37A/47A.3	Apply the knowledge to analyse a material failure and determine the failure inducing agent/s.
		18MEL37A/47A.4	Apply the knowledge of testing methods in relate areas.
		18MEL37A/47A.5	Understand how to improve structure/behaviour of materials for various industrial applications.
		18MEL37B/47B.1	Understand Calibration of pressure gauge thermocouple, LVDT, load cell, micrometre.
		18MEL37B/47B.2	Apply concepts of Measurement of angle using Sir Centre/ Sine Bar/ Bevel Protractor, alignment usin Autocollimator/ Roller set.
	MECHANICAL	18MEL37B/47B.3	Demonstrate measurements using Option Projector/Tool maker microscope, Optical flats.
24	MEASUREMENTS AND METROLOGY LAB	18MEL37B/47B.4	Analyse tool forces using Lathe/Drill to
		18MEL37B/47B.5	Analyse Screw thread parameters using 2-Wire 3-Wire method, gear tooth profile using gear tooth Vernier/Gear tooth micrometre
		18MEL37B/47B.6	Understand the concepts of measurement of surfaroughness.
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		18MEL38A/48A.1	To read working drawings, understand operational symbols and execute machining operations.
		18MEL38A/48A.2	Prepare fitting models according to drawings using hand tools- V-block, marking gauge, files, hack saw, drills etc.
	WORKSHOP AND	18MEL38A/48A.3	Understand integral parts of lathe, shaping and milling machines and various accessories and attachments used.
25	MACHINE SHOP PRACTICE	18MEL38A/48A.4	Select cutting parameters like cutting speed, feed depth of cut, and tooling for various machining operations.
		18MEL38A/48A.5	Perform cylindrical turning operations such as plain turning, taper turning, step turning, thread Cutting, facing, knurling, internal thread cutting eccentric turning and estimate cutting time.
		18MEL38A/48A.6	Perform machining operations such as plai shaping, inclined shaping, keyway cutting, Indexing
		18MEL38B/48B.1	Demonstrate various skills in preparation of molding sand for conducting tensile, shear and compression tests using Universal sand testin machine.
26	FOUNDRY, FORGING AND WELDING LAB	18MEL38B/48B.2	Demonstrate skills in determining permeability clay content and Grain Fineness Number of base sands.
		18MEL38B/48B.3	☐ Demonstrate skills in preparation of forgir models involving upsetting, drawing and bending operations.
	CONSTITUTION OF	18CPC39/49	Have constitutional knowledge and legal literacy.
27	INDIA, PROFESSIONAL	18CPC39/49	Understand Engineering and Professional ethics ar responsibilities of Engineers.
	ETHICS AND CYBER LAW (CPC)	18CPC39/49	Understand the the cybercrimes and cyber laws f cyber safety measures.
		18MATDIP31.1	Apply concepts of complex numbers and vect algebra to analyze the problems arising in related area.
28	ADDITIONAL	18MATDIP31.2	: Use derivatives and partial derivatives to calcular rate of change of multivariate functions.
	MATHEMATICS – I	18MATDIP31.3	Analyze position, velocity and acceleration in twand three dimensions of vector valued functions
		18MATDIP31.4	Learn techniques of integration including to evaluation of double and triple integrals.
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		18MATDIP31.5	Identify and solve first order ordinary differential equations.
		IV SE	M
	per de grant par la montantina de Control de la control de	18MAT41.1	Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory.
		18MAT41.2	Utilize conformal transformation and complex integral arising in aero foil theory, fluid flow visualization and image processing.
23	Engineering Mathematics-IV	18MAT41.3	Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field.
		18MAT41.4	Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data.
		18MAT41.5	Construct joint probability distributions and demonstrate the validity of testing the hypothesis.
	APPLIED THERMODYNAMICS	18ME42.1	Apply thermodynamic concepts to analyze the performance of gas power cycles.
		18ME42.2	Apply thermodynamic concepts to analyze the performance of vapour power cycles.
		18ME42.3	Understand combustion of fuels and performance of I C engines.
24		18ME42.4	Understand the principles and applications or refrigeration systems.
		18ME42.5	Apply Thermodynamic concepts to determine performance parameters of refrigeration and airconditioning systems.
		18ME42.6	Understand the working principle of A compressors and Steam nozzles, applications relevance of air and identify methods for performance improvement.

