



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

L.B.Reddy Nagar, Mylavaram – 521 230, N.T.R. District, Andhra Pradesh, India

Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi

Accredited by NAAC with 'A' grade, An ISO 9001:2015 Certified Institution

DEPARTMENT OF AEROSPACE ENGINEERING

Website: <https://www.lbrce.ac.in/ase/index.php> Email: hodaero@lbrce.ac.in Phone: 08659-222933 Ext:624/623

R20 UG CO-PO-PSO MAPPING

Sem	COURSE NAME	CO No.	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
Semester I																		
	20FE01 PROFESSIONAL COMMUNICATION I	CO1	Write sentences and paragraphs using proper grammatical structures and word forms (Remember : L1).	-	-	-	2	-	-	-	-	3	3		2	-	-	
		CO2	Comprehend the given text by employing suitable strategies for skimming and scanning and draw inferences (Understand : L2).	-	1	-	2	-	1	-	-	-	3	3		2	-	-
		CO3	Write summaries of reading texts using correct tense forms & appropriate structures (Remember : L1)	-	-	-	2	-	-	-	-	-	3	3	-	2	-	-
		CO4	Write Formal Letters; Memos & E-Mails (Apply : L3).	-	1	-	2	-	1	-	-	-	3	3	-	2	-	-
		CO5	Edit the sentences/short texts by identifying basic errors of grammar/vocabulary/syntax (Understand : L2).	-	-	-	2	-	-	-	-	-	3	3	-	2	-	-
		AVG		--	1	--	2	--	1	--	--	3	3	--	2	--	--	
	20FE03 DIFFERENTIAL EQUATIONS	CO1	Apply first order and first-degree differential equations to find orthogonal trajectories (Apply : L3).	3	2	-	2	-	-	-	-	-	-	-	1	-	-	
		CO2	Distinguish between the structure and methodology of solving higher order differential equations with constant coefficients (Understand : L2).	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		CO3	Apply various Numerical methods to solve initial value problem (Apply : L3).	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		CO4	Generate the infinite series for continuous functions and investigate the functional dependence (Understand : L2).	2	1	-	1	-	-	-	-	-	-	-	-	1	-	-
		CO5	Solve partial differential equations using Lagrange method (Apply : L3).	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		AVG		3	2	--	2	--	--	--	--	--	--	--	1	--	--	
	20FE05 APPLIED CHEMISTRY	CO1	Apply Nernst Equation for calculating electrode cell potentials and compare batteries for different applications (Apply - L3).	3	2	1	2	-	2	1	-	-	-	-	2	-	-	
		CO2	Apply principles of corrosion for design and effective maintenance of various equipment (Apply - L3).	3	2	2	1	-	2	2	-	-	-	-	-	2	-	-
		CO3	Analyse the suitability of advanced materials like nano materials in electronics and medicine (Understand - L2).	3	2	2	1	-	2	1	-	-	-	-	-	2	-	-
		CO4	Identify the importance of liquid crystals, polymers in advanced technologies (Understand - L2).	3	3	2	1	-	2	1	-	-	-	-	-	2	-	-
		CO5	Apply the principles of analytical techniques in chemical analysis (Apply - L3).	3	2	2	1	-	1	1	-	-	-	-	-	2	-	-
		AVG		3	3	2	2	--	2	2	--	--	--	--	2	--	--	
SEMESTER I	20ME01 Engineering Graphics	CO1	Identify the geometrical objects considering BIS standards (Understand-L2)	2	3	1	1	1	-	-	-	-	-	-	2	3	2	
		CO2	Comprehend the basics of orthographic projections and deduce orthographic projections of a point and a line at different orientations (Understand-L2)	3	3	1	2	1	-	-	-	-	-	-	-	2	3	2
		CO3	Analyse and represent graphically the geometrical planes at different positions and orientations (Analyze-L4)	2	3	1	2	1	-	-	-	-	-	-	-	2	3	2
		CO4	Analyze and draw solid objects at different positions and orientations (Analyze-L4)	2	3	1	2	1	-	-	-	-	-	-	-	2	3	2
		CO5	Visualize isometric and orthographic views of geometrical objects and convert one form to another (Apply-L3)	3	3	3	3	2	-	-	-	-	-	-	-	2	3	2
		AVG		3	3	2	2	2	--	--	--	--	--	--	2	3	2	
	20ME02 Engineering Mechanics	CO1	Analyze the coplanar force systems using free body diagram (Analyze-L4)	3	2	2	1	-	-	-	-	-	-	-	2	2	3	
		CO2	Apply the equilibrium Equations of rigid bodies associated with frictional forces (Apply-L3)	2	3	2	1	-	-	-	-	-	-	-	-	2	2	3
		CO3	Identify the location of centroid / centre of gravity and evaluate the moment of inertia of plane sections/solids	3	2	2	1	-	-	-	-	-	-	-	-	2	2	3
		CO4	Understand the behaviour of moving bodies in rectilinear motion using kinematic equations or motion curves	2	2	2	1	-	-	-	-	-	-	-	-	2	2	3
		CO5	Examine the behaviour of moving bodies using dynamic equilibrium conditions (Apply-L3)	3	2	2	1	-	-	-	-	-	-	-	-	2	2	3
		AVG		3	3	2	1	--	--	--	--	--	--	--	2	2	3	
	20FE52 APPLIED CHEMISTRY LAB	CO1	Assess quality of water based on the procedures given (Understand - L2).	3	3	-	1	-	2	2	-	-	-	-	-	-	-	
		CO2	Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus (Understand - L2).	2	1	-	-	-	-	-	-	-	-	-	-	-	-	-
		CO3	Acquire practical knowledge related to preparation of polymers (Understand - L2).	2	-	1	-	-	-	-	-	-	-	-	-	-	-	-
		CO4	Exhibit skills in performing experiments based on theoretical fundamentals (Understand - L2)	3	2	1	-	-	-	-	-	-	-	-	-	-	-	-
				AVG		3	2	1	1	--	2	2	--	--	--	--	--	--
	20ME52 Engineering Mechanics and Fuel Testing Lab	CO1	Verify the basic laws of mechanics (Apply-L3)	2	2	1	2	-	-	-	-	-	-	-	-	2	2	
		CO2	Evaluate the forces in mechanical systems (Apply-L3)	2	2	1	2	-	-	-	-	-	-	-	-	2	2	
		CO3	Estimate various properties of fuel like viscosity, flash and fire point (Apply-L3)	2	2	1	2	-	-	-	-	-	-	-	-	2	2	
		CO4	Determine calorific-value of fuels (Apply-L3)	2	2	1	2	-	-	-	-	-	-	-	-	2	2	
				AVG		2	2	1	2	--	--	--	--	--	--	--	2	2
	20ME51 Engineering Workshop	CO1	Develop different prototypes in the carpentry section (Apply-L3)	3	2	1	1	-	-	-	-	-	-	-	2	3	2	
		CO2	Fabricate various basic prototypes in fitting trade (Apply-L3)	3	2	1	1	-	-	-	-	-	-	-	-	2	3	2
		CO3	Demonstrate various operations related to plumbing, tin smithy and black smithy (Apply-L3)	3	2	1	1	-	-	-	-	-	-	-	-	2	3	2
		CO4	Perform various basic house wiring techniques (Apply-L3)	3	2	1	1	-	-	-	-	-	-	-	-	2	3	2



