



MALLAREDDY ENGINEERING COLLEGE AND MANAGEMENT SCIENCES
 (Approved by AICTE New Delhi & Affiliated to JNTU Hyderabad)

Kistapur Village, Medchal, Medchal District-501401

Department of Mechanical Engineering						
R22- COURSE OUTCOMES						
Sr. No.	Class	Regulation	Subjects	Course code	Co's	Course Outcomes
1	I/I	R22	Matrices and Calculus	MA101BS	Co-1	Write the matrix representation of a set of linear equations and to analyse the solution of the system of equations
					Co-2	Find the Eigenvalues and Eigen vectors
					Co-3	Reduce the quadratic form to canonical form using orthogonal transformations
					Co-4	Solve the applications on the mean value theorems
					Co-5	Evaluate the improper integrals using Beta and Gamma functions
2	I/I	R22	Applied Physics	PH102BS	Co-1	Understand physical world from fundamental point of view by the concepts of Quantum mechanics and visualize the difference between conductor, semiconductor, and an insulator by classification of solids.
					Co-2	Identify the role of semiconductor devices in science and engineering Applications
					Co-3	Explore the fundamental properties of dielectric, magnetic materials and energy for their applications
					Co-4	Appreciate the features and applications of Nanomaterials
					Co-5	Understand various aspects of Lasers and Optical fiber and their applications in diverse fields
3	I/I	R22	C Programming and Data Structures	ME103ES	Co-1	Understand the various steps in Program development.
					Co-2	Explore the basic concepts in C Programming Language
					Co-3	Develop modular and readable C Programs
					Co-4	Understand the basic concepts such as Abstract Data Types, Linear and Non-Linear Data structures.
					Co-5	Apply data structures such as stacks, queues in problem solving
4	I/I	R22	Engineering	ME104ES	Co-1	Study and practice on machine tools and their operations



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			Workshop		Co-2	Practice on manufacturing of components using workshop trades including plumbing, fitting, carpentry, foundry, house wiring and welding
					Co-3	Identify and apply suitable tools for different trades of Engineering processes including drilling, material removing, measuring, chiseling
					Co-4	Apply basic electrical engineering knowledge for house wiring practice
					Co-5	Practice on Block smithy of components using workshops
5	I/I	R22	English for Skill Enhancement	EN105HS	Co-1	Understand the importance of vocabulary and sentence structures
					Co-2	Choose appropriate vocabulary and sentence structures for their oral and written communication
					Co-3	Demonstrate their understanding of the rules of functional grammar
					Co-4	Develop comprehension skills from the known and unknown passages
					Co-5	Take an active part in drafting paragraphs, letters, essays, abstracts, précis and reports in various contexts
6	I/I	R22	Elements of Mechanical Engineering	ME106ES	Co-1	Understand the operation, usage and applications of different measuring instruments and tools
					Co-2	Examine the different characteristics of instruments like accuracy, precision etc
					Co-3	Prepare simple composite components and joining different materials using soldering process.
					Co-4	Identify tools & learn practically the process of turning, milling, grinding on mild steel pieces
					Co-5	Understand the basic components of IC engine, Gear box and boiler
7	I/I	R22	Applied Physics Laboratory	PH107BS	Co-1	Know the determination of the Planck's constant using Photo electric effect and identify the material whether it is n-type or p-type by Hall experiment



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					Co-2	Appreciate quantum physics in semiconductor devices and optoelectronics
					Co-3	Gain the knowledge of applications of dielectric constant
					Co-4	Understand the variation of magnetic field and behavior of hysteresis curve
					Co-5	Carried out data analysis
8	I/I	R22	C Programming and Data Structures Laboratory	ME108ES	Co-1	Develop modular and readable C Program
					Co-2	Solve problems using strings, functions
					Co-3	Handle data in files
					Co-4	Implement stacks, queues using arrays, linked lists
					Co-5	To understand and analyze various searching and sorting algorithms
9	I/I	R22	English Language and Communication Skills Laboratory	EN109HS	Co-1	Better understanding of nuances of English language through audio-visual experience and group activities
					Co-2	Speak clearly with the right accent and intonation
					Co-3	Speaking skills with clarity and confidence which in turn enhances their employability skills
					Co-4	Neutralization of accent for intelligibility
					Co-5	Understand and apply knowledge of human communication and language process.
10	I/I	R22	Environmental Science	*MC110	Co-1	Define basic definitions and can explain complex relationship between Predators, Prey and the plant community.
					Co-2	Categorize resources in natural environment and its relationships with human activities as well as human impacts.
					Co-3	Demonstrate an awareness, knowledge and appreciation of the intrinsic values of ecological processes and communities.
					Co-4	Assess different scientific research strategies, including collection, management, evaluation and interpretation of environmental data and role