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		18ME51.4	Select the best economic model from various available alternatives
31	MANAGEMENT AND ECONOMICS	18ME51.3	Discuss Decision making, Organizing, Staffing, Directing and Controlling.
		18ME51.2	Understand importance, purpose of Planning and hierarchy of planning and also54nalyse its types
		18ME51.1	Understand needs, functions, roles, scope and evolution of Management
		VS	EM
		18ME44.6	Analyse the gear trains speed ratio and torque.
	KINEMATICS OF MACHINES	18ME44.5	Understand the working of the spur gears.
26		18ME44.4	Analysis of cam follower motion for the motion specifications.
		18ME44.3	Analyse the velocity, acceleration of links and joints of mechanisms.
		18ME44.2	Understand the inversions of four bar mechanisms.
		18ME44.1	Knowledge of mechanisms and their motion.
		18ME43.6	Illustrate and explain the basic concept of compressible flow and CFD
25		18ME43.5	Explain the concept of boundary layer in fluid flow and apply dimensional analysis to form dimensionless numbers in terms of input output variables.
	FLUID MECHANICS	18ME43.4	Describe the principles of fluid kinematics and dynamics.
		18ME43.3	Apply the knowledge of fluid statics, kinematics and dynamics while addressing problems of mechanical and chemical engineering.
		18ME43.2	Explain the principles of pressure, buoyancy and floatation
		18ME43.1	Identify and calculate the key fluid properties used in the analysis of fluid behavior.

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#### DEPARTMENT OF MECHANICAL ENGINEERING CO STATEMENT FOR THE SCHEME 2018 (BATCH 2018-2022)

		18ME51.5	Understand various interest rate methods and implement the suitable one.
		18ME51.6	Estimate various depreciation values of commodities.
		18ME51.7	Prepare the project reports effectively.
		18ME52.1	Apply the concepts of selection of materials for given mechanical components.
		18ME52.2	List the functions and uses of machine elements used in mechanical systems
	DESIGN OF MACHINE ELEMENTS I	18ME52.3	Apply codes and standards in the design of machine elements and select an element based on the Manufacturer's catalogue.
32		18ME52.4	Analyze the performance and failure modes of mechanical components subjected to combined loading and fatigue loading using the concepts
		18ME52.5	Demonstrate the application of engineering design tools to the design of machine components like of theories of failure.
		18ME52.6	Understand the art of working in a team.
	DYNAMICS OF	18ME53.1	Analyse the mechanisms for static and dynamic equilibrium.
		18ME53.2	Carry out the balancing of rotating and reciprocating masses
33		18ME53.3	Analyse different types of governors used in real life situation.
	MACHINES	18ME53.4	Analyse the gyroscopic effects on disks, airplanes, stability of ships, two and four wheelers
		18ME53.5	Understand the free and forced vibration phenomenon.

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		18ME53.6	Determine the natural frequency, force and motion transmitted in vibrating systems.
		18ME54.1	Model studies and thermodynamics analysis of turbomachines.
		18ME54.2	Analyse the energy transfer in Turbo machine with degree of reaction and utilisation factor.
	TURBO MACHINES	18ME54.3	Classify, analyse and understand various type of steam turbine.
33	Tokas	18ME54.4	Classify, analyse and understand various type of hydraulic turbine.
		18ME54.5	Understand the concept of radial power absorbing machine and the problems involved during its operation.
	FLUID POWER ENGINEERING	18ME55.1	Identify and analyse the functional requirements of a fluid power transmission system for a give application.
		18ME55.2	Visualize how a hydraulic/pneumatic circuit wi work to accomplish the function.
34		18ME55.3	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electrohydraulics, electropneumatics for a give application.
		18ME55.4	Select and size the different components of the circuit.
		18ME55.5	Develop a comprehensive circuit diagram be integrating the components selected for the given application.
		18ME56.1	Explain the concept and scope of operation management in a business context
35	OPERATIONS MANAGEMENT	18ME56.2	Recognize the role of Operations manageme among various business functions and its role theorganizations' strategic planning and gaining among titive advantage.
		18ME56.3	Analyze the appropriateness and applicability of range of operations management systems/mod

