	KLEF						
		DEP		ENT OF MECHANICAL ENGINEERING			
C.N.	a a l			022 BATCH Course Outcomes (COs)			
S No	Course Code	Course Title	CO NO	Description of the Course Outcome			
			CO1 CO2	Apply the practical knowledge of using action words in sentence construction. Apply and analyse the right kind of pronunciation with regards to speech sounds and able to get different types of pronunciations.			
1	18UC1101	Basic English	CO3	Apply the concept of fundamental principle of counting to solve the problems on linear, circular permutations and also for the problems on selections. Apply the concept of probability, while doing the problems on Leap year & Non-Leap year problems, coins, dice, balls and cards.			
			CO4	Analyze the given conditions and finding out all the possible arrangements in linear & circular order. Analyze the given numbers or letters to find out the hidden analogy and apply that analogy to find solutions. Finding the odd man out by observing the principle which makes the others similar.			
			CO1	Apply the concepts of accurate English while writing and become equally at ease in using good vocabulary and language skills.			
			CO2	Understand the importance of pronunciation and apply the same day to day conversation.			
2	18UC1202	English Proficiency	CO3	Apply the concepts of Ratios, Percentages, Averages and Analysing the given information, a student is required to understand the given information and thereafter answer the given questions on the basis of comparative analysis of the data in the form of tabulation, bar graphs, pie charts, line graphs. Analyse the given data to find whether it is sufficient or not.			
			CO4	Apply the basic functionality of Clocks and Calendars to find the solutions for the problems. Analyze the given symbols to understand the hidden meaning of the given expression and finding the solutions. Analyze the given conditions and finding out all the possible arrangements in linear & circular order.			
	18UC2103	Professional Communication Skills	C01	Able to spot the common grammatical errors related to Sentence Structure, Preposition, Concord, Relative and Conditional Clauses, and Parallel Structures. The learner should be efficient to construct a context-determined text in addition to learning Technical Writing Skills. One should be enabled to use English Language efficiently in the written medium to communicate Personal as well as Professional.			
3			CO2	Able to read, understand, and interpret a text intrinsically as well as extrinsically. The learner can browse a text quickly to come-up with a gist and personal interpretation. One is able to create a healthy work-environment and prove to be an asset or one of the most reliable resources to the Organization. As a professional, one is mature to bridge the gulf between the existing behavior/ lifestyle and the expected corporate behaviour cum lifestyle.			
			CO3	Apply the concepts of Time and work, the students will be able to solve the questions related to Men-Time-Work, problems based on wages, pipes and cisterns. Apply the concepts of Time and Distance and solve the problems related to average speed, relative speed, problems based on trains, boats, circular tracks, races and games.			
			CO4	Apply Venn diagrams to the given statements to find out whether the given conclusions can be deducted from the given statements. Apply the logical implications and also the negations of various connectives to find the solutions. Analyze the given data and representing the data in the form of Venn Diagrams to find relations between any given set of elements.			
			CO1	Apply the concept of Critical Reading and Analytical Reading and comprehend the key ideas and gist of a passage. Understand the importance of the presentation skills, analyze the given topic, apply various strategies and the principles of grammar in written expression.			
			CO2	Apply the concepts of grammar, various strategies and the usage of formal language in written expression. By using synonyms rewrite the same text in the same format and meaning. Write the gist of the given text.			
4	18UC2204	C2204 Aptitude Builder-1 CO3	CO3	Apply the concepts of Numbers to solve the problems related to divisibility rules, problems based on Unit's digit, Remainders, Successive Division, Prime Factorization, LCM & HCF problems. Apply the concepts of Averages & Alligations, students will be able to solve the problems related to Averages as well as problems based on Mixtures.			
			CO4	Apply the various concepts of cubes to find out how to cut a cube to get the maximum number of smaller identical pieces, how to minimize the number of cuts required to cut a cube into the given number of smaller identical pieces, how to count the number of smaller cubes which satisfy the given painting scheme. Apply the principles of binary logic to solve problems involving truth-tellers, liars and alternators. Analyze the given data to form an ordered arrangement from an unorganized raw data.			

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			CO1	Apply the strategies and techniques learnt in carrying out conversations in different contexts. Analyse the different parameters and formats of written technical communication and apply in everyday work and life.
			CO2	Analyse the concepts of critical and analytical reading skills. Apply the strategies and techniques learnt in handling interviews in different contexts.
5	18UC3105	Aptitude Builder-2	CO3	Apply the concepts of Ratio & Proportion, Percentages, Profit &Loss, Simple & Compound Interest, students will be able to solve the problems based on Ratios, problems involving Percentages, problems related to cost price, selling price, profit, loss, marked price and discounts, problems involving interest.
			CO4	Analyze the given series of numbers to predict the next number in the series. Analyze the given set of numbers or letters to find the analogy. Analyze the given data to find the code which is used to encode a given word and use the same code in the process of decoding. Apply the given set of conditions to select a team from a group of members.
			CO1	To familiarize with various aspects of the culture and heritage of India through ages.
6	18UC0007	Indian Heritage	CO2	To acquaint with the contributions of Indians in the areas of languages and literature, religion and philosophy
0	18000007	mutali Hernage	CO3	To understand the Social structure and the spread of Indian culture abroad
			CO4	To know the development of Science and Technology in India through ages and to appreciate the contributions of some of the great Indian scientists
		Indian Constitution	CO1	To understand Constitutional development after Independence
7	18UC0008		CO2	To learn the fundamental features of the Indian Constitution
,	10000000	Indian Constitution	CO3	To get a brief idea of the powers and functions of Union and State Governments
			CO4	To understand the basics of working of Indian Judiciary and the Election Commission
		Ecology and Environment	CO1	Understand the importance of Environmental education and conservation of natural resources.
