ADITYA ENGINEERING COLLEGE

An Autonomous Institutuion

Approved by AICTE • Permanently Affiliated to JNTUK • Accredited by NAAC with 'A' Grade

Recognised by UGC under sections 2(f) and 12(B) of UGC Act, 1956

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Department of Electrical and Electronics Engineering

B.Tech AR17 Course Articulation Matrix

Note: Correlation Levels are 1 or 2 or 3. Where 1 Slight(Low), 2 Moderate(Medium), 3 Substantial (High).

	CO Statements	POs												PSOs	
I SEM															
Course Code	**171HS1T01 - ENGLISH – I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize how Gandhi grew in introspection and the conditions to achieve a higher quality of life, strength and sovereignty of a developed nation.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO2	Identify that all men can come together and avert the peril.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	Comprehend texts from a literary perspective and familiarise the students with Figures of Speech.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO4	Explain the characteristic traits of renowned scientists who contributed enormously to the scientific advancement of India.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO5	Demonstrate Writing and basic concepts of Grammar skills.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
Course Code	**171BS1T01- MATHEMATICS-I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Associate linear differential equations of first order to various physical problems involving differential equations of first order	3	2	-	-	-	-	-	-	-	-	-	-		-
CO2	Solve linear differential equations of higher order.	3	2	-	-	-	-	-	-	-	-	-	-		-
CO3	Solve linear systems of equations using the concept of rank, Gauss elimination, Gauss seidal method.	3	2	-	-	-	-	-	-	-	-	-	-		-
CO4	Find the eigen values and eigen vectors of matrices.	3	2	-	-	-	-	-	-	-	-	-	-	-	
CO5	Associate the concepts of Partial Differentiation to maxima and minima of functions of several variables and to Partial differential equations.	3	2	-	-	-	-	-	-	-	-	-	-	-	
Course Code	**171HS1T02 - ENVIRONMENTAL STUDIES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the need for protecting the producers and consumers in various ecosystems and their role in the food web.	-	-	-	-	-	3	2	-	-	-	-	1	-	-
CO2	Outline the natural resources and their importance for the sustenance of the life.	-	-	-	-	-	3	2	-	-	-	-	1	-	-

	CO Statements	POs												PSOs	
CO3	List out the bio diversity of India, threats and its conservation methods.	-	-	-	-	-	3	2	-	-	-	-	1	-	-
CO4	Illustrate various attributes of the pollution, impacts and measures to control the pollution along with waste management practices. Summarize the legislations of India in environmental protection.	-	-	2	-	-	3	2	-	-	-	-	1	-	-
CO5	Describe social issues both rural and urban environment to combat the challenges. Explain the population growth and its implications.	-	-	2	-	-	3	2	-	-	-	-	1	-	-
Course Code	**171BS1T05 - APPLIED CHEMISTRY**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain polymeric materials their uses and moulding techniques of plastics.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Analyse fuel characteristics using Calorific value, knocking characteristics and flue gas analysis.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Explain the working principle of Electro chemical cells and corrosion characteristics.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain the properties and applications of Nano, Superconductors, Semiconductors, Liquid crystals and fuel cells.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Summarize non-conventional energy sources and their applications	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171ES1T02 - ENGINEERING MECHANICS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Determine the resultant force and moment for a given force system.	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO2	Explain the concept of friction.	2	1	1	-	-	-	-	-	-	-	-	-	-	-
CO3	Calculate the forces in planar and spatial systems.	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO4	Locate centroid of composite areas and centre of gravity of composite bodies.	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO5	Calculate the moment of inertia of composite areas and rigid bodies.	3	2	1	-	-	-	-	-	-	-	-	-	-	-
CO6	Apply the concepts of kinematics, kinetics, work - energy and impulse - momentum methods to particle motion.	3	2	1	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171ES1T01 -COMPUTER PROGRAMMING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply Fundamental concepts of C for mathematical and scientific problems	1	2	-	-		-	-	-	-	-	-	-	2	-
CO2	Use Control Structures and Arrays in solving complex problems.	1	2	2	3		-	-	-	-	-	-	-	2	-
CO3	Develop modular programs to solve problems using control structures, Arrays and strings.	1	3	2	2		-	-	-	-	-	-	-	2	-
CO4	Demonstrate the pointers concept for allocating and deallocating memory dynamically.	1	2	2	3		-	-	-	-	-	-	-	2	-
CO5	Solve real world problems using the concept of file, structures and unions.	1	2	2	2		-	-	-	-	-	-	-	2	-