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			indecision making
		18ME56.4	Assess a range of strategies for improving the efficiency and effectiveness of organizational operations.
		18ME56.5	Evaluate a selection of frameworks used in the design and delivery of operations
		18MEL57.1	Perform experiments to determine the coefficient of discharge of flow measuring devices.
		18MEL57.2	Conduct experiments on hydraulic turbines and pumps to draw characteristics.
36	FLUID MECHANICS AND MACHINES	18MEL57.3	Test basic performance parameters of hydraulic turbines and pumps and execute the knowledge in real Life situations
50	LAB	18MEL57.4	Determine the energy flow pattern through the hydraulic turbines and pumps.
		18MEL57.5	Exhibit his competency towards preventive maintenance of hydraulic machines.
	ENERGY CONVERSION LABORATORY	18MEL58.1	Perform experiments to determine the properties of fuels and oils.
		18MEL58.2	Conduct experiments on engines and draw characteristics.
37		18MEL58.3	Test basic performance parameters of I.C. Engine and implement the knowledge in industry.
		18MEL58.4	Identify exhaust emission, factors affecting them and exhibit his competency towards preventive maintenance of IC engines
		18CIV59.1	Understand the principles of ecology and environmental issues that apply to air, land, and water issues on a global scale,
38	ENVIRONMENTAL STUDIES	18CIV59.2	Develop critical thinking and/or observation skills and apply them to the analysis of a problem or question related to the environment.
		18CIV59.3	Demonstrate ecology knowledge of a comple relationship between biotic and abiotic

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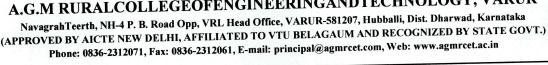
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T			components.
		18CIV59.4	Apply their ecological knowledge to illustrate and graph a problem and describe the realities that managers face when dealing with complex issues.
		VISI	CM
		18ME61.1	Identify the application and characteristics of FEA elements such as bars, beams, plane and isoparametric elements.
		18ME61.2	Develop element characteristic equation and generation of global equation.
38	FINITE ELEMENT METHODS	18ME61.3	Formulate and solve Axi-symmetric and heatransfer problems.
		18ME61.4	Apply suitable boundary conditions to a global equation for bars, trusses, beams, circular shafts heat transfer, fluid flow, axi-symmetric and dynamic problems
	DESIGN OF MACHINE ELEMENTS II	18ME62.1	Apply design principles for the design of mechanical systems involving springs, belt pulleys, and wire ropes.
		18ME62.2	Design different types of gears and simple gears boxes for relevant applications.
		18ME62.3	Understand the design principles of brakes ar clutches.
39		18ME62.4	Apply design concepts of hydrodynamic bearing for different applications and select Anti friction bearings for different applications using the manufacturers, catalogue.
		18ME62.5	Apply engineering design tools to product design.
		18ME62.6	Become good design engineers through learning t art of working in a team.
40	HEAT TRANSFER	18ME63.1	Understand the modes of heat transfer and apply to basic laws to formulate engineering systems.