8	18UC0009		CO2	Understand the importance of ecosystems and biodiversity.
			CO3	Apply the environmental science knowledge on solid waste management, disaster management and EIA process.
		Universal Human	CO1	Understand and identify the basic aspiration of human beings
9	18UC0010	Values and	CO2	Envisage the roadmap to fulfill the basic aspiration of human beings.
		Professional Ethics	CO3	Analyze the profession and his role in this existence.
		Single Variable Calculus and Matrix Algebra	CO1	Model the physical laws and relations mathematically as a first order differential equations, solve by analytical and numerical methods also interpret the solution.
			CO2	Model physical laws and relations mathematically as a second/higher order differential equations, solve by analytical method and interpret the solution.
10	18SC1103		CO3	Obtain the Fourier series expansions of periodic functions and use the series to solve ordinary differential equations.
			CO4	Model physical problems mathematically as a system of linear equations and solve them by analytical and numerical methods. Also, determine the nature of Quadratic form using Eigen values.
			CO1	Identify the quantities of Real world problems by using the concepts of arithmetic.
		Foundations of	CO2	Computing the areas of regular and irregular solids of real world problems.
11	18SC1104	Computational	CO3	Identifying the numbers by successive division also finding the solution of equations.
		Mathematics	CO4	Estimating the roots of an equations and find the unknown values from the data by numerical methods
			CO1	Understand how to use Venn diagrams to find the conclusion of statements, solve puzzles using binary logic.
12	18SC1105	Logic and	CO2	Understand to solve problems on clocks, calendars and problems on Non verbal reasoning.
12	10301103	Reasoning	CO3	Understand the available models for Venn diagrams with given data, solve problems relating to cubes and number and letter series.
			CO4	Understand the techniques used to solve problems puzzles using analytical reasoning on coding and decoding and blood relations

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			CO1	Determine extreme values for functions of several variables
12	400.474.204	Multivariate	CO2	Determine area, volume moment of inertia through multiple integrals in Cartesian or polar coordinates.
13	18MT1201	Calculus	CO3	Apply the concepts of vector calculus to calculate the gradient, directional derivative, arc length, areas of surfaces and volume of solids in practical problems
			CO4	Obtain analytical and numerical solutions of Heat and wave equations
			CO1	Develop familiarity with the physical concepts and facility with the mathematical methods of classical mechanics
			CO2	Analyze planar and spatial systems and to Analyze the forces in the members of trusses, frames.
14	18PH1010	Physics Elective (Mechanics)	CO3	Determine first moment and second moment for a given cross sections and problems related to friction
			CO4	Analyze the motion characteristics of a body subjected to a given force system
			CO5	Understand and analyze the engineering systems with the help of mechanics concept to solve the engineering problems.
			CO1	Ability to understand the electronic structure, chemical bonding, and atomic order and arrangements.
		Solid State Chemistry	CO2	Ablity to develop "chemical intuition" and quantitative understanding of chemical principles
15	18CY1002		CO3	Ability to Understand the crystal structure and its relationship to properties
			CO4	Ability to understand the Materials properties such as conductivity, optical transmission, stiffness, thermal expansion, and strength
			CO5	An ability to analyze and generate experimental skills
		Biology for Engineers	CO1	Acquire the Knowledge of basic biology
16	18BT1001		CO2	Acquire the Knowledge of Human Biological Systems
			CO3	Acquire Knowledge on Microorganisms and Biosensors
		Theory of Differential Equations in Engineering and Mechanics	CO1	Obtain the response of a mechanical system having single degree-of-freedom for free and forced vibrations through linear differential equations.
			CO2	Model and solve free and forced vibrations of a two- degree-of-freedom system through system of linear differential equations.
17	18MT2102		CO3	Obtain canonical forms of linear second order PDEs and Demonstrate the nature of the incompressible fluid flow using Euler and Bernoulli equations.
			CO4	Identify the heat and wave equations in different forms, obtain their responses and develop empirical relations.
			CO5	Determine the response of mechanical vibrating systems and heat equations which are modelled by ordinary or partial differential equations using MATLAB.
			CO1	Illustrate how problems are solved using computers and programming
		Problem Solving	CO2	Illustrate and use Control Flow Statements in C.
18	18SC1101	and Computer Programming	CO3	Interpret & Illustrate user defined C functions and different operations on list of data.
	-		CO4	Implement Linear Data Structures and compare them
			CO5	Apply the knowledge obtained by the course to solve real world problems
			CO1	Understand elementary programming concepts, and the basics in MATLAB
		Numerical	CO2	Understand linear algebra, probability and statistics for solving engineering problems
19	18ME2205	Computation for Mechanical	CO3	Solve a system through linear and nonlinear equations, and ordinary differential equations in Mechanical Engineering
		Engineers	CO4	Select an appropriate numerical approach for solving engineering problems
			CO5	Ability to select bench marks to confirm the computational approach

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			CO1	Perform basic computations in Python, including working with tabular data.
		Introduction to	CO2	Understand basic probabilistic simulations, statistical thinking and Stochastic Programs.
		Computational	CO3	Use good practices in Python programming using Computational Simulations.
20	18ME1204	Thinking and Data	CO4	Implement Computational data modeling and clustering using Python programming.
		Sciences		Apply the theoretical concepts to develop Python Programs to solve Optimization
			CO5	Problems and Computational Simulations with the applications of Solid and Fluid
			CO1	Mechanics concepts. Learn and practice the different views of representation of engineering drawings.