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						of information technology in environment.
					Co-5	Examine the transnational character of environmental problems, protection acts and ways of addressing them, including interactions across local to global scales. Formulate an action plan for suitable alternatives that integrate science, humanist and social perspectives, for the remediation or restoration of degraded environment.
11	I/II	R22	Ordinary Differential Equations and Vector Calculus	MA201BS	Co-1	Identify whether the given differential equation of first order is exact or not
					Co-2	Solve higher differential equation
					Co-3	apply the concept of differential equation to real world problems
					Co-4	Use the Laplace transforms techniques for solving ODE's
					Co-5	Evaluate the line, surface and volume integrals and converting them from one to another
12	I/II	R22	Engineering Chemistry	CH202BS	Co-1	Students will acquire the basic knowledge of electrochemical procedures related to corrosion and its control
					Co-2	The students are able to understand the basic properties of water and its usage in domestic and industrial purposes
					Co-3	They can learn the fundamentals and general properties of polymers and other engineering materials
					Co-4	They can predict potential applications of chemistry and practical utility in order to become good engineers and entrepreneurs
					Co-5	Students are able to analyzing the various compounds based on configurational and conformational analysis of molecules and reaction mechanisms
13	I/II	R22	Computer Aided Engineering Graphics	ME203ES	Co-1	Apply computer aided drafting tools to create 2D and 3D objects
					Co-2	sketch conics and different types of solids
					Co-3	Appreciate the need of Sectional views of solids and Development of surfaces of solids
					Co-4	Read and interpret engineering drawings



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					Co-5	Conversion of orthographic projection into isometric view and vice versa manually and by using computer aided drafting
14	I/II	R22	Engineering Mechanics	ME204ES	Co-1	Determine resultant of forces acting on a body and analyse equilibrium of a body subjected to a system of forces
					Co-2	Solve problem of bodies subjected to friction
					Co-3	Find the location of centroid and calculate moment of inertia of a given section.
					Co-4	Understand the kinetics and kinematics of a body undergoing rectilinear, curvilinear, rotatory motion and rigid body motion.
					Co-5	Solve problems using work energy equations for translation, fixed axis rotation and plane motion and solve problems of vibration
15	I/II	R22	Engineering Materials	ME205PC	Co-1	Classify the various materials that will be essential for the mechanical engineering applications
					Co-2	Express the mechanical properties of metals
					Co-3	Express the their mechanical testing procedures
					Co-4	Understand the application of materials and their processing
					Co-5	Understand the requirement and need for the development of the new materials
16	I/II	R22	Python Programming Laboratory	ME206ES	Co-1	Develop the application specific codes using python.
					Co-2	Understand Strings, Lists, and Tuples
					Co-3	Understand the Dictionaries in Python
					Co-4	Verify programs using modular approach, file I/O, Python standard library
					Co-5	Implement Digital Systems using Python
17	I/II	R22	ENGINEERING CHEMISTRY LABORATORY	CH207BS	Co-1	Determination of parameters like hardness of water and rate of corrosion of mild steel in various conditions
					Co-2	Able to perform methods such as conductometry, potentiometry and pH metry in order to find out the concentrations or