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		18ME63.2	Understand and apply the basic laws of heat transfer to extended surface, composite material and unsteady state heat transfer problems.
		18ME63.3	Analyze heat conduction through numerical methods and apply the fundamental principle to solve radiation heat transfer problems.
		18ME63.4	Analyze heat transfer due to free and forced convective heat transfer.
		18ME63.5	Understand the design and performance analysis of heat exchangers and their practical applications, Condensation and Boiling phenomena.
		18ME641.1	Understand the compare traditional and non-traditional machining process and recognize the need for Non-traditional machining process.
		18ME641.2	Understand the constructional features, performance parameters, process characteristics, applications, advantages and limitations of USM, AJM and WIM
		18ME641.3	Identify the need of Chemical and electro-chemical machining process along with the constructional features, process parameters, process characteristics, applications, advantages and limitations.
41	NON-TRADITIONAL MACHINING	18ME641.4	Understand the constructional feature of the equipment, process parameters, process characteristics, applications, advantages and limitations EDM & PAM.
		18ME641.5	Understand the LBM equipment, LBM parameters, and characteristics. EBM equipment and mechanism of metal removal, applications, advantages and limitations LBM & EBM.
	NON CONVENTIONAL	18ME651.1	Describe the environmental aspects of non- conventional energy resources. In Comparison with various conventional energy systems, their prospects and limitations.
42	CONVENTIONAL ENERGY SOURCES	18ME651.2	Know the need of renewable energy resources, historical and latest developments

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		18ME651.3	Describe the use of solar energy and the various components used in the energy production with respect to applications like-heating, cooling, desalination, power generation, drying, cooking etc.
		18ME651.4	Appreciate the need of Wind Energy and the various components used in energy generation and know the classifications.
		18ME651.5	Understand the concept of Biomass energy resources and their classification, types of biogas Plantsapplications
		18ME651.6	Compare Solar, Wind and bio energy systems, their prospects, Advantages and limitations.
	-	18ME651.7	Acquire the knowledge
		18MEL66.1	Use the modern tools to formulate the problem, create geometry, descritize, apply boundary conditions to solve problems of bars, truss, beams, and plate to find stresses with different-loading conditions.
43	COMPUTER AIDED MODELLING AND ANALYSIS LAB	18MEL66.2	Demonstrate the ability to obtain deflection of beams subjected to point, uniformly distributed and varying loads and use the available results to draw shear force and bending moment diagrams.
		18MEL66.3	Analyze and solve 1D and 2D heat transfer conduction and convection problems with different boundary
		18MEL66.4	Carry out dynamic analysis and finding natural frequencies of beams, plates, and bars
	1	18MEL67.1	Determine the thermal conductivity of a metal rod and overall heat transfer coefficient of composite slabs.
44	HEAT TRANSFER LAB	18MEL67.2	Determine convective heat transfer coefficient for free and forced convection and correlate with theoretical values.
		18MEL67.3	Evaluate temperature distribution characteristics o steady and transient heat conduction through solid cylinder experimentally.

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		18MEL67.4	Determine surface emissivity of a test plate and Stefan Boltzmann constant
		18MEL67.5	Estimate performance of a refrigerator and effectiveness of a fin and Double pipe heat exchanger
		18MEMP68.1	Design and Implementation of system to measure the system optimally
45	MINIPROJECT	18MEMP68.2.	Analyzing the outcomes of experiment in hardware/software through comparison
	WHAH KOJEC I	18MEMP68.3	Imbibing Professional Ethics in Report Writing in systematic manner and adopting to quality presentation
46	Internship	CO-1	To understand the theory concepts and implement those in Industry environment.
		VIIS	SEM
		18ME71.1	Identify the type of control and control actions.
		18ME71.2	Develop the mathematical model of the physical systems
			Estimate the response and error in response of first
		18ME71.3	and second order systems subjected standard input signals
47	CONTROL ENGINEERING	18ME71.3	and second order systems subjected standard
47			and second order systems subjected standard input signals  Represent the complex physical system using bloc diagram and signal flow graph and obtain transfer.