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R20 UG CO-PO-PSO MAPPING

Sem	COURSE NAME	CO No.	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
		AVG		3	2	1	1	--	--	--	--	--	--	--	2	3	2	
Semester II																		
SEMESTER II	20FE02 PROFESSIONAL COMMUNICATION II	CO1	Produce a coherent paragraph interpreting a figure / graph/ chart/ table (Understand:L2)	-	-	-	2	-	-	-	-	3	3	-	2	-	-	
		CO2	Comprehend the given texts thoroughly by guessing the meanings of the words contextually. (Understand:L2)	-	1	-	2	-	1	-	-	-	3	3	-	2	-	-
		CO3	Use language appropriately for describing / comparing / contrasting / giving directions and suggestions (Remember:L1)	-	-	-	2	-	-	-	-	-	3	3	-	2	-	-
		CO4	Write formal /informal dialogues with an understanding of verbal / non verbal features of communication. guess meanings of the words from the context.(Understand:L2)	-	1	-	2	-	1	-	-	-	3	3	-	2	-	-
		CO5	Write well structured essays ; Reports and Re'sume' (Apply - L3).	-	1	-	2	-	1	-	-	-	3	3	-	2	-	-
		AVG		--	1	--	2	--	1	--	--	--	3	3	--	2	--	--
	20FE04 LINEAR ALGEBRA AND TRANSFORMATION TECHNIQUES	CO1	Investigate the consistency of equations and solve them (Analyze-L4)	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		CO2	Determine the Eigen Values, Inverse and Powers of a matrix using Cayley – Hamilton Theorem (Apply - L3)	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		CO3	Use the concepts of Laplace Transforms to various forms of functions (Apply - L3)	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		CO4	Solve Ordinary Differential Equations by using Laplace Transforms (Apply - L3)	2	1	-	1	-	-	-	-	-	-	-	-	1	-	-
		CO5	Apply Z-Transforms to solve Difference Equations (Apply - L3)	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		AVG		3	2	--	2	--	--	--	--	--	--	--	--	1	--	--
	20FE08 ENGINEERING PHYSICS	CO1	Analyse the different mechanical properties of materials(Understand – L2).	3	3	1	1	-	-	-	-	-	-	-	-	1	-	-
		CO2	Apply the lasers and optical fibres in different fields (Apply - L3).	3	2	1	1	-	-	-	-	-	-	-	-	1	-	-
		CO3	Summarize the properties of sound waves (Understand – L2).	3	3	1	1	-	-	-	-	-	-	-	-	1	-	-
		CO4	Classify the different types of magnetic and dielectric materials(Understand - L2).	3	3	1	1	-	-	-	-	-	-	-	-	1	-	-
		CO5	Identify the properties of superconducting and nano materials(Understand – L2).	3	3	1	1	-	-	-	-	-	-	-	-	1	-	-
		AVG		3	3	1	1	--	--	--	--	--	--	--	--	1	--	--
	20AE01-Elements of Aerospace Engineering	CO1	Describe functions of various external and internal components of an airplane(Understand – L2)	3	3	1	2	-	-	-	-	-	-	-	-	3	3	2
		CO2	Classify the various forces and moments acting on an airfoil(Understand – L2)	3	3	1	2	-	-	-	-	-	-	-	-	3	3	2
		CO3	Describe the working principles of various aircraft engine systems(Understand – L2).	3	3	1	2	-	-	-	-	-	-	-	-	3	3	2
		CO4	Describe the basic aspects of space flight(Understand – L2)	3	3	1	2	-	-	-	-	-	-	-	-	3	3	2
		AVG		3	3	1	2	--	--	--	--	--	--	--	--	3	3	2
	20CS01- Programming for Problem Solving using C	CO1	Familiar with syntax and semantics of the basic programming language constructs. (Understand : L2)	2	3	2	1	3	-	-	-	-	-	-	-	1	2	2
		CO2	Construct derived data types like arrays in solving problem. (Apply : L3)	2	3	2	1	3	-	-	-	-	-	-	-	1	2	2
		CO3	Decompose a problem into modules and reconstruct it using various ways of user-defined functions. (Apply : L3)	2	3	2	1	3	-	-	-	-	-	-	-	1	2	2
		CO4	Define user-defined data types like structures and unions and its applications to solve problems. (Apply : L3)	2	3	2	1	3	-	-	-	-	-	-	-	1	2	2
		CO5	Discuss various file I/O operations and its application. (Understand : L2)	2	3	2	1	3	-	-	-	-	-	-	-	1	2	2
AVG			2	3	2	1	3	--	--	--	--	--	--	--	1	2	2	
20MC01-Constitution of India	CO1	Understand history and philosophy of constitution with reference to Preamble, Fundamental Rights and Duties (Understand – L2).	-	-	-	-	-	-	3	3	3	-	2	-	3	-	-	
	CO2	Understand the concept of Unitary and Federal Government along with theroles of President, Prime Minister and Judicial System(Understand – L2).	-	-	-	-	-	-	3	2	3	-	2	-	3	-	-	
	CO3	Understand the structure of the state government, Secretariat, Governor and Chief Minister and their functions (Understand – L2).	-	-	-	-	-	-	3	3	3	-	2	-	3	-	-	
	CO4	Learn local administration viz. Panchayat, Block, Municipality and Corporation(Understand – L2)	-	-	-	-	-	-	3	2	3	-	2	-	3	-	-	
	CO5	Learn about Election Commission and the process and about SC, ST, OBC and women(Understand – L2)	-	-	-	-	-	-	3	3	3	-	2	-	3	-	-	
	AVG		--	--	--	--	--	--	3	3	3	--	2	--	3	--	--	
20FE51 PROFESSIONAL COMMUNICATION SKILLS LAB	CO1	Introduce oneself and others using appropriate language and details (Understand : L2).	-	-	-	-	-	3	-	-	-	-	3	-	2	-	-	
	CO2	Comprehend short talks and speak clearly on a specific topic using error free English(Understand : L2).	-	-	-	-	-	3	-	-	-	-	3	-	2	-	-	
	CO3	Report effectively after participating in informal discussions ethically (Remember : L1).	-	-	-	-	-	3	-	-	-	-	3	-	2	-	-	
	CO4	Interpret data aptly, ethically & make oral presentations (Apply : L3).	-	-	-	-	-	3	-	-	-	-	3	-	2	-	-	
	AVG		--	--	--	--	--	3	--	--	--	--	3	--	2	--	--	
	CO1	Analyze the wave characteristics of light(Understand – L2).	3	2	1	1	-	-	-	-	-	-	-	-	2	-	-	
	CO2	Determine the wavelength of laser source and width of slit(Apply - L3).	3	2	1	1	-	-	-	-	-	-	-	-	2	-	-	