		Engineering	CO2	Learn and practice dimensioning and section of engineering drawings.
21	18ME1002	Graphics for Mechanical	CO3	Learn and practice the assembly drawings.
		Engineers	CO4	Make basic engineering drawings using both geometric instruments as well as graphics
				software with equal ease. Understanding different manufacturing techniques and their relative advantages/
			CO1	disadvantages with respect to different applications.
22	100451000	Workshop Practices	CO2	Fabricate components with their own hands.
22	18ME1003	for Mechanical Engineers	CO3	Get practical knowledge of the dimensional accuracies and dimensional tolerances
		Engineers		possible with different manufacturing processes.
			CO4	Assemble different components and produce small devices of their interest
		Circuits and	CO1 CO2	Understand the Basic of Electrical network elements Understand the behavior of semiconductor switches and its applications
23	18EE2205	Electronics	CO3	Apply Time & frequency domain analysis of first & second order networks
			CO4	Understand the Applications of Analog & Digital circuits
			CO1	Apply the concepts of basic programming to solve the basic problems, pattern based
		TECHNICAL	001	problems
24	18SC1106	SKILLS - 1(CODING)	CO2	Build solutions for problems on Numbers and array based problems , functions, recursion
			CO3	Solve problems solutions for character/string based problems and pointers
			CO4	Build solutions to programs on Data structures concepts.
	185C1207	TECHNICAL SKILLS - I1(CODING)	CO1	Apply the concepts of basic programming to solve the basic problems, patternbased
~-				problems
25			CO2 CO3	Build solutions for problems on Numbers and array based problems , functions, Solve problems solutions for character/string based problems and pointers
			CO3	Build solutions to programs on Data structures concepts
		MATERIALS FOR		Understand crystal structures and also to find lattice parameters using different XRD
		MECHANICAL	CO1	techniques
26	400112007	ENGINEERING	CO2	Understand different heat treatment processes and also understand the properties of smart
26	18PH2007	APPLICATIONS(O	CO3	materials Understand different types of semiconducting materials and ceramic materials
		PEN ELECTIVE)		
			CO4	Understand different types of composite materials and nano materials and its applications
		Mechanics and Materials-I	CO1	Analyze stresses in members with 1D axial loading or torsion
			CO2	Analyze shear force and bending moment diagrams
27	18ME1201		CO3 CO4	Analyze deflections and stresses in beams Design Columns and pressure vessels
				Apply the theoretical concepts to conduct various experiments of strength of materials
			CO5	practically and analyze the data
			CO1	Understand the basics of standards of measurement, limits, fits & tolerances industrial
		Measurements and		applications and identify the uses of gauges and comparators.
			CO2	Understand the significance of measurement system, errors, transducers, intermediate modifying and terminating devices.
28	18ME2106	Instrumentation	CO3	Interpret measurement of field variables like force, torque and pressure.
			CO4	Comprehend the fundamentals of thermocouple and strain measurement.
			CO5	Apply the theoretical concepts to conduct various experiments of Measurements
			005	practically.
			CO1	Understand and apply the fundamental principles and definitions of thermodynamics,
				fluid mechanics, and heat transfer. Apply the laws of thermodynamics for thermal systems associated with heat transfer and
			CO2	work transfer, entropy generation and its influence on engineering systems.
29	18ME2107	Thermal-Fluids	CO3	Elucidate the basic properties, principles and applications of fluids, fluid components,
29	TOINIESTO/	Engineering-I	03	fluid statics and different types of fluid flows.
			CO4	Describe fluid boundary layers, turbulence and their implementation in flow of fluid in
				engineering systems. Apply the theoretical concepts to conduct various experiments of thermodynamics, fluid
			CO5	
			000	Imechanics practically.
			C01	mechanics practically. Emphasize the fundamentals of mechanical behavior of materials

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30	18ME2108	MECHANICS AND	CO3	Interpret Fracture and Creep behavior of materials
	10	MATERIALS - II	CO4	Select the suitable material for mechanical applications
			CO5	Determine the properties of materials or analyze through ANSYS/MSC NASTRAN software.
			CO1	Identify, select and analyze kinematically suitable mechanisms for required motion of machinery
		KINEMATICS	CO2	Develop velocity and acceleration diagrams and analyze the data
31	18ME2109	AND DYNAMICS	CO3	Develop cam profiles and Analyze gears and gear trains kinematically
		OF MACHINES	CO4	Analyze mechanisms dynamically
			CO5	Apply the theoretical concepts to design mechanisms by using the simulation software and analyzing the data
			CO1	Draft various parts of machine components and their assemblies. Conversion of part drawings to assembly drawing and vice versa in conventional form.
32	18ME2110	Machine Drawing	CO2	Draw different line types and various dimensioning, conventional representation of
			CO3	materials and machine components, sectioning, limits, fits and tolerances. Develop and interpret production drawing for various machine elements
			CO3	Implement Computer Aided Drafting for various machine components using software.
			C04	Understand and apply the casting processes
		DESIGN AND	CO1	Apply the welding processes and identify the faults in welding processes
33	18ME2211	MANUFACTURIN	CO3	Apply principles of cold/hot forming processes
	-	G-I	CO4	Apply sheet metal processes and design sheet metal dies.
			CO5	Fabricate the parts using machine tools
				Apply the principles of thermodynamics, heat transfer, and fluid mechanics to the design
			CO1	and analysis of engineering systems.