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		18ME72.1	Define Automation, CIM, CAD, CAM and explain the differences between these concepts. Solve simple problems of transformations of entities on computer screen
40		18ME72.2	Explain the basics of automated manufacturing industries through mathematical models and analyze different types of automated flow lines.
	COMPUTER AIDED DESIGN AND	18ME72.3	Analyse the automated flow linestoreduce time and enhance productivity.
48	MANUFACTURING	18ME72.4	Explain the use of different computer applications in manufacturing, and able to prepare partprogramsforsimple jobs on CNC machine tools and robot programming.
		18ME72.5	Visualize and appreciate the modern trends in Manufacturing like additive manufacturing, Industry 4.0and applications of Internet of Things leading to Smart Manufacturing.
		18ME734.1	Explain the various approaches of TQM
	TOTAL QUALITY MANAGEMENT	18ME734.2	Infer the customer perception of quality
		18ME734.3	Analyse customer needs and perceptions to design feedback systems.
49		18ME734.4	Apply statistical tools for continuous improvement of systems
		18ME734.5	Apply the tools and technique for effective implementation of TQM.
		18ME741.1	Demonstrate the knowledge of the broad range of AM processes, devices, capabilities and materials that are available.
50	ADDITIVE MANUFACTURING	18ME741.2	Demonstrate the knowledge of the broad range of AM processes, devices, capabilities and materials that are available.
		18ME741.3	Understand the various software tools, process and techniques that enable advanced/additive

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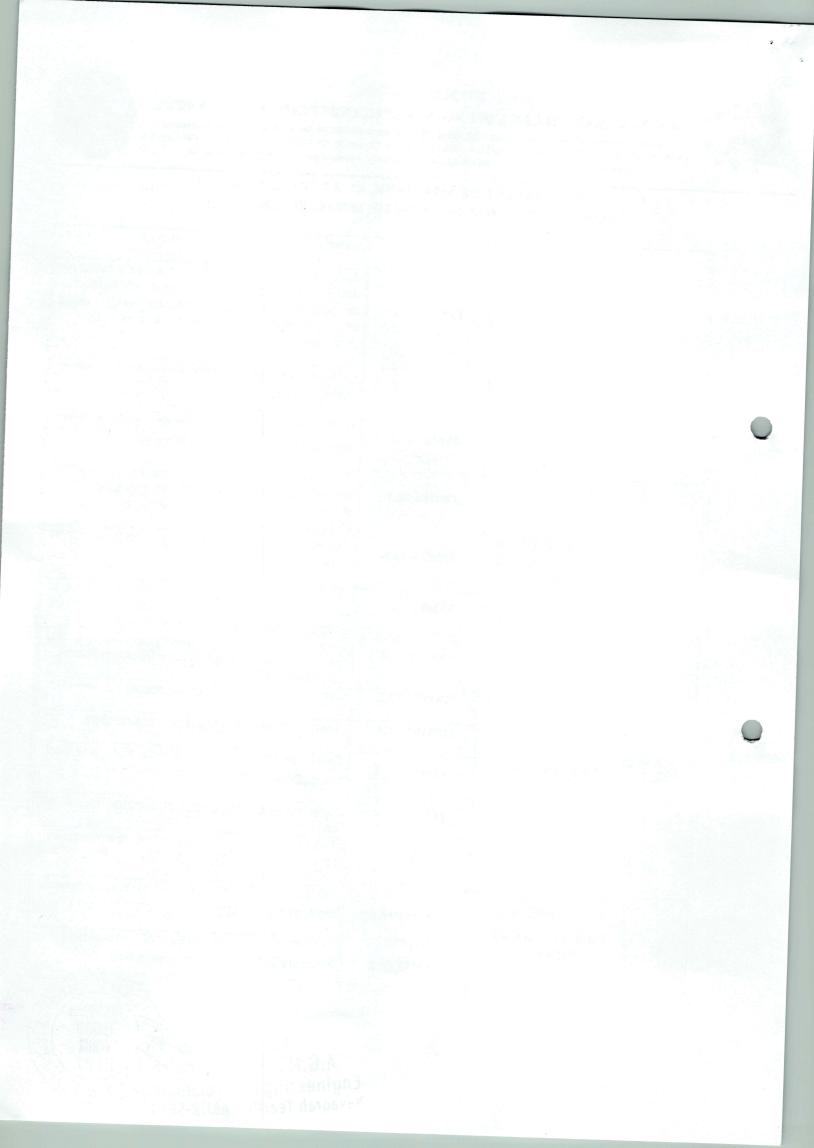