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						equivalence points of acids and bases
					Co-3	Students are able to prepare polymers like bakelite
					Co-4	Students are able to prepare nylon-6
					Co-5	Estimations saponification value, surface tension and viscosity of lubricant oils
18	I/II	R22	Fuels & Lubricants Laboratory	ME208PC	Co-1	Find the kinematic viscosity of lubricants and its variation with temperature
					Co-2	Determine the flash point, fire point, cloud point and pour point of liquid fuels
					Co-3	Determine the calorific value of solid, liquid and gaseous fuels
					Co-4	Determination of the dropping point of lubricating grease
					Co-5	Determination of distillation characteristics of petroleum products
19	II/I	R22	Probability and Statistics & Complex Variables	MA301BS	Co-1	Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data
					Co-2	Apply concept of estimation and testing of hypothesis to case studies.
					Co-3	Analyze the complex function with reference to their analyticity, integration using Cauchy's integral and residue theorems.
					Co-4	Taylor's series expansions of complex function.
					Co-5	Laurent's series expansions of complex function.
20	II/I	R22	Mechanics of Solids	ME302PC	Co-1	Evaluate the internal forces, moments, stresses, strains, and deformations in structures made of various materials acted on by a variety of loads
					Co-2	Draw axial force, shear force and bending moment diagrams for beams and frames.
					Co-3	Develop the Bending and Torsion formula and apply to the design of beams and shafts
					Co-4	Use the stress transformation equations to find the state of stress at a point for various rotated positions of the stress element and display the same in graphical form as Mohr's circle.
					Co-5	Understand the different criteria for the safety of the component by



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						applying the theories of elastic failure
21	II/I	R22	Material Science and Metallurgy	ME303PC	Co-1	Memorize the types of Crystal structures and their defects
					Co-2	Learn the necessity of alloying and identify types of alloy phases
					Co-3	Demonstrate importance of critical understanding of heat treatment in achieving required properties
					Co-4	Apply the knowledge of heat treatment to enhance surface properties
					Co-5	Analyze the properties and micro structure of ferrous and non-ferrous alloys
22		R22	Production Technology	ME304PC	Co-1	Elaborate the fundamentals of various moulding, casting techniques and furnaces.
					Co-2	Identify the importance of permanent joining and principle behind different welding processes
					Co-3	Explain the concepts of solid-state welding processes
					Co-4	Understand the concepts of rolling and sheet metal operations in metal working
					Co-5	Elaborates the uniqueness of extrusion, forging and high energy rate forming processes in metal working.
23	II/I	R22	Thermodynamics	ME305PC	Co-1	Understand the basics of Thermodynamics
					Co-2	Apply first and second laws of thermodynamics to different systems
					Co-3	Determine the feasibility of a process w.r.to entropy changes
					Co-4	Apply concepts of thermodynamic property relations to ideal gas and real gases
					Co-5	Evaluate performance of power cycles and refrigeration cycles
24	II/I	R22	Production Technology Lab	ME306PC	Co-1	Analyze the given problem and conducts investigation on the experimental setup
					Co-2	Operate different types of welding machines
					Co-3	Perform operations on mechanical press.
					Co-4	Get familiarity with processing of Plastics
					Co-5	Effectively communicate and explain the experimental analysis
25	II/I	R22	Machine Drawing Practice	ME307PC	Co-1	Preparation and study of crystal models for simple cubic, body centred cubic, face centred cubic and hexagonal close packed



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					structures.	
				Co-2	Preparation and study of the Microstructure of pure metals like Iron, Cu and Al.	
				Co-3	Preparation and study of the Microstructure of Mild steels, low carbon steels, high Carbon steels.	
				Co-4	Study of the Microstructures of Various Cast Irons	
				Co-5	Study of the Microstructures of Non-Ferrous alloys. (Al, Cu, Mg)	
26	II/I	R22	Material Science and Mechanics of Solids Lab	ME308PC	Co-1	Preparation of engineering and working drawings with dimensions and bill of material during design and development. Developing assembly drawings using part drawings of machine components
					Co-2	Conventional representation of materials, common machine elements and parts such as screws, nuts, bolts, keys, gears, webs, ribs.
					Co-3	Types of sections – selection of section planes and drawing of sections and auxiliary sectional views. Parts not usually sectioned.
					Co-4	Methods of dimensioning, general rules for sizes and placement of dimensions for holes, centers, curved and tapered features.
					Co-5	Title boxes, their size, location and details – common abbreviations and their liberal usage
27	II/I	R22	Constitution of India	*MC309	Co-1	Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics
					Co-2	Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India
					Co-3	Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru.
					Co-4	Discuss the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
					Co-5	Discuss the passage of the Hindu Code Bill of 1956