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	20FE55 ENGINEERING PHYSICS LAB	CO3	Estimate the magnetic field using Stewart's and Gee's apparatus and the rigidity modulus of material using Torsional Pendulum(Understand - L2).	3	2	1	1	-	-	-	-	-	-	-	2	-	-	
		CO4	Identify the phenomena of resonance in strings(Understand - L2).	3	2	1	1	-	-	-	-	-	-	-	-	2	-	-
		CO5	Improve report writing skills and individual team work with ethical values(Understand - L2)	3	2	1	1	-	-	-	-	-	-	-	-	2	-	-
		AVG		3	2	1	1	--	--	--	--	--	--	--	--	2	--	--
	20CSS1 - Programming for Problem Solving using C Lab	CO1	Apply control structures of C in solving computational problems. (Apply - L3)	2	3	1	-	3	-	-	-	-	-	-	-	2	2	2
		CO2	Implement derived data types & use modular programming in problem solving. (Apply - L3)	2	3	1	-	3	-	-	-	-	-	-	-	2	2	2
		CO3	Implement user defined data types and perform file operations. (Apply - L3)	2	3	1	-	3	-	-	-	-	-	-	-	2	2	2
		CO4	Improve individual / teamwork skills, communication & report writing skills with ethical values. (Apply - L3)	2	3	1	-	3	-	-	-	-	-	-	-	2	2	2
	AVG		2	3	1	--	3	--	--	--	--	--	--	--	2	2	2	
	20ME54-Computer Aided Engineering Graphics	CO1	Understand the Auto-CAD basics and apply to solve practical problems used in industries where the speed and accuracy can be achieved(Understand - L2)	3	1	1	1	3	-	-	-	-	-	-	-	2	3	2
		CO2	Understand the principle of Orthographic projections of points, lines, planes and solids(Understand - L2).	3	1	1	1	3	-	-	-	-	-	-	-	2	3	2
		CO3	Familiarize with the sectioning of solids and development of surfaces(Apply - L3).	3	1	1	1	3	-	-	-	-	-	-	-	2	3	2
CO4		Convert orthographic to isometric vice versa(Apply - L3).	3	1	1	1	3	-	-	-	-	-	-	-	2	3	2	
AVG		3	1	1	1	3	--	--	--	--	--	--	--	2	3	2		
Semester III																		
SEMESTER III	20FE10 - NUMERICAL METHODS AND INTEGRAL CALCULUS	CO1	Estimate the best fit polynomial for the given tabulated data using Interpolation.(Understand - L2)	3	2	-	2	-	-	-	-	-	-	-	1	-	-	
		CO2	Apply numerical techniques in solving of equations and evaluation of integrals. (Apply - L3)	3	2	-	2	-	-	-	-	-	-	-	-	1	-	-
		CO3	Discriminate among Cartesian, Polar and Spherical coordinates in multiple integrals and their respective applications to areas and volumes. (Apply - L3)	3	2	-	1	-	-	-	-	-	-	-	-	1	-	-
		CO4	Generate the single valued functions in the form of Fourier series and obtain Fourier series representation of periodic function. (Apply - L3)	3	1	-	1	-	-	-	-	-	-	-	-	1	-	-
		CO5	Evaluate the directional derivative, divergence and angular velocity of a vector function. (Apply - L3)	3	1	-	1	-	-	-	-	-	-	-	-	1	-	-
	AVG		3	2	--	2	--	--	--	--	--	--	--	--	1	--	--	
	20EE02 - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING	CO1	Apply network reduction techniques to simplify electrical circuits. (Apply-L3)	3	2	1	1	-	-	-	-	-	-	-	-	1	1	-
		CO2	Illustrate the working principle of DC machines and transformers. (Understand-L2)	3	2	1	1	-	-	-	-	-	-	-	-	1	1	-
		CO3	Understand V-I characteristics of semiconductor devices. (Understand-L2)	3	2	1	1	-	-	-	-	-	-	-	-	1	1	-
		CO4	Illustrate the configuration of Transistors and their applications. (Understand-L2)	3	2	1	1	-	-	-	-	-	-	-	-	1	1	-
	AVG		3	2	1	1	--	--	--	--	--	--	--	--	1	1	--	
	20AE02 - ENGINEERING FLUID MECHANICS	CO1	Analyze the forces acting on objects submerged in fluids under static conditions (Analyze-L4)	3	2	2	2	-	-	-	-	-	-	-	-	2	2	2
		CO2	Apply differential relations to characterize the behavior of fluid flow (Apply-L3)	3	3	3	2	-	-	-	-	-	-	-	-	2	3	3
		CO3	Apply the conservation laws to solve elementary fluid flow problems(Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		CO4	Analyze the simple pipe network for fluid transportation (Analyze-L4)	3	2	3	2	-	-	-	-	-	-	-	-	2	2	2
		CO5	Analyze the performance of various hydraulic turbines and pumps (Analyze-L4)	3	2	2	2	-	-	-	-	-	-	-	-	2	2	2
	AVG		3	3	3	3	--	--	--	--	--	--	--	--	2	3	3	
	20AE03 - ENGINEERING THERMODYNAMICS	CO1	Describe the thermodynamic properties of various systems (Understand-L2)	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3
		CO2	Apply the laws of thermodynamics to analyze various thermal systems.(Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		CO3	Analyze the entropy change of various processes.(Analyze-L4)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3
CO4		Analyze the properties of different gas mixtures and pure substances. (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
CO5		Analyze ideal gas power cycles and refrigeration cycle to estimate various performance parameters (Analyze-L4)	2	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
AVG		3	3	3	3	--	--	--	--	--	--	--	--	3	3	3		
20AE04 - STRENGTH OF MATERIALS	CO1	Analyze the stress and strain behaviour in different types of members under various load conditions (Analyze-L4)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3	
	CO2	Evaluate stress, shear force, bending moment, deflection for beams and torsion for circular shafts under different loading conditions (Apply-L3)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3	
	CO3	Evaluate shear stress distributions over different cross sections (Apply-L3)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3	
	CO4	Apply the failure theories on structural members (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
	CO5	Analyze internal stresses due to internal pressures in thin and thick cylindrical shells.(Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	