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			manufacturing.
		18ME741.4	Apply the concepts of additive manufacturing to design and create components that satisfy product development/prototyping requirements, using advanced/additive manufacturing devices and processes.
		18ME741.5	Understand characterization techniques in additive manufacturing.
		18ME741.6	Understand the latest trends and business opportunities in additive manufacturing
		18MEL76.1	To expose the students to the techniques of CNC programming and cutting tool path generation through CNC simulation software by using G-Codes and M-codes.
51	COMPUTRE AIDED MANUFACTURING LAB	18MEL76.2	To educate the students on the usage of CAM packages.
		18MEL76.3	To make the students understand the importance of automation in industries through exposure to FMS, Robotics, and Hydraulics and Pneumatics.
		18MEL77.1	Compute the natural frequency of the free and forced vibration of single degree freedom systems, critical speed of shafts.
		18MEL77.2	Carry out balancing of rotating masses.
		18MEL77.3	Analyse the governor characteristics.measure.
		TOMES	Determine stresses in disk, beams, plates and hook
52	DESIGN LAB	18MEL77.4	using photo elastic bench.
		18MEL77.5	Determination of Pressure distribution in Journal bearing  Analyse the stress and strains using strain gauges in the strain gauge strains are strains as the strain gauge strain gauge strains and strains are strains as the strain gauge strains are strains as the strain gauge strain gauge strains are strains as the strain gauge strains are strains as the strain gauge strain gauge strain gauge strains are strains as the strain gauge strain
		18MEL77.6	compression and bending test and
		18MEP78.1	Design and Implementation of system to measure the system optimally
53	PROJECT WORK PHASE-1	18MEP78.2	Analyzing the outcomes of experiment hardware/software through comparison

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		18MEP78.3	Imbibing Professional Ethics in Report Writing in systematic manner and adopting to quality presentation
54	INTERNSHIP	CO1	To understand the theory concepts and implement those in Industry environment.
		VIII SE	EM Supportion mechanisms like
		18ME81.1	EXPlain concepts of propagation mechanisms like Understand the construction and working of steam generators and their accessories.
55	ENERGY ENGINEERING	18ME81.2	Identify renewable energy sources and their utilization.
		18ME81.3	Understand principles of energy conversion from alternate sources including wind, geothermal, ocean, biomass, nuclear, hydel and tidal.
		18ME823.1	Classify various 144on-destructive testing methods.
	NON-DESTRUCTIVE TESTINGAND	18ME823.2	Check different metals and alloys by visual inspection method.
		18ME823.3	Explain and perform non-destructive tests like: Liquid penetrant test, Magnetic particle test. Ultrasonic test, X- ray and Gamma ray radiography Leak Test, Eddy current test.
56	EVALUATION	18ME823.4	Identify defects using relevant NDT methods.
		18ME823.5	Differentiate various defect types and select the appropriate NDT methods for betterevaluation.
		18ME823.6	Document the testing and evaluation of the results.
		18MEMP83.1	Design and Implementation of system to measur the system optimally
	PROJCT WORK	18MEMP83.2	Analyzing the outcomes of experiment in hardware/software through comparison
57	PHASE-II	18MEP83.3	Imbibing Professional Ethics in Report Writing systematic manner and adopting to quali presentation

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		18MES84.1	Read , Understand and realize the technical reports from reputed international journals.
58	TECHNICAL SEMINAR	18MES84.2	Prepare the essential contents from the report and express the knowledge through presentation
		18MES84.3	Imbibe the professional ethics while preparing the report and presentation.
59	Internship	CO-1	To understand the theory concepts and implement those in Industry environment

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