				Elucidate the thermodynamics and fluid mechanics steady flow components of
	18ME2212		CO2	thermodynamic plant as well Laminar and turbulent flow of fluids in channels and over
34		Thermal-Fluids Engineering-II		surfaces.
54			CO3	Identify thermodynamic state of a pure substance and determine the thermodynamic
			005	properties and explain the design approach to thermodynamic plants.
			CO4	Analyze Rankine, power cyles and explain refrigeration and air conditioning systems.
			CO5	Apply analytical cognitive skills of the theoretical concepts to conduct various
				experiments of thermodynamics and fluid mechanics practically.
			CO1	Analyze one DOF free and forced undamped vibration systems
35	18ME2213	VIBRATIONS	CO2	Analyze and control of one DOF forced damped vibration systems
		AND CONTROL	CO3 CO4	Analyze and control of Two and Multi DOF vibration systems
			C04	Analyze continuous systems and vibration measurement. Design of shafts and couplings
		MACHINE	CO1	Design of fasteners and power screws
36	18ME3114	DESIGN	CO3	Design of belt drives and chain drives, brakes and lubrication system
		DEBTOIL	CO4	Design of gears for the given application
			CO1	Understand and analyze the working of various machining processes.
		DESIGN AND	CO2	Implement NC and CNC programing for machining simple components
37	18ME3115	MANUFACTURIN	CO3	Apply the automation of production lines.
		G - II	CO4	Design of various manufacturing processes.
			CO5	Implement modern manufacturing techniques
			CO1	Implement direct kinematics for robot design
38	18ME3116	ROBOTICS AND	CO2	Implement Inverse kinematics and Workspace analysis based robot design
		CONTROLS	CO3	Implement Artificial Intelligence in Robotic Applications
			CO4	Implement the task programming for robots
		PRODUCT	CO1	Identify and establish product specifications.
39	18ME3117	DESIGN AND	CO2	Selection of concept and Product architecture.
		DEVELOPMENT	CO3 CO4	Apply Industrial design techniques.
			04	To develop a Prototype Illustrate the primary concepts about management, its principles and functions and the
			CO1	types of business organizations and Demonstrate the knowledge to solve complex
			001	engineering problems in industrial scenario.
		ENGINEERING		Analyze the concepts of financial management includes present worth and future worth of
40	18ME3218	MANAGEMENT	CO2	invested money through cash flow diagram and differed annuities.
			CO3	Acquire knowledge in economic analysis and cost accountancy.
				Demonstrate the principles of business innovation and entrepreneurship for establishing
			CO4	industrial ventures
			66 i	Apply Fourier law of conduction and combined conduction convection concepts to 1-D
			CO1	heat transfer problems.
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			603	Analyze heat transfer using extended surfaces , unsteady state heat transfer and 2-D
<u>/</u> 1	181/152710	ΗΓΔΤ ΤΟ ΛΝΟΕΕΡ	CO2	conduction mode of heat transfer
41	18ME3219	HEAT TRANSFER	CO2 CO3	

43 ISTS702 SKILLING FOR FORINFERS-2 (ARTIFICAL INTELLIGENCE) COI COI COI COI COI COI COI COI COI COI	S No	Course Code	Course Title	CO NO	Description of the Course Outcome
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42 ISTS701 CRAINERES-1 (MANUTACTURE COD Frequencing of work piece for various welding operations and performing using different welding optiment 43 ISTS701 COD Frequencing of work piece for various welding operations and performing experiments in Casing, Machining, Welding and Raid on covering the performing experiments in Casing, Machining, Machini, Machini, Machining, Machini, Machining, Machining, Machini, Mach			CVILLING FOD		
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NG TECHNOLOGIES CO3 Production of pairs same graph prototyping (Co3 Near Status Near Status Near Status 43 INTS702 SKILLING FOR (ARTIFICAL INTELLIGENCE) Co3 Analyze the appropriate methodologies for problem decompositions, planning and constraint durfactions. 44 INTS702 SKILLING FOR (ARTIFICAL) CO3 Analyze thid drow drough pies or channels (internal drow) Research and appropriate methodologies for problem decompositions, planning and constraint durfactions (various experiments on Search Techniques and Language Representation using Predicate Logic, Representing Knowledge (PROBLES) 44 INTS704 SKILLING FOR (CO3 Analyze thid drow drowing pies or channels (internal drow) Co3 Analyze thid drow drowing high or channels (internal drow) 45 INTS704 SKILLING FOR (CO3 To Perform static and drowing analysis of 2-D structures Co3 Independencies 46 INTS704 SKILLING FOR (PROFICENCY & TRAINING CO3 Indepredication and drowing analysis of 2-D structures 47 INTS704 FECHINICAL (DATA CO3 Inderestand frame/stru	42	18TS701		CO3	
Hands on experience for performing experiments in Casting, Machining, Welding and Registration of the second sec	.2	1015/01		CO4	
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43 ISTS702 SKILLING FOR FORINFERS-2 (ARTIFICAL INTELLIGENCE) COI COI COI COI COI COI COI COI COI COI				COS	
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45 INTSID2 (ARTIFICIAL INTELLIGENCE) CO3 Understand Knowledge Representation using Predicate Locie. Representing Knowledge using Rules. Screamic Nets, Franzes and Conceptual dependencies. 44 INTSID CO3 Apply the theoretical concepts to conduct virous experiments on Search Techniques and Language Representation using al. 44 INTSID FNGINFERS3 CO3 Analyze thind flow through pipes or chamels (internal flow) 45 INTSID SKILLING FOR CO3 Analyze thind more and the transfer from virous systems 46 INTSID SKILLING FOR CO3 Analyze thind more and phannic analysis of 1-D structures 47 INTSID SKILLING FOR CO3 CO4 CO3 48 INTSID SKILLING FOR CO3 CO4 CO3 49 INTSID SKILLING FOR CO3 CO4 CO4 40 INTSID SKILLING FOR CO3 CO4 CO3 CO4 41 INTSID SKILLING FOR CO3 CO4	42	1070702		CO2	
Image: Problem in the second	43	1813702		CO3	Understand Knowledge Representation using Predicate Logic, Representing Knowledge using Rules. Semantic Nets, Frames and Concentual dependencies.
44 INTS703 SKILLING FOR ENGINEERS-3 (ROBLEM SOLVING CO1 Analyze fluid flow incugif press or channels (internal flow) 45 INTS704 SKILLING FOR (ROBLEM SOLVING CO3 Analyze stady and transient heat transfer through various systems 45 INTS704 SKILLING FOR (ROBLEM SOLVING CO4 Analyze study and transient heat transfer from various systems 46 INTS704 INTS704 SKILLING FOR (ROBLEM SOLVING CO2 To Perform stuic and dynamic analysis of 1-D structures 46 INTS704 INTS704 CO2 To Perform stuic and dynamic analysis of 1-D structures 47 INTS705 INTS706 CO4 Identifying and solving the real complex engineering problems 48 INTS705 TACHING-1 (DATA ANALYTICS) CO2 Scopes and possible limitations of each method; and show capability of using data analytics skills to provide constructive guidance in decision muking. 47 INTS705 TECHNICAL (MACHINE ANALYTICS) CO4 Userstand he basic Python Programming and basic computations using Python results correctly with detailed and useful information. 48 18GN107 Cocurricular Activity-1 CO4 Understand and apply Supervised Machine Learning techniques- Classification results indecisi				CO4	Apply the theoretical concepts to conduct various experiments on Search Techniques and
44 ISTS703 ENGINEERS-3 (PROBLEM SOLVING CO2 Analyze fluid flow over different geometrical objects (central flow) 45 ISTS704 SKILJNG FOR ENGINEERS-4 (PROBLEM SOLVING CO1 To Perform static and dynamic analysis of 1-D structures 45 ISTS704 SKILJNG FOR ENGINEERS-4 SOLVING CO1 To Perform static and dynamic analysis of 1-D structures 46 ISTS705 FTECHNICAL PROFECTENCY & TRAINING-1 (DATA ANALYTICS) CO2 To Perform static and dynamic analysis of 3-D structures 46 ISTS705 TECHNICAL PROFECTENCY & TRAINING-1 (DATA ANALYTICS) CO2 To perform static and dynamic analysis of 1-D structures 47 ISTS705 TRAINING-1 (DATA ANALYTICS) CO3 To perform static and dynamic analysis and real-world problems. 47 ISTS705 TRAINING-1 (DATA ANALYTICS) CO3 Demonstrate a sophistic and duestanding of the concepts and methods; know the exact scopes and possible limitations of each method; and singhuf analysis and interpret the results correctly with detailed and useful information. 47 ISTS706 TECHNICAL (CO2 CO3 Understand and apply breviate onduct data analytics using vehanol correct methods; and draw reasonable conclusions with sufficient explanation and elaboration. Make better decisions by using advancet techiniques reasonable concet methods; an			SKILLING FOR	CO1	
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52 18GN3111 Activity -5 CO3 Understand and work effectively as an individual in a Team. CO4 Improve their creativity in developing useful models. CO1 Communicate effectively in the gathering. CO2 Demonstrate their interpersonal and communication skills.			~		
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Courricular CO1 Communicate effectively in the gathering. 53 18GN3212 Cocurricular CO2 Demonstrate their interpersonal and communication skills.			Activity -5		
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53 18GN 3212			Comming		
	53	18GN3212	Activity -6	C02 C03	Understand and work effectively as an individual in a Team.

S No	Course Code	Course Title	CO NO	Description of the Course Outcome
			CO4	Improve their creativity in developing useful models.
			CO1	Design and selection of various belt and chain drives
		DESIGN OF	CO2	Design and Selection of the suitable bearing for the given loading condition
54	18ME4051	TRANSMISSION	CO3	Analyze kinematic and dynamic aspects in design of brakes, clutches
		ELEMENTS	CO4	Design and analysis of different types of gear drives
			CO5 CO1	Analyze machine elements using analysis software
		THEORY OF	CO1 CO2	Analyze stresses and strains in planes in elastic or plastic region Solve 2-D problems in rectangular Components
55	18ME4052	ELASTICITY AND	CO3	Analyze stresses and strains in 3-D problems
		PLASTICITY	CO4	Analyze Beams and frames in plasticity applications
		ADVANCED	CO1	Understand the concepts of acoustics and vibrations
56	18ME4053	VIBRATIONS	CO2	Determine the sources of vibrations
50	1000124055	AND NOISE	CO3	Measure the level of vibration and control the vibrations
		CONTROL	CO4	Measure and control the noise observed from vehicles.