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	20MC02 - ENVIRONMENTAL SCIENCE	CO1	Identify environmental problems arising due to engineering and technological activities that help to be the part of sustainable solutions. (Remember - L1)	-	-	-	-	-	2	-	-	-	-	-	2	-	-	
		CO2	Evaluate local, regional and global environmental issues related to resources and their sustainable management. (Understand - L2)	-	-	-	-	-	2	-	-	-	-	-	2	-	-	
		CO3	Realize the importance of ecosystem and biodiversity for maintaining ecological balance. (Understand - L2)	-	-	-	-	-	2	-	-	-	-	-	2	-	-	
		CO4	Acknowledge and prevent the problems related to pollution of air, water and soil. (Apply - L3)	-	-	-	-	-	2	-	-	-	-	-	2	-	-	
		CO5	Identify the significance of implementing environmental laws and abatement devices for environmental management. (Understand - L2)	-	-	-	-	-	-	-	3	-	-	-	-	2	-	-
		AVG			--	--	--	--	--	2	3	--	--	--	--	2	--	--
	20EE52 - BASIC ELECTRICAL AND ELECTRONICS ENGINEERING LAB	CO1	Examine electrical circuits using network theorems. (Apply-L3)	3	2	-	-	2	-	-	-	-	-	-	1	2	2	
		CO2	Analyze VI characteristics of semiconductor devices. (Analyze-L4)	3	2	-	-	2	-	-	-	-	-	-	1	2	2	
		CO3	Analyze electrical circuits.(Analyze-L4)	3	2	-	-	2	-	-	-	-	-	-	1	2	2	
		CO4	Design Resonance circuits. (Apply-L3)	3	2	-	-	2	-	-	-	-	-	-	1	2	2	
		AVG			3	2	--	--	2	--	--	--	--	--	1	2	2	
	20AE51 - ENGINEERING FLUID MECHANICS LAB	CO1	Apply the principles Fluid mechanics in discharge measuring devices used in pipes channels and tanks (Apply-L3)	3	3	2	1	-	-	-	-	-	-	-	2	2	2	
		CO2	Analyze the performance of various hydraulic machines (Analyze-L4)	3	3	2	1	-	-	-	-	-	-	-	2	2	2	
		AVG			3	3	2	1	--	--	--	--	--	--	2	2	2	
	20AE52 - STRENGTH OF MATERIALS LAB	CO1	Analyze the various materials under different equilibrium loading conditions. (Analyze-L4)	3	3	2	1	-	-	-	-	-	-	-	2	2	2	
		CO2	Perform tests and analyze materials subjected to tension, torsion, bending, and bucking (Apply-L3)	3	3	2	1	-	-	-	-	-	-	-	2	3	3	
		AVG			3	3	2	1	--	--	--	--	--	--	2	3	3	
	20AES1-ADVANCED AUTOCAD	CO1	Draw objects using functional tools in AutoCAD. (Understand-L2)	3	-	-	-	3	-	-	-	-	-	-	2	3	2	
		CO2	Create blocks and attributes using AutoCAD. (Apply-L3)	3	-	-	-	3	-	-	-	-	-	-	2	3	2	
		CO3	Develop Layout Viewports and Dimensioning in Layouts using Auto-CAD. (Apply-L3)	3	-	-	-	3	-	-	-	-	-	-	2	3	2	
		CO4	Draw Template Drawing Using Drawing Templatesusing AutoCAD. (Understand-L2)	3	-	-	-	3	-	-	-	-	-	-	2	3	2	
		AVG			3	--	--	--	3	--	--	--	--	--	2	3	2	
Semester IV																		
	20FE09 - PROBABILITY AND STATISTICS	CO1	Understand various probabilistic situations using the various laws of probability and random variables (Understand - L2)	2	2	1	2	-	-	-	-	-	-	-	1	-	-	
		CO2	Apply probability distributions like Binomial, Poisson, Normal and Exponential distributions in solving engineering problems (Apply - L3)	2	2	1	2	-	-	-	-	-	-	-	1	-	-	
		CO3	Calculate the standard error of sampling distribution and confidence intervals for parameters like mean and proportion based on the sample data. (Apply - L3)	2	2	1	2	-	-	-	-	-	-	-	1	-	-	
		CO4	Analyze the data scientifically with the appropriate statistical methodologies to apply the suitable test of hypothesis (Analyze - L4)	2	2	1	2	-	-	-	-	-	-	-	1	-	-	
		CO5	Construct the regression lines to predict the dependent variables and calculate the Correlation Coefficient for a bivariate statistical data.(Apply - L3)	2	2	1	2	-	-	-	-	-	-	-	1	-	-	
		AVG			2	2	1	2	--	--	--	--	--	--	1	--	--	
	20AE05 - AEROSPACE MATERIALS AND MANUFACTURING	CO1	Estimate the properties of the metals and alloys based on structures. (Understand-L2)	3	-	2	2	-	-	-	-	-	-	-	1	3	3	
		CO2	Classify, construct and analyze equilibrium diagrams, various ferrous, non-ferrous metals and alloys. (Understand-L2)	3	-	2	2	-	-	-	-	-	-	-	1	3	3	
		CO3	Acquire knowledge of the basic aspects of casting process.(Understand-L2)	3	-	2	2	-	-	-	-	-	-	-	1	3	3	
		CO4	Know the various basic concepts of welding process, metal forming process and sheet metal operations in the manufacturing of products.(Understand-L2)	3	-	2	2	-	-	-	-	-	-	-	1	3	3	
		CO5	Know different conventional and unconventional machining processes while manufacturing a product. (Understand-L2)	3	-	2	2	-	-	-	-	-	-	-	1	3	3	
	AVG			3	--	2	2	--	--	--	--	--	--	1	3	3		
	20AE06 - AERODYNAMICS	CO1	Apply Laplace equation for obtaining 2D and axisymmetric solutions. (Apply-L3)	3	2	3	3	-	-	-	-	-	-	-	2	3	3	
		CO2	Apply conformal transformation to from aerodynamic shapes. (Apply-L3)	3	2	2	3	-	-	-	-	-	-	-	2	3	3	
		CO3	Apply potential flow theory to solve for airfoil characteristics.(Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	2	3	3	
		CO4	Apply the Prandtl's lifting line theory to predict finite wing properties.(Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	2	3	3	



R20 UG CO-PO-PSO MAPPING

Sem	COURSE NAME	CO No.	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
SEMESTER IV	20AE07 - AIRCRAFT STRUCTURES - I	CO5	Analyze the effect of boundary layer on flow over objects. (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	2	3	3	
		AVG		3	3	3	3	--	--	--	--	--	--	--	2	3	3	
		CO1	Solve problems related to elastic members by applying stress-strain relations (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		CO2	Analyze the behavior of beams, frames and trusses under various loading conditions (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		CO3	Analyze the statically indeterminate structures under various loading conditions (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		CO4	Evaluate the strain energy stored in the structural members (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		CO5	Analyze the buckling of columns and compressive member under various loading(Analyze-L4).	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
	AVG		3	3	3	3	--	--	--	--	--	--	--	--	2	3	3	
	20HS01 – UNIVERSAL HUMAN VALUES 2: UNDERSTANDING HARMONY	CO1	Apply the value inputs in life and profession (Apply – L3)	-	-	-	-	-	-	3	-	-	-	-	-	3	-	-
		CO2	Distinguish between values and skills, happiness and accumulation of physical facilities, the self, and the Body (Understand – L2)	-	-	-	-	-	-	3	-	-	-	-	-	3	-	-
		CO3	Understand the role of a human being in ensuring harmony in society (Understand – L2)	-	-	-	-	-	-	-	-	-	-	3	-	3	-	-
		CO4	Understand the role of a human being in ensuring harmony in the nature and existence. (Understand – L2)	-	-	-	-	-	-	-	-	-	-	3	-	3	-	-
		CO5	Distinguish between ethical and unethical practices (Apply – L3)	-	-	-	-	-	-	-	-	3	-	-	-	-	-	-
		AVG		--	--	--	--	--	--	3	--	3	--	3	--	3	--	--
	20AE53 - MANUFACTURING TECHNOLOGY LAB	CO1	Design and develop a product using casting (Apply-L3)	3	1	1	1	-	-	-	-	-	-	-	-	1	2	3
		CO2	Fabricate machine components with suitable welding, lathe and other machining operations (Apply-L3)	3	1	1	1	-	-	-	-	-	-	-	-	1	2	3
		CO3	Manufacture plastic components using various plastic processing techniques (Apply-L3).	3	1	1	1	-	-	-	-	-	-	-	-	1	2	3
		AVG		3	1	1	1	--	--	--	--	--	--	--	--	1	2	3
	20AE54 - THERMAL ENGINEERING LAB	CO1	Estimate various fuel characteristics through experimental testing(Apply-L3)	3	2	3	1	-	-	-	-	-	-	-	-	1	2	1
		CO2	Analyze the performance characteristics of Internal Combustion Engines (Analyze-L4)	3	2	3	1	-	-	-	-	-	-	-	-	1	2	1
		CO3	Evaluate the performance parameters of refrigeration and air conditioning systems(Apply-L3)	3	2	3	1	-	-	-	-	-	-	-	-	1	2	1
		AVG		3	2	3	1	--	--	--	--	--	--	--	--	1	2	1
	20AE55 - MATLAB APPLICATIONS IN ENGINEERING LAB	CO1	Apply the basic MATLAB operations in basic engineering problems (Apply-L3)	3	3	2	1	3	-	-	-	-	-	-	-	3	3	2
		CO2	Solve the system of linear algebraic equation using matrix operation (Apply-L3)	3	3	2	2	3	-	-	-	-	-	-	-	3	3	2
CO3		Apply the graphical user interface to write the code as more user friendly(Apply-L3)	3	3	2	1	3	-	-	-	-	-	-	-	3	3	2	
AVG			3	3	2	2	3	--	--	--	--	--	--	--	3	3	2	
20ITS1-PROBLEM SOLVING USING PYTHON	CO1	Identify various programming constructs available in Python and apply them in solving computational problems. (Apply - L3)	3	3	2	-	3	-	-	-	-	-	-	-	2	2	2	
	CO2	Demonstrate data structures available in Python and apply them in solving computational problems. (Apply - L3)	3	3	2	-	3	-	-	-	-	-	-	-	2	2	2	
	CO3	Implement modular programming, string manipulations and Python Libraries (Apply - L3)	3	3	2	-	3	-	-	-	-	-	-	-	2	2	2	
	AVG		3	3	2	--	3	--	--	--	--	--	--	--	2	2	2	
Semester V																		
	20AE08- AIRCRAFT SYSTEMS AND INSTRUMENTS	CO1	Identify the various types of controls in the airplane design (Understand-L2)	3	1	1	1	-	-	-	-	-	-	-	3	2	3	
		CO2	Understand the performance of hydraulic and pneumatic systems in the aircraft operation (Understand-L2)	3	1	1	1	-	-	-	-	-	-	-	-	3	2	3
		CO3	Analyze the performance of various engine systems of an aircraft (Analyze-L4)	3	1	1	1	-	-	-	-	-	-	-	-	3	2	3
		CO4	Employ necessary auxiliary systems in the operation of an aircraft (Apply-L3)	3	1	1	1	-	-	-	-	-	-	-	-	3	2	3
		CO5	Employ various instruments necessary of the aircraft operation (Apply-L3)	3	1	1	1	-	-	-	-	-	-	-	-	3	2	3
	AVG		3	1	1	1	--	--	--	--	--	--	--	--	3	2	3	
	20AE09- GAS DYNAMICS	CO1	Apply the of compressible fluid flow equations solve flow problems (Apply-L3)	3	2	2	2	-	-	-	-	-	-	-	-	3	3	3
		CO2	Apply the steady one-dimensional flow principles in designing the nozzles and diffusers(Apply-L3)	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3
		CO3	Analyze the supersonic flow behaviour over objects (Analyze-L4)	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3
		CO4	Analyze fluid flow through ducts by considering friction and heat transfer affects (Analyze-L4)	3	2	2	3	-	-	-	-	-	-	-	-	3	3	3
CO5		Apply compressible flow theory to analyze flow over wings (Apply-L3)	3	2	2	3	-	-	-	-	-	-	-	-	3	3	3	
AVG		3	3	2	3	--	--	--	--	--	--	--	--	3	3	3		
		CO1	Assess the behaviour of beam structures subjected to different loading conditions (Apply-L3)	3	2	2	2	-	-	-	-	-	-	-	2	2	3	
		CO2	Estimate the shear flow distribution and location of shear centre for open sections (Apply-L3)	3	3	2	2	-	-	-	-	-	-	-	-	2	2	3



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Sem	COURSE NAME	CO No.	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
SEMESTER V	20AE10- AIRCRAFT STRUCTURES – II	CO3	Determine the shear flow distribution and location of shear centre in closed section beams (Apply-L3)	3	3	2	2	-	-	-	-	-	-	-	3	3	3	
		CO4	Formulate the relations for thin plates subjected to bending and buckling loads (Apply-L3)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3
		CO5	Analyze the behaviour of bending and shear flow over aircraft wing and fuselage cross-sections (Analyze-L4)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3
		AVG		3	3	3	2	--	--	--	--	--	--	--	--	3	3	3
	20AE11- INDUSTRIAL AERODYNAMICS	CO1	Analyze the aerodynamics effects on wind turbines, buildings and its ventilation (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		CO2	Analyze the effects of aerodynamics in automobiles (Analyze-L4)	3	3	2	3	-	-	-	-	-	-	-	-	2	3	3
		CO3	Analyze the effects of wind and flow induced vibrations over objects (Analyze-L4)	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3
		CO4	Apply the effects of aerodynamics in flapping wing vehicles (Apply-L3)	3	2	2	2	-	-	-	-	-	-	-	-	2	3	3
	AVG		3	3	3	3	--	--	--	--	--	--	--	--	3	3	3	
	20AE12- FINITE ELEMENT METHODS IN ENGINEERING	CO1	Identify mathematical model for solution of common engineering problems (Understand-L2)	3	3	2	1	-	-	-	-	-	-	-	-	2	3	3
		CO2	Analyze structural behavior of Plane Truss Elements (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		CO3	Determine the design quantities (deformation, strain, stress) for engineering structures under different loading conditions (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		CO4	Formulate new solutions for the existing problems using FEM approaches (Apply-L3)	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3
		CO5	Estimate natural frequencies of bar and beam structures (Apply-L3)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3
	AVG		3	3	3	3	--	--	--	--	--	--	--	--	3	3	3	
	20AE13- UAV SYSTEM DESIGN	CO1	Understand the basic needs to design UAV and MAV (Understand-L2)	3	1	1	-	-	3	-	-	-	-	-	-	3	3	3
		CO2	Acquire the knowledge and importance of payload integration with UAV airframe (Understand-L2)	3	1	1	-	-	2	-	-	-	-	-	-	3	3	3
		CO3	Understand the advanced concept of UAV and MAV system design to the engineers (Understand-L2)	3	1	1	-	-	2	-	-	-	-	-	-	3	3	3
		CO4	Analyze the Performance of UAVs and MAVs subsystems for stable fly (Analyze-L4)	3	2	3	-	-	3	-	-	-	-	-	-	3	3	3
	AVG		3	2	2	--	--	3	--	--	--	--	--	--	3	3	3	
20AE56- AERODYNAMICS LAB	CO1	Analyze the flow characteristics over aerodynamic bodies (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
	CO2	Analyze nozzle flow characteristics (Analyze-L4)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
	AVG		3	3	3	3	--	--	--	--	--	--	--	--	3	3	3	
20AE57- AIRCRAFT STRUCTURES LAB	CO1	Analyze beam structures subjected to different loading conditions (Analyze-L4)	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3	
	CO2	Analyze deflection based on different theories (Analyze-L4)	2	3	2	3	-	-	-	-	-	-	-	-	3	3	3	
	CO3	Analyze the performance of governors and gyroscope (Analyze-L4)	2	3	2	3	-	-	-	-	-	-	-	-	3	3	3	
	AVG		3	3	2	3	--	--	--	--	--	--	--	--	3	3	3	
20AES2- COMPONENT MODELLING USING CATIA	CO1	Draw, modify and constrain sketches (Apply-L3)	3	2	-	-	3	-	-	-	-	2	-	-	2	3	3	
	CO2	Model and assemble various components (Apply-L3)	3	2	-	-	3	-	-	-	-	2	-	-	2	3	3	
	AVG		3	2	--	--	3	--	--	--	--	2	--	--	2	3	3	
20PI01-SUMMER INTERNSHIP	CO1	Work in real time situations in industries through hands on job execution(Apply- L3).	3	3	3	3	3	2	-	3	3	2	2	2	3	3	3	
	CO2	Apply theoretical aspects to solve engineering problems in the industries(Apply- L3).	3	3	3	2	3	2	-	-	3	-	2	3	3	3	3	
	AVG		3	3	3	3	3	2	--	3	3	2	2	3	3	3		
Semester VI																		
20AE14- ELEMENTS OF HEAT TRANSFER	CO1	Formulate heat conduction phenomenon through plane, cylindrical surfaces (Apply- L3)	3	2	2	2	-	-	-	-	-	-	-	-	2	3	3	
	CO2	Analyze steady state heat conduction in planes walls and cylindrical shells (Analyze-L4)	3	2	3	2	-	-	-	-	-	-	-	-	2	3	3	
	CO3	Analyze the convective heat transfer phenomenon in both external and internal flows (Analyze-L4)	3	3	2	3	-	-	-	-	-	-	-	-	2	3	3	
	CO4	Understand the thermal radiation concepts (Understand-L2)	3	1	2	2	-	-	-	-	-	-	-	-	2	3	3	
	CO5	Apply the heat transfer principles on the working of heat exchangers and electronic equipment (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3	
	AVG		3	3	3	3	--	--	--	--	--	--	--	--	2	3	3	
20AE15- FLIGHT DYNAMICS	CO1	Determine thrust and power requirement conditions for steady level flight (Apply-L3)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	2	
	CO2	Estimate performance parameters of flight during manoeuvring (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
	CO3	Apply the conditions of static stability and control in the aircraft design (Apply-L3)	3	2	3	3	-	-	-	-	-	-	-	-	3	3	3	
	CO4	Understand various concepts and conditions of dynamic stability and control (Understand-L2)	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3	
	CO5		3	3	2	2	-	-	-	-	-	-	-	-	3	3	2	
AVG		3	3	3	3	--	--	--	--	--	--	--	--	3	3	3		



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

L.B.Reddy Nagar, Mylavaram – 521 230, N.T.R. District, Andhra Pradesh, India

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DEPARTMENT OF AEROSPACE ENGINEERING

Website: <https://www.lbrce.ac.in/ase/index.php> Email: hodaero@lbrce.ac.in Phone:08659-222933 Ext:624/623

R20 UG CO-PO-PSO MAPPING

Sem	COURSE NAME	CO No.	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
SEMESTER VI	20AE16- AIR BREATHING PROPULSION	CO1	Determine the performance parameters of various jet engines (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	3	3	3	
		CO2	Analyze flow thorough subsonic and supersonic inlets (Analyze-L4)	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3
		CO3	Estimate the performance parameters of aircraft compressor (Apply-L3)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		CO4	Identify the parameters governing the working of combustion chambers (Understand-L2)	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		CO5	Determine the performance parameters of turbines of jet engines (Apply-L3)	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3
	AVG			3	3	3	3	--	--	--	--	--	--	--	3	3	3	
	20AE17 – INTRODUCTION TO COMPUTATIONAL FLUID DYNAMICS	CO1	Formulate the governing equations of fluid dynamics (Apply-L3)	3	2	2	2	-	-	-	-	-	-	-	-	2	3	3
		CO2	Apply the discretization techniques to governing equations of fluid dynamics (Apply-L3)	3	3	2	2	-	-	-	-	-	-	-	-	2	3	3
		CO3	Understand various CFD techniques (Understand-L2)	3	2	3	2	-	-	-	-	-	-	-	-	2	3	3
		CO4	Apply various CFD techniques to solve fluid dynamic problems (Apply-L3)	3	2	2	2	3	-	-	-	-	-	-	-	2	3	3
		AVG			3	3	3	2	3	--	--	--	--	--	--	2	3	3
	20AE18- VISCOUS FLOWS	CO1	Formulate fundamental equations of viscous flow [Apply-L3]	3	2	2	1	-	-	-	-	-	-	-	-	2	3	2
		CO2	Apply the viscous flow equations to solve fluid flow problems [Apply-L3]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	2
		CO3	Analyze laminar and turbulent boundary layer flow fields of objects [Analyze-L4]	3	3	2	1	-	-	-	-	-	-	-	-	3	3	2
		CO4	Describe the properties of compressible boundary layer flow [Understand-L2]	3	2	2	1	-	-	-	-	-	-	-	-	2	3	2
		AVG			3	3	2	2	--	--	--	--	--	--	--	3	3	2
	20AE19- AIRPORT DESIGN	CO1	Acquire the concept of air traffic rules and clearance procedures for airline operation [Understand-L2]	3	2	2	-	-	-	-	-	-	-	-	-	2	3	3
		CO2	Analyze the various air traffic data for air traffic services [Analyze-L4]	3	3	2	-	-	-	-	-	-	-	-	-	3	3	3
		CO3	Analyze the influence of aerodrome design factors for service establishments [Analyze- L4]	3	3	2	-	-	-	-	-	-	-	-	-	3	3	3
		AVG			3	3	2	--	--	--	--	--	--	--	--	3	3	3
		20AE58- AIRCRAFT DESIGN LAB	CO1	Estimate design parameters of an aircraft system, component, or process as per the requirement [Apply- L3]	3	3	3	2	3	-	-	-	-	-	-	-	2	3
	CO2		Calculate design parameters of an aircraft as per the assigned specifications [Apply-L3]	3	3	3	3	3	-	-	-	-	-	-	-	3	3	3
	AVG				3	3	3	3	3	--	--	--	--	--	--	3	3	3
	20AE59- PROPULSION LAB	CO1	Estimate the performance parameters of various jet engine components [Apply-L3]	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3
CO2		Characterize the wall and free jet [Apply-L3]	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3	
CO3		Prepare various solid propellant grains [Apply-L3]	3	3	2	3	--	--	--	--	--	--	--	--	3	3	3	
AVG																		
20AE60- AIRCRAFT COMPONENT MODELLING AND ANALYSIS LAB	CO1	Draw aircraft components 3D geometric modeling [Understand-L2]	3	2	3	2	3	-	-	-	-	-	-	-	2	3	3	
	CO2	Solve and analyze the structural components of aircraft for deformations and stresses using a numerical tool [Analyze-L4]	3	3	3	3	3	-	-	-	-	-	-	-	3	3	3	
	AVG			3	3	3	3	3	--	--	--	--	--	--	3	3	3	
20HSS1- SOFT SKILLS (SOC)	CO1	Develop self-awareness and personality traits for professional growth (Understand – L2)	-	-	-	-	-	3	1	3	3	3	-	-	2	-	2	
	CO2	Work effectively in multi-disciplinary and heterogeneous teams through knowledge of teamwork, Inter-personal relationships, conflict management and leadership quality. (Apply – L3)	-	-	-	-	-	3	1	3	3	3	-	-	2	-	2	
	CO3	Communicate through verbal/oral communication with good listening skills and empathy (Apply – L3)	-	-	-	-	-	-	-	-	2	3	-	-	3	-	3	
	CO4	Apply skills required to qualify in recruitment tests, Interviews & other professional assignments (Apply – L3)	-	-	-	-	-	3	-	3	3	3	-	-	2	-	3	
	AVG			--	--	--	--	--	3	1	3	3	3	--	3	--	3	
Semester VII																		
20AE20– HELICOPTER AERODYNAMICS	CO1	Understand the functions of various components of helicopter [Understand-L2]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	
	CO2	Apply momentum theory in the design of propeller [Apply-L3]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	
	CO3	Analyze the performance of helicopter in various operating conditions [Analyze-L4]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	
	CO4	Analyze the stability modes of helicopter [Analyze-L4]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	
	AVG			3	3	2	2	--	--	--	--	--	--	--	3	3	3	
20AE21-COMBUSTION IN AEROSPACE VEHICLES	CO1	Understand the basic concepts of propulsion unit [Understand-L2]	3	3	1	1	-	-	-	-	-	-	-	-	2	3	2	
	CO2	Analyze the various factors effecting the combustion process in aircraft engines-piston and jet engines [Analyze-L4]	3	3	2	2	-	-	-	-	-	-	-	-	2	3	3	
	CO3	Analyze the various combustion models of rocket engines [Analyze-L4]	3	3	3	3	-	-	-	-	-	-	-	-	3	3	2	
	CO4	Analyze the reaction and mixing process in supersonic combustion [Analyze-L4]	3	3	2	3	-	-	-	-	-	-	-	-	3	3	3	



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

L.B.Reddy Nagar, Mylavaram – 521 230, N.T.R. District, Andhra Pradesh, India

Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi

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DEPARTMENT OF AEROSPACE ENGINEERING