	CO Statements	POs												PSOs	
Course Code	**171HS1L01 - ENGLISH COMMUNICATION SKILLS LAB- I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of the concepts to communicate confidently and competently in English Language in all spheres.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
CO2	Express Creative skills to construct Dialogues / Conversations in Spoken and Written forms.	-	-	-	-	1	-	-	-	-	3	-	2	-	-
CO3	Identify Accent for intelligibility.	-	-	-	-	1	-	-	-	-	3	-	2	-	-
CO4	Demonstrate communicative ability in everyday Conversation, JAM Sessions and Public Speaking.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
CO5	Demonstrate nuances of Language through Audio – Visual Experience and group activities.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
Course Code	**171BS1L03- APPLIED CHEMISTRY LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate Acid – Base, Complexometric titrations by volumetric analysis.	2	-	-	-	-	-	-	-	-	-	-	-		-
CO2	Demonstrate Acid – Base titrations by instrumental analysis.	2	-	-	-	-	-	-	-	-	-	-	-		-
CO3	Estimate Vitamin C using volumetric analysis	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Prepare polymer like Bakelite.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Prepare alternative fuel like Bio-Diesel.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171ES1L01 - COMPUTER PROGRAMMING LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Implement basic programs in C.	-	2	-	-	2	-	-	-	-	-	-	-	2	-
CO2	Use Conditional and Iterative statements to solve real time scenarios in C.	-	2	2	3	2	-	-	-	-	-	-	-	2	-
CO3	Implement the concept of Arrays and Modularity.	-	3	2	2	2	-	-	-	-	-	-	-	2	-
CO4	Apply the Dynamic Memory Allocation functions using pointers.	-	2	2	3	2	-	-	-	-	-	-	-	2	-
CO5	Develop programs using structures, and Files.	-	2	2	2	2	-	-	-	-	-	-	-	2	-
II SEM															
Course Code	**171HS2T03 - ENGLISH – II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare the difference between traditional and modern technologies.	-	-	-	-	1	-	-	-	-	3	-	-	-	-
CO2	Identify the causes for climate change.	-	-	-	-	-	-	-	-	-	3	-	-	-	-
CO3	Infer professional work habits, necessary for effective collaboration and cooperation.	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO4	Develop competency in writing for political, social and religious documents.	-	-	-	-	-	-	1	-	-	3	-	-	-	-
CO5	Demonstrate writing and basic concepts of grammar skills.	-	-	-	-	-	-	-	-	-	3	-	-	-	-

	CO Statements	POs												PSOs	
Course Code	**171BS2T02- MATHEMATICS-II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply various numerical methods to find roots of equations and interpolating polynomials.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Apply numerical methods to initial value problems and problems involving integration.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Find the Fourier series of a given function and study the convergence of the series.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Find the Fourier transforms for given functions.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Apply method of separation of variables to solve one dimensional heat equation and wave equation and two dimensional laplace equations.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171BS2T06-MATHEMATICS-III**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compute Laplace transform of various functions.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Apply Laplace transform to solve initial value problems.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Discuss about beta and gamma function, double integral over a region and triple integral over a volume.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Find the gradient of a scalar function, divergence and curl of a vector function.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Apply line, surface and volume integrals to find work done by a force, flux.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171BS2T04 -APPLIED PHYSICS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of the basic concepts of interference and relate to the principle of interferometer.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**		**-**
CO2	Relate the basic concepts of diffraction to illustrate the principle of optical instruments like Telescope & microscope.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Explain the basic concepts of polarization, principle of polarimeter and the method of producing high intensity light beams.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Interpret the wave nature of microscopic particles by using quantum mechanics and explain the electrical conductivity of materials.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Explain the behaviour of materials and be able to classify them using the band theory of solids and the basic concepts of semiconductors.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171ES2T03 -ENGINEERING DRAWING**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Sketch the polygons, conics and scales by using the principles of drawing.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Draw Orthographic projections of points and lines.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Draw Orthographic projections of planes in various positions.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
CO4	Draw Orthographic projections of solids in various positions.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Construct isometric scale and isometric projections.	**3**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO6	Convert isometric view in to orthographic views.	**3**	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EE2T01- ELECTRICAL CIRCUIT ANALYSIS-I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare various electrical networks.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Summarize the behaviour of RLC networks for sinusoidal excitations.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyzes the performance of R-L, R-C and R-L-C circuits with variation of one of the parameters and concept of resonance.	**2**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	
CO4	Solve Electrical networks with network topology concepts.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	
CO5	Illustrate various electrical networks by using principles of network theorems.	**2**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	
CO6	Develop magnetic circuits with various dot conventions.	**2**	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	
Course Code	**171HS2L02 - ENGLISH COMMUNICATION SKILLS LAB- II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make effective use of Body language in all situations and contexts to enhance effective communication in all aspects.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**	**-**
CO2	Identify communicative competency to respond to others in different situations.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**	**-**
CO3	Make use of effective delivery strategies to select, compile and synthesize information for oral presentation.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**		**2**	**-**	**-**
CO4	Demonstrate in mock interviews, group discussion and public speaking.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**	**-**
CO5	Illustrate interpersonal skills using English language confidently and effectively for personal and professional growth.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**2**	**-**	**-**
Course Code	**171BS2L04 - APPLIED PHYSICS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Use spectrometer, polarimeter, travelling microscope for making measurements.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
CO2	Determine energy gap of a semiconductor, draw characteristic curves to estimate thermal coefficient of a thermsitor, zener diode.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
CO3	Determine the rigidity and determine frequency of an unknown electric vibrator.	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
CO4	Determine wavelength of unknown source, the width of narrow slits, spacing Between close rulings using lasers and appreciate the accuracy in measurements.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**
CO5	Verify magnetic field along the axis of a circular coil.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**1**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**171ES2L02 - ENGINEERING WORKSHOP AND IT WORKSHOP(ENGINEERING WORKSHOP)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Prepare carpentry, fitting joints as per the given requirement using Carpentry and Fitting tools	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**
CO2	Convert the metal rods and sheets into final shape using black smithy and tin smithy tools	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**
CO3	Prepare the circuit for house wiring applications	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**
CO4	Install the operating system software , networking and troubleshoot the problems	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**
CO5	Develop documents using MS-Office and LaTeX tools	**2**	**1**		**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**1**	**-**	**-**
III SEM															
Course Code	**171EE3T02-ELECTRICAL CIRCUIT ANALYSIS - II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the importance of three phase circuits with Star& Delta connected balanced and unbalanced loads.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Analyze the transient behaviour of electrical networks for DC excitations.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyze the transient behaviour of electrical networks for AC excitations.	**2**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Analyse the various networks parameters for the given two port networks.	**2**	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Apply the electrical networks into different forms.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE3T03-ELECTRICAL MACHINES – I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the concepts of electromechanical energy conversion.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Evaluate the ill-effects of armature reaction in dc machines.	**3**	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Determine the torque production mechanism and control the speed of dc motors.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Analyze the performance of single phase transformers by regulation, losses and efficiency	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Inspect the parallel transformers, control voltages with tap changing methods and achieve three-phase to two-phase transformer	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE3T04-BASIC ELECTRONICS DEVICES AND CIRCUITS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the fundamental principle of quantum mechanics and Solid State Physics to understand the parameters of semiconductor materials.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Classify the operation and principle characteristics of different types of diodes.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyze rectifiers, filters and regulators using p-n junction diode.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Identify various transistor configurations, different biasing, and stabilization techniques in transistor circuits.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO5	Explain the concept and operation of Feedback Amplifiers, Power Amplifier Circuits.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Determine the frequency of oscillations of different types of oscillators	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE3T05-ELECTROMAGNETIC FIELDS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the laws of Electrostatics to calculate force, electric field intensity.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Analyze the behavior of materials in electric field , calculation and design of capacitance and energy stored in the dielectrics.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Apply the laws of Magneto-statics to calculate field intensity.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Determine the magnetic forces, Self and Mutual inductances and energy stored in the magnetic field	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Analyze the concepts of Faraday's laws, displacement current and poynting vector.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171ES3T10-THERMAL AND HYDRO PRIME MOVERS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the working principles and basic functioning of I.C. engines and their performances.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO2	Evaluate the functioning and performance of thermal power plant.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO3	Distinguish the advantage of Gas turbines over various other prime movers.	**1**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO4	Discuss the working principles of different types of hydraulic turbines.	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO5	Illustrate the working principle of centrifugal and reciprocating pumps	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
Course Code	**171HS3T04-MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the Managerial Economic concepts for decision making and forward planning.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**
CO2	Illustrate the law of demand and its exceptions, to use different forecasting methods for predicting demand for various products and services.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**
CO3	Identify the cost behavior, costs useful for managerial decision-making and Break Even Point (BEP) of an enterprise.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
CO4	Outline the different types of business organizations along with basic knowledge on business cycle.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**	**-**
CO5	Make use of the process & principles of accounting and prepare Journal, Ledger, Trial Balance, Trading A/c., Profit & Loss A/c. and Balance Sheet of an enterprise.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**	**-**	**-**	**-**
CO6	Utilize various techniques on investment project proposals with the help of capital budgeting techniques for decision-making.	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
Course Code	**171ES3L04-THERMAL AND HYDRO PRIME MOVERS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Conduct performance test on Petrol and Diesel engines and interpret their performance.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Estimate energy distribution by conducting heat balance test on IC engines	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Estimate engine friction by conducting Morse test on 4-stroke multi cylinder petrol engine.	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Calculate the impact of jet on vanes	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Conduct performance test on Reciprocating pump and Centrifugal pump	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO6	Conduct performance test on Impulse and Reaction turbines	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EE3L01 ELECTRICAL CIRCUITS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze complex DC and AC linear circuits	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Apply concepts of electrical circuits across engineering.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Evaluate response in a given network by using theorems.	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Determine self and mutual inductance of a magnetic circuit.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Determine the Active and Reactive power three phase system.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171HS3A09-PROFESSIONAL ETHICS AND HUMAN VALUES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Make use of values, morals and ethics in their day to day life.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Identify what is right and wrong through moral ethics.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Analyze experimental learning while developing the society with ethos	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Apply ethical principles to resolve the problems that arise in work place.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Apply adequate knowledge on global code of conduct.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171HS3A10-EMPLOYABILITY SKILLS - I**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the number and letter series and analogies in different models.	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO2	Demonstrate processes of coding & decoding and direction test.	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**1**	**-**
CO3	Demonstrate the basic grammatical skills using articles and prepositions.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO4	Use tenses, voice types and conversion rules to deliver an effