MECHANICAL ENGINEERING
COURSE OUTCOMES - R18

S.No	COURSE CODE	COURSE TITLE	COURSE OUTCOMES
1	1821101	Mathematics-I	CO 1 Apply the essential tool of matrices in a comprehensive manner. CO 2 Describe the convergence of series. CO 3 Classify the functions of several variables which is useful in optimization techniques. CO 4 Define Beta and gamma functions and solve definite integrals. CO 5 Determine the Fourier series of the functions.
2	1823102	Engineering chemistry	CO 1 Remember the major chemical reactions that are used in the synthesis and stereochemistry of Molecules. CO 2 Understand the periodic properties such as ionization potential, electro negativity and oxidation states. CO 3 Determine the ranges of the electromagnetic spectrum used for exciting different molecular Energy levels in various spectroscopic techniques. CO 4 Analyze microscopic chemistry in terms of atomic and molecular orbital and intermolecular forces. . CO 5 Outline the properties of metals, water and thermodynamic considerations.
3	1824103	English	CO 1 Describe the classification of words, sentences and their usages in sentences. CO 2 Understand the difference between spoken and written English. CO 3 Analyze the rules in language for changing the form of sentences. CO 4 Illustrate the factors that influence grammar and vocabulary in speaking and writing CO 5 Classify the parts of speech, tenses and sentence structures
4	1805104	Programming for problem solving	CO 2 Analyze a given problem and develop an algorithm to solve the problem. CO 3 Apply proper branching and loop constructs to solve a complex problem CO 4 Understand the concepts of arrays and strings to solve real time applications CO 5 Apply modular approaches for solving complex problems CO 6 Illustrate memory optimization for solving real world problems using structures and Unions

5	1823107	Chemistry lab	CO 1 Compare rate constants of reactions from concentration of reactants/products as a function of time. CO 2 Evaluate molecular/system properties such as surface tension, viscosity, conductance of solutions, redox potentials, chloride content of water, etc. CO 3 Analyze of drug molecule and salt sample. CO 4 Determine the quantity of water sample by estimation of hardness of water, chloride content, DO , etc.
6	1805108	Programming for problem solving lab	CO 1 Analyze given problem and develop an algorithm CO 2 Implement Code and debug programs in C language using various constructs CO 3 Choose proper C language constructs to solve complex problems. CO 4 Organize and implement heterogeneous data in efficient memory utilization
7	1824109	English lab	CO 1 Describe objects, places and persons. CO 2 Understand the listening process and answer the questions related to it. CO 3 Analyze phonetics with examples CO 4 Illustrate different modes of communication skills CO 5 Classify LSRW skills
8	1821201	Mathematics-II	CO 1 Gain a higher level of personal involvement and interest in understanding and solving environmental problems. CO 2 Understand the interconnection of human dependence on this ecosystem. CO 3 Influence their society in proper utilization of Natural resources. CO 4 Increases critical thinking and helps in analyzing the impact of developmental activities on environment CO 5 Learn the management of environmental hazards and disasters and have a clear understanding on environmental concerns and follow sustainable developmental activities.

9	1822204	Engineering physics	CO1. Expose students to theoretical and mathematical aspects of Interference, Diffraction techniques and Lasers for testing of materials. CO2. To understand the concepts of Simple harmonic Oscillator & non dispersive Transverse & Longitudinal waves . CO3. Develop knowledge and understanding the fundamental concepts of solids and semiconductors. CO4. Adaptability to new developments in science and technology.
10	1802205	Basic electrical Engineering	CO1: Understand the functionalities of the diodes. CO2: Analyze the performance of rectifiers. CO3: Use the transistors in various applications CO4: Understand the working of voltmeters and CROs.
11	1803207	Engineering graphics &Design	CO 1 Use CAD drafting and editing tools along with page templates ,title block & print settings CO 2 Describe the geometric details of Engineering objects &Become familiar with Auto Cad 2D ,3D drawings CO 3 Understand Engineering drawing basic theory of projections related to points lines, ,plane and solids in different orientations and drafting them in cad software CO 4 Analyze various sectional views related to Engineering Drawings and Create isometric drawings with 3d tools along with basic theory& procedures in engineering drawing
12	1822208	Engineering physics lab	CO1. To explore the application of interference and diffraction by doing concerned experiments. CO2. Elucidate the concepts of Physics through involvement in the experiment by applying theoretical knowledge. CO3. Develop an ability to apply the knowledge of physics experiments in the later studies. CO4. To understand the concept of energy gap, B-H curve, and synthesis of nano material by performing the experiments.
13	1802209	Basic electrical Engineering lab	CO1: Utilize knowledge of CRO, diodes and rectifiers. CO2: Perform experiments on transistor circuits.

14	1823211	Workshop and manufacturing practices	CO 1 Identify different manufacturing processes which are commonly employed in the industry CO 2 Analyze the practical knowledge about fabricate components using different materials with their ownhands CO 3 Understand the knowledge of the dimensional accuracies and tolerances applicable for different manufacturing processes CO 4 Understand the knowledge of the dimensional accuracies and tolerances applicable for different manufacturing processes
15	1821301	Biology for Engineers	CO 1 Define the cells, its structure and function, and Different types of cells and basis for classification of living organisms CO 2 Explain about biomolecules its structure and function and their role in a living organism. CO 3 Demonstrate the concept of biology and its uses in combination with different technologies for production of medicines and production of transgenic plants and
16	1821302	Numerical methods,probability and statistics	CO 1 Determine the roots of polynomial and transcendental equations by different methods. (L3) CO 2 Apply discrete and continuous probability distributions.(L3) CO 3 Demonstrate the components of a classical hypothesis test. (L3) CO 4 Infer the statistical inferential methods based on small and large sampling tests. (L4)
17	1803303	Thermodynamics	CO 1 Understand the concept of system, Control volume, thermodynamic properties ,Thermodynamic Equilibrium, work and heat CO 2 Apply the Laws of Thermodynamics to thermodynamic system CO 3 Use Steam tables to define properties of steam CO 4 Estimate the performance of Gas Power cycles applied to prime movers
18	1803304	Manufacturing processes	CO 1 Describe the right pattern for an application and proper method of moulding CO 2 Understand special castings and defects of casting process to suggest suitable Remedies CO 3 Apply various special welding techniques and other metal joining processes CO 4 Select appropriate metal forming techniques to be used for an application.

19	1803305	Strength of materials	CO 1 Determine the stresses , strains in bars subjected to loads and temperatures CO 2 Draw the Shear Force and Bending Moment diagrams for beams CO 3 Evaluate the bending & shear stress in beams ,longitudinal & hoop stresses in thin and thick cylinders CO 4 Analyze Torsions in shafts and deflections in various beams
20	1803306	Material science and engineering	of metals and non metallic materials CO 2 Explain the mechanism of crystallization of metals CO 3 Determine the grain size by using various methods for different Alloys CO 4 Analyze the binary phase diagram of iron iron carbon equilibrium diagram. and (TTT) diagram for heat treatment process
21	1801307	Engineering Mechanics	CO 1 Determine the resultant of system of Forces CO 2 Identify equilibrium conditions for static problems CO 3 Determine the centroid of composite figures ,centre of gravity of bodies ,area, moment of inertia and mass moment of inertia CO 4 Analyze trusses for forces in members
22	1803308	Material science and engineering lab	CO 1 Use the metal specimen and trace the microstructure at different magnifications CO 2 Determine the hardness of the given Steel specimen before and after annealing and normalizing operations CO 3 Develop the behavior of material under tensile load and draw stress strain diagram CO 4 Analyze hardness test on mild steel , brass and copper
23	1803309	Manufacturing technology lab	CO 1 Examine a pattern with allowances CO 2 Test the properties of the moulding sand and prepare a casting CO 3 Develop a model using arc welding ,spot welding and soldering

24	1803401	Applied thermodynamics	CO1. Understand the concept and working of I.C Engines, Steam Turbines and Steam condensers etc CO2. Describe the operation of air compressors, Steam Generators, Steam Turbines and Steam condensers. CO3. Apply thermodynamics laws in engineering applications like IC Engines, Air Compressors, Steam Nozzles etc CO4. Evaluate the performance of IC Engines, Air Compressors, Steam Nozzles and Steam turbines etc.
25	1803402	Fluid mechanics	CO1: Employ the basic knowledge of fluid properties. CO2: Analyze Hydraulic machines by developing mathematical models to study characteristics of various flows. CO3 :understand the mathematical techniques of practical flow problems. CO4: Understand the boundary layer theory and forces on submerged bodies
26	1803403	Kinematics of machinery	CO1: Design a suitable mechanism depending on application CO 2: understand the working principles of common mechanisms CO3: Analyze mechanism for finding its displacement, velocity, acceleration, CO4: understand different types of motions and various configurations of followers, by drawing displacement diagrams and cam profile diagram for followers
27	1803404	Basic electronics engineering	CO1: Understand the functionalities of the diodes. CO2: Analyze the performance of rectifiers. CO3: Use the transistors in various applications CO4: Understand the working of voltmeters and CROs.

28	1803405	Instrumentation and control systems	CO1. Student can select appropriate device for the measurement of parameters like temperature, pressure, speed, stress, humidity, flow velocity etc., and justify its use through characteristics and performance. CO2. Analyze the fundamentals of various types of Transducers. CO3 Implement various principles & working of Transducers CO4.Aable to understand the methods to analyze the stability of systems from transfer function forms.
29	1803406	Computer aided machine drawing	co1. Demonstrate the conventional representations of materials and machine components. co2. Create solid models and sectional views of machine components. co3. Design 3D assemblies into 2D drawings. co4. Create manufacturing drawing with dimensional and geometric tolerances.
30	1803407	Basic electronics &MOF lab	CO1: Utilize knowledge of computing CRO,diodes and rectifiers. CO2: Perform experiments on commom emitter and amplifier CO3: calibration of venturimeter,Orificemeter and Mouth piece CO4: Employ the basic knowledge of hydraulics and performance parameters of pumps
31	1803408	Environmental science	CO 1 Gain a higher level of personal involvement and interest in understanding and solving environmental problems. CO 2 Understand the interconnection of human dependence on this ecosystem. CO 3 Influence their society in proper utilization of Natural resources. CO 4 Increases critical thinking and helps in analyzing the impact of developmental activities on environment CO 5 Learn the management of environmental hazards and disasters and have a clear understanding on environmental concerns and follow sustainable developmental activities.
32	1803409	Seminar/industrial Training	

33	1803410	Advanced English communication lab	CO 1 Describe Speaking and listening skills CO 2 Understand various kinds of reports and present them schematically CO 3 Analyze Behavioural skills CO 4 Illustrate various employability skills required for the employment CO 5 Classify the verbal and non-verbal communication