			CO1	Understand the Fundamentals of CAD and display devices
57	18ME4054	COMPUTER	CO2	Apply the concept of geometric modelling
		AIDED DESIGN	CO3	Able to apply concept of Surface and solid modelling
			CO4 CO1	Application of various Geometric transformations Assess the failure of unflawed structural components
		CREEP FATIQUE	CO1 CO2	Assess the fatigue life of structural components under the specified load spectrum
58	18ME4055	AND FRACTURE	CO3	Evaluate the fracture toughness and assess the life of flawed structural components
		MECHANICS	CO4	Assess the life of structural components under creep
			CO1	Analyze statically indeterminate beams
			CO2	Analyze stresses in curved beams and Examine the Shear Centre for various cross
		ADVANCED	002	sections of beams
59	18ME4056	STRENGTH OF MATERIALS	CO3	Apply unit load method to find deflections in beams and structures
			CO4	Analyze stresses in rotating members and thick cylinders
			CO5	To simulate the structural members using ANSYS and validate the results with analytical
			CO1	methods Vacuu the composite metarials and menufacturing methods
	18ME4057	MECHANICS OF COMPOSITE MATERIALS	CO1 CO2	Know the composite materials and manufacturing methods Understand the behaviour of composite Lamina
60			CO3	Know the properties of various types composite materials
			CO4	Apply Failure theories to calculate stresses in composite materials
			CO1	To classify and understand the need of Non-Traditional Manufacturing Processes.
				To understand the working principle, mechanism of metal removal and the effect of
		MODREN	CO2	various process parameters on its performance of various Non-Traditional Machining
61	18ME4061	MANUFACTURIN		Processes.
		G PROCESSES	CO3	To understand the working principle and the effect of various process parameters on its
			CO4	performance of various Non-Traditional Welding Processes.
			CO4 CO5	To understand the working principle of various Non-Traditional Forming Processes. Apply the modern manufacturing techniques
			C01	Ability to identify different types of optimization problems
			CO2	Understand basic concepts in solving nonlinear optimization problems
62	18ME4062	ADVANCED MATERIALS		Understand optimality conditions for unconstrained and constrained optimization
			CO3	problems and be able to apply them in verifying the optimality of a solution
			CO4	Understand basics of choosing and implementing optimization methods
			CO1	To be able to properly distinguish between the hype and realities of additive
				manufacturing
(2)	1914062	ADDITIVE	CO2	To understand the basic AM processes, and the limitations and advantages of each.
63	18ME4063	MANUFACTURIN G	CO3	To understand the differences between traditional processes and additive manufacturing production, including the differences in design methodology.
		0		To use AM terminology properly and understand the role and importance of standards in
			CO4	the additive manufacturing industry.
			CO1	Develop the ability to design cutting tools for given single component.
		TOOL	CO2	Design and development of various die configurations.
64	18ME4064	ENGINEERING	CO3	Design and development of jigs for given component.
		AND DESIGN	CO4	Design and development of fixtures for given component.
			CO5	Gain practice on designing the tools and dies using a software package.
			CO1	Analyze various production schedules and plant layouts.
	101 00 10 10	FLEXIBLE	CO2	Apply the concept of group technology to the development of FMS.
65	18ME4065	MANUFACTURIN	CO3	Identify hardware and software components of FMS.
		G SYSTEMS	CO4	Analyze materials handling and storage system in FMS.
			CO5	Conduct experiments & hands on experience related to NC part programming
		GEOMETRIC	COL	
			CO1	Understand the Application of Dimensioning Understand the application of Tolerances
66	18ME4066	GEOMETRIC DIMENSIONING AND	CO1 CO2 CO3	Understand the application of Tolerances. Read and interpret the industrial drawings.

S No	Course Code	Course Title	CO NO	Description of the Course Outcome
		REVERSE	CO1	Understand the need of reverse engineering
67	18ME4067	ENGINEERING	CO2	Understand working principles of RP techniques
07	1000124007	AND RAPID	CO3	Understand Rapid tooling and RP case studies
		PROTOTYPING	CO4	Understand applications of RP techniques
			CO1	Understand various principles, components, classification of automobiles.
			CO2	Understand working of Engine cooling system, coolant properties and combustion chambers.
68	18ME4071	AUTOMOBILE ENGINEERING	CO3	Understand various lubricating systems, its properties and Transmission systems of an Automobile.
		ENGINEERING	CO4	Understand the concepts of Suspension system and Vehicle control in an Automobile.
			CO5	Able to apply the various concepts of Automobile engineering using simulation and analysis through suitable software
			CO1	Understand the basic knowledge on automobile engine nomenclatures and its performance parameters involved in developing an engine
			CO2	Apply knowledge to explore different types of design models and factors involved in modeling an engine component in details with real time application.
69	18ME4072	AUTOMOBILE ENGINE DESIGN	CO3	Comprehend different functional aspects for good performance of an engine and factors causing failure of an engine
		ENGINE DESIGN	CO4	Understand different types of maintenance activities involved and study of faultfinding equipment in detail.
			CO5	Modeling and analysis of engine components of an automobile using CAD software tools
			CO1	Laboratory Understand the importance of construction and working of a clutch in automobile
		AUTOMOTIVE TRANSMISSION	CO2	industry and troubleshooting of clutch Understand the importance of construction and working of gear box and total resistance
70	18ME4073		CO3	to motions Understand different mechanisms used while adopting a torque converter and various
			CO4	Automotive Transmission mechanisms
			CO4	Understand working principle of drive line system components
			CO5	Apply contemporary issues and their impact on provided solution in addition to that students will be able to solve open-ended problem related to design the transmission components using CAD
			CO1	Understand various principles, characteristics, testing, maintenance, and servicing of batteries.
			CO2	Understand working of ignition system of an S I engine, its maintenance and service.
71	18ME4074	AUTOTRONICS &	CO3	Understand wiring for Auto electrical systems for IC Engines
		SAFETY	CO4	Understand the concepts of safety for various domains in automobiles.
			CO5	Apply the various concepts of Automobile engineering using electronics through suitable software
			CO1	Acquire comprehensive knowledge on Electric Vehicles and Hybridization of automobiles with applications.