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28	II/II	R22	Basic Electrical and Electronics Engineering	EE401ES	Co-1	To analyze and solve electrical circuits using network laws and theorems.
					Co-2	To understand and analyze basic Electric and Magnetic circuits
					Co-3	To study the working principles of Electrical Machines
					Co-4	To introduce components of Low Voltage Electrical Installations
					Co-5	To identify and characterize diodes and various types of transistors.
29	II/II	R22	Kinematics of Machinery	ME402PC	Co-1	Understand the various elements in mechanism and the inversions of commonly used mechanisms such as four bar, slider crank and double slider crank mechanisms
					Co-2	Draw the velocity and acceleration polygons for a given configuration of a mechanism
					Co-3	Understand the conditions for straight line motion mechanisms, steering mechanism and the usage of Hooke's joint.
					Co-4	Draw the displacement diagrams and cam profile diagram for followers executing different types of motions and various configurations of followers
					Co-5	Calculate the number of teeth and velocity ratio required for a given combination of gears
30	II/II	R22	Fluid Mechanics & Hydraulic Machines	ME403PC	Co-1	Able to explain the effect of fluid properties on a flow system.
					Co-2	Able to identify type of fluid flow patterns and describe continuity equation.
					Co-3	To analyze a variety of practical fluid flow and measuring devices and utilize Fluid Mechanics principles in design.
					Co-4	To select and analyze an appropriate turbine with reference to given situation in power plants.
					Co-5	To estimate performance parameters of a given Centrifugal and Reciprocating pump.
31	II/II	R22	IC Engines & Gas Turbines	ME404PC	Co-1	Able to explain the effect of fluid properties on a flow system
					Co-2	Able to identify type of fluid flow patterns and describe continuity equation.
					Co-3	To analyze a variety of practical fluid flow and measuring devices and utilize Fluid Mechanics principles in design.
					Co-4	To select and analyze an appropriate turbine with reference to given



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						situation in power plants.
					Co-5	To estimate performance parameters of a given Centrifugal and Reciprocating pump.
32	II/II	R22	Instrumentation and Control Systems	ME405PC	Co-1	To identify various elements and their purpose in typical instruments, to identify various errors that would occur in instruments
					Co-2	Analysis of errors so as to determine correction factors for each instrument
					Co-3	To understand dynamic characteristics of instrument and should be able to determine loading response time
					Co-4	To understand static characteristics of instrument and should be able to determine loading response time
					Co-5	For given range of displacement should be able to specify transducer, its accurate and loading time of that transducer.
33	II/II	R22	Basic Electrical and Electronics Engineering Lab	EE409ES	Co-1	To analyze and solve electrical circuits using network laws and theorems.
					Co-2	To understand and analyze basic Electric and Magnetic circuits
					Co-3	To study the working principles of Electrical Machines
					Co-4	To introduce components of Low Voltage Electrical Installations
					Co-5	To identify and characterize diodes and various types of transistors
34	II/II	R22	Fluid Mechanics and Hydraulic Machines Lab	ME407PC	Co-1	Able to explain the effect of fluid properties on a flow system
					Co-2	Able to identify type of fluid flow patterns and describe continuity equation
					Co-3	To analyze a variety of practical fluid flow and measuring devices and utilize fluid mechanics principles in design
					Co-4	To select and analyze an appropriate turbine with reference to given situation in power plants
					Co-5	To estimate performance parameters of a given Centrifugal and Reciprocating pump.
35	II/II	R22	Instrumentation and Control Systems Lab	ME408PC	Co-1	Characterize and calibrate measuring devices.
					Co-2	Identify and analyze errors in measurement.
					Co-3	Analyze measured data using regression analysis.
					Co-4	Calibration of Pressure Gauges and temperature
					Co-5	The student is also able to calibration of LVDT, capacitive transducer,



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36	II/II	R22	Real-time Research Project/ Field-Based Project	ME409PC	Co-1	To develop students' sensibility with regard to issues of gender in contemporary India
					Co-2	To provide a critical perspective on the socialization of men and women
					Co-3	To introduce students to information about some key biological aspects of genders
					Co-4	To expose the students to debates on the politics and economics of work
					Co-5	To help students reflect critically on gender violence.
37	II/II	R22	Gender Sensitization Lab	*MC410	Co-1	Students will have developed a better understanding of important issues related to gender in contemporary India.
					Co-2	Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
					Co-3	Students will attain a finer grasp of how gender discrimination works in our society and how to counter it
					Co-4	Students will acquire insight into the gendered division of labor and its relation to politics and economics.
					Co-5	Men and women students and professionals will be better equipped to work and live together as equals.