Website: <https://www.lbrce.ac.in/ase/index.php> Email: hodaero@lbrce.ac.in Phone:08659-222933 Ext:624/623

R20 UG CO-PO-PSO MAPPING

Sem	COURSE NAME	CO No.	COURSE OUTCOMES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	
SEMESTER VII	20AE22 - MECHANICS OF COMPOSITES	AVG		3	3	2	3	--	--	--	--	--	--	--	3	3	3	
		CO1	Understand stress-strain relations of orthotropic materials [Understand-L2]	3	3	3	2	-	-	-	-	-	-	-	-	2	2	2
		CO2	Analyze properties of composite lamina at micro level and macro level [Analyze-L4]	3	3	3	2	-	-	-	-	-	-	-	-	2	3	2
		CO3	Analyze characteristics of layered composites [Analyze-L4]	3	3	3	2	-	-	-	-	-	-	-	-	2	3	2
		CO4	Understand the nomenclature of sandwich structures [Understand-L2]	3	3	3	2	-	-	-	-	-	-	-	-	2	3	2
		CO5	Apply techniques of fabrication processes to manufacture composites [Apply-L3]	2	2	2	2	-	-	-	-	-	-	-	-	2	2	2
	20AE23- INTRODUCTION TO SPACE TECHNOLOGY	AVG			3	3	3	2	--	--	--	--	--	--	--	2	3	2
		CO1	Understand the basics of launching satellites in space [Understand-L2]	3	1	1	1	-	-	-	-	-	-	-	-	2	3	3
		CO2	Understand the orbital mechanics and it's maneuvering [Understand-L2]	3	3	3	2	-	-	-	-	-	-	-	-	2	3	3
		CO3	Understand the basic aspects of trajectories of rockets and missiles [Understand-L2]	3	3	3	2	-	-	-	-	-	-	-	-	2	3	3
		CO4	Analyze the dynamics of spacecraft attitude [Analyze-L4]	3	3	3	2	-	-	-	-	-	-	-	-	2	2	3
		AVG			3	3	3	2	--	--	--	--	--	--	--	2	3	3
	20AE24-SPACE VEHICLE PROPULSION	CO1	Understand the working of ramjet and scram jet engines [Understand-L2]	3	3	3	2	-	-	-	-	-	-	-	-	3	2	3
		CO2	Evaluate the preliminary parameters of rocket propulsion. [Apply-L3]	3	3	2	1	-	-	-	-	-	-	-	-	2	2	3
		CO3	Understand the working of liquid and solid propellant rocket systems [Understand-L2]	3	3	3	2	-	-	-	-	-	-	-	-	3	3	3
		CO4	Apply the advanced rocket propulsion techniques for a mission [Apply-L3]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3
		AVG			3	3	3	1	-	-	-	-	-	-	-	3	3	3
		CO1	Analyze the effects of vortex induced vibration on aircraft wing [Analyze-L4]	3	3	3	2	--	--	--	--	--	--	--	--	3	3	3
	20AE25 - AEROELASTICITY	CO2	Design the aircraft wing by considering effects of flow induced vibration [Apply-L3]	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		CO3	Analyze aeroelastic phenomena in aircraft wing [Analyze-L4]	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		CO4	Analyze aeroelastic phenomenon in various applications [Analyze-L4]	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3
		AVG			3	3	3	3	--	--	--	--	--	--	--	3	3	3
		CO1	Employ the wind tunnels for aerodynamic testing of bodies [Apply-L3]	3	2	2	2	-	-	-	-	-	-	-	-	2	3	3
		CO2	Adopt and use a visualization technique to understand the flow field [Apply-L3]	3	3	2	3	-	-	-	-	-	-	-	-	2	3	3
	20AE26-INSTRUMENTATION, MEASUREMENTS AND EXPERIMENTS IN FLUIDS	CO3	Employ the suitable instrument to measure the velocity, temperature and pressure of fluid flow. [Apply-L3]	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		CO4	Acquire experimental data and to estimate the uncertainty in measured values during experimentation [Apply-L3]	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3
		AVG			3	3	3	3	--	--	--	--	--	--	--	2	3	3
		CO1	Understand the characteristics of aircraft fuels [Understand-L2]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3
CO2		Understand the characteristics of solid propellants used in rockets [Understand-L2]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	
CO3		Understand the characteristics of liquid propellants used in rockets [Understand-L2]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	
20AE27 - PROPELLANT TECHNOLOGY	CO4	Understand the properties of cryogenic propellants [Understand-L2]	3	3	2	2	-	-	-	-	-	-	-	-	3	3	3	
	CO5	Test the propellants to estimate their characteristics [Apply-L3]	3	3	2	1	-	-	-	-	-	-	-	-	3	3	3	
	AVG			3	3	2	2	--	--	--	--	--	--	--	3	3	3	
	CO1	Understand the basic aspects of space [Understand-L2]	3	3	1	1	-	-	-	-	-	-	-	-	2	2	3	
	CO2	Evaluate trajectory details of ballistic missiles [Analyze-L4]	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3	
	CO3	Apply N-body aspects in space exploration issues [Apply-L3]	3	3	3	3	-	-	-	-	-	-	-	-	3	3	3	
20AE28-SPACE MECHANICS	CO4	Know the general aspects satellite injection and orbit perturbations [Understand-L2]	3	3	1	1	-	-	-	-	-	-	-	-	2	3	3	
	CO5	Evaluate interplanetary trajectories of spacecraft [Analyze-L4]	3	3	3	3	-	-	-	-	-	-	-	-	2	3	3	
	AVG			3	3	3	3	--	--	--	--	--	--	--	3	3	3	
	CO1	Apply management principles to the particle situations to be in a position to know which type of business organisation structure suits[Apply-L3]	-	-	-	-	-	-	3	3	1	3	1	3	2	-	2	
	CO2	Make decision making relating to the problems in operations and production activities thereby improving the productivity by proper utilisation input factors by designing the better working methods and with better work study techniques.[Understand-L2]	-	-	-	-	-	-	-	-	2	2	1	3	3	-	2	
	CO3	Understand quality control techniques for improvement of quality and to make decision making relating to reduce the investment in materials through better control of inventory[Understand-L2]	-	-	-	-	-	-	-	-	2	2	1	3	3	-	2	
20HS02-MANAGEMENT SCIENCE FOR ENGINEERS	CO4	Manage people in working environment with the practices of HRM across corporate businesses[Understand-L2]	-	-	-	-	-	-	-	-	3	3	3	3	3	-	2	