			CO2	Understand the technology of Hydrogen driven vehicles and fuel properties along with application in engine performance.
		ALTERNATIVE		Comprehend about Solar powered automobiles and estimate the performance of engines
72	18ME4075	ENERGY SOURCES FOR	CO3	driven by alternative liquid fuels (Biofuels) and gaseous fuels (Natural Gas and Propane
		AUTOMOBILES	CO4	vehicles). Explore and conjecture the emerging technologies and future source of alternative fuels in
			CO5	automobiles. Practically study the various technologies of alternative energy sources applied in the
		AUTOMOTIVE	CO1	advanced scenario of automobile engineering.
		ELECTRICAL	C01 C02	Understanding battery, Cranking motor construction and testing methods. Understand the principle of alternator and to test the alternator.
73	18ME4076	AND	C02	Understand the Electronic Controls in Gasoline Engine.
	10.121070	ELECTRONICS	CO4	Understand the basics of Vehicle Motion Control and telematics system
		SYSTEM	C04	Perform OBD II test on vehicle and Program MYRIO hardware using Lab view.
				Apply the knowledge of basic engine technology along with principle. Summaries of
			CO1	Engine Cycles.
		AUTOMOBILE	002	Apply the concept performance aspect of mixture preparation and ignition system for SI
74	18ME4077	ENGINE SYSTEM	CO2	and CI Engines and Combustion in Engines.
		AND	CO3	Pollutant Formation, Emission control methods and Emission norms
		PERFORMANCE	CO4	Engine Testing, Performance analysis and Emerging Engine Technologies
			CO5	Experiments on I C Engines for performance calculation
		AUTOMOTIVE	CO1	Learn the sensor classification and sensor product selection guide.
	18ME4081		CO2	Analyze the measurement of engine parameter using sensor.
75				
75	18ME4081	SENSOR AND APPLICATIONS	CO3	Apply required sensors and actuators for automotive applications

S No	Course Code	Course Title	CO NO	Description of the Course Outcome
			CO1	Understand the automotive electronics for engine management system
76	18ME4082	AUTOTRONICS	CO2	Analyze required sensors and actuators for an automotive application
70	10002	nerences	CO3	Apply the suitability of a control system for automotive application
			CO4	Ability to analyze of electronic system for automotive applications
			CO1	Understand the automotive instruments and automotive sensors
		ELECTRONIC	CO2	Learn the measurement of engine parameter by using sensor.
77	18ME4083	ENGINE MANAGEMENT	CO3	Acquire ability to analyze the electronic fuel injection system
		SYSTEM	CO4	Apply the principles of digital control techniques and the application of on board
		SISTEM	CO5	diagnosis Experiments on computerized Diesel Engine and Lab view based Engine control unit
				Understand the knowledge of various Measuring Instruments to design a simple
		INSTRUMENTATI	CO1	Instrumentation system
78	18ME4084	ON IN	CO2	Analyze the various instruments and use them in various fields
		AUTOMOTIVE	CO3	Learn and apply the measuring instruments in various industries application
		INDUSTRIES	CO4	Analyze suitable instrument for a given application
		AUTOTRONICS	CO1	Analyze various electronics systems like sensors
79	18ME4085	AND VEHICLE	CO2	Understand Fuel injection and Ignition system
17	10001240005	INTELLIGENCE	CO3	Understand Electric vehicles and hybrid vehicles
		IIII DELIOEIIIOE	CO4	Design of intelligence vehicle systems
			CO1	Understand the importance of automotive systems
80	18ME4086	AUTOMOTIVE	CO2	Understand the Two-wheel drive, four-wheel drive vehicles
		SYSTEMS	CO3	Analyze the transmission system
			CO4	Analyze control system for Automotive systems
		PROGRAMMABL	CO1	Understand the importance of Factory Automation
81	18ME4087	E LOGIC	CO2 CO3	Understand the functions and operations of PLC Understand the Installation and maintenance procedures for PLC
		CONTROLLERS	CO4	Analyze PLC for the control of industrial processes
			C04	Understand the concepts of AI
	18ME4091	ARTIFICIAL INTELLIGENCE FOR ROBOTICS	CO2	Apply basic principles of AI in solutions that require problem solving and planning.
82				Apply basic principles of AI in solutions that require problem solving, planning,
			CO3	reasoning and learning
			CO4	Analyze AI in Robotics
			CO1	Understand the design principles of automation and its application in an automated
			COI	manufacturing system
			CO2	Analyze pneumatic sub-systems of an automated manufacturing system in terms o
83	18ME4092	AUTOMATION	002	design, operation and control aspects
		SYSTEM DESIGN	CO3	Analyze hydraulic sub-systems of an automated manufacturing system in terms of design
				operation and control aspects
			CO4	Understand programmable automation with regard to the computer integrated
			CO1	manufacturing system Understand the concepts industrial automation and measurement systems
		INDUSTRIAL	CO1	Apply the controllers in automation
84	18ME4093	AUTOMATION AND CONTROL	CO2	Analyze and select a suitable PLC system for the given application
			CO4	Apply the concepts of control systems for industrial automation
			C01	Learn the concepts hydraulic or pneumatic actuation system
		INDUSTRIAL	CO2	Analyze diagnose maintenance problems of hydraulic and pneumatic system
85	18ME4094	HYDRAULIC AND PNEUMATIC		Analyze required components to develop an automation system using pneumatics and
		SYSTEMS	CO3	hydraulic system
			CO4	Develop circuits for controlling hydraulic and pneumatic using PLC
		INDUSTRIAL	CO1	Understand the concepts of robot, sensors and their applications in robots
		ROBOTICS AND	CO2	Learn material handling equipment used both in automated and non-automated systems
86	18ME4095	MATERIAL		
		HANDLING	CO3	Analyze and select a suitable material handling system for the given application
		SYSTEMS	CO4	Apply the various applications of robots in material handling
87		Managavera	CO1	Understand the concept of 8051 microcontroller
	18ME4096	MICROCONTROL LER AND PLC	CO2	Design the 8051 microcontroller
		LER AND PLC	CO3	Understand the concept of PLC
			CO4	Write ladder logic in Programmable logic controllers.
			CO1	Understand the approach used for mechatronic system design and relevant considerations
		MECHATRONICS	CO2	Applythe suitable sensors and actuators used in a Mechatronic system
88	18ME4097	SYSTEM DESIGN		Analyze signal conditioning interface in a Mechatronic system and implementation of
			CO3	control systems
			CO4	Modeling and Simulation for the Mechatronic System design perspective
			CO1	Able to know the Basics of Computation, Algorithms, and Functional Programming.
			CO2	Able understand the Iterative style, recursive style, and efficiency issues in programming.

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89	18ME4101	PROGRAMMING	CO3	Able to understand the Basics of imperative style programming, Assertions, and Loop invariants.
		SKILLS	CO4	Able to understand Top down design, Step-wise refinement, structures, encapsulation, and object-oriented programming.
			CO5	Able to Apply the theoretical concepts of programming to develop and execute the
			CO1	programs. Able to know the Basics of Descriptive Statistics.
		DATA	CO2	Able understand the Inferential Statistics.
90	18ME4102	ANALYTICS	CO3	Able to understand the Basics of Regression & ANOVA.
			CO4 CO5	Able to understand Prescriptive analytics. Able to Apply the theoretical concepts of data analytics to solve problems.
			C01	Able to know the Basics of Programming, and Python.
			CO2	Able understand Lists, Function definition, Sorting, Passing functions.
0.1	101/07/102	DUTION	CO3	Able to understand Exception handling, Input / output, File handling, String processing,
91	18ME4103	PYTHON		Backtracking, Scope, Data structures. Able to understandClasses, Objects and user defines data types.
			CO4	
			CO5	Able to Apply the theoretical concepts of python to develop and execute the programs.
			CO1	Able to know the Basics of Machine Learning.
		MACHINE	CO2 CO3	Able understand Model Validation Approaches, Discriminant Analysis. Able to understand Random Forest, Neural Networks Deep learning.
92	18ME4104	LEARNING		Able to understand Clustering, Associative Rule Mining, and Challenges for big data
			CO4	analytics.
			CO5	Able to Apply the theoretical concepts of Machine Learning to solve problems.
			CO1	Introduction to AI, Understand about intelligence, knowledge and Artificial Intelligence,
	18ME4105	ARTIFICIAL INTELLIGENCE		techniques of AI as a State space search, Production Systems. Problem solving by Search, Heuristic Search, Randomized search techniques and Finding
			CO2	Optimal paths
93			CO3	Analyze the appropriate methodologies for problem decompositions, planning and constraint data constraint satisfactions.
			GOL	Understand Knowledge Representation using Predicate Logic, Representing Knowledge
			CO4	using Rules, Semantics Nets, Frames and Conceptual dependencies.
				Understanding the Concepts of Fuzzy sets, Fuzzy Logic, importance of membership
			CO1	functions, Fuzzy Rule, and operations on fuzzy sets, Principles of Fuzzy Logic System in
		FUZZY LOGIC		solving the complex engineering problems Applications of Fuzzy sets for real time problems of various domains using Fuzzy Logic
94	18ME4106	AND NEURAL	CO2	control system
		NETWORKS	CO3	Understand Neural Model and Network Architectures, Perceptron Learning, Supervised
			003	Hebbian Learning, Back propagation, Associative Learning,
			CO4	Understanding Neuro Fuzzy Approaches, Computing with Neural Nets and Applications of Neural Network in various Domains
			CO1	Understand the concept of robotics with respect to their anatomy, Sensors and
05	191454107	DODOTICS		Controllers.
95	18ME4107	ROBOTICS	CO2 CO3	Understand the image processing techniques in Robot vision Understand the working of Robots in various mechanical applications
			CO4	Understand the various Robot Languages
			CO1	Identify appropriate sensor, Identify appropriate actuation system for a given application.
			CO2	Identify appropriate microcontroller for a given application and to build a mathematical Model of system for evaluating open loop system performance and behaviour.
96	18ME40B4	4 Mechatronics	CO3	Identify an appropriate closed loop control strategy to attain the desired system behaviour.
			CO4	Suggest a Mechatronic product design for a given application and evaluate its
			0.04	performance.
			CO1	Analyze the anatomy of existing robotic systems and their performance specifications, end effectors etc
07	1010000		CO2	Analyze a robotic system with respect to the suitable sensors, actuators for its performance.
97	18ME40B5	Robotics	CO3	Understand manipulator kinematic analysis and joint trajectory plan for a given end effector.
				Classification of Robot Languages, Comprehensive identification of suitable Robotic

S No	Course Code	Course Title	CO NO	Description of the Course Outcome
			CO1	Model and Solve for the optimum solutions using LPP
		0B6 Operations Research	CO2	Model and Find the Optimized solutions for the problems in the field of Transportation
98	18ME40B6			and Management / Assignments.
90	1000124020		CO3	Model and Optimize Game theory, Dynamic Part Programming, Queuing Theory,
				Inventory Control & Simulation Problems
			CO4	Understand and solve the Concepts related to PERT/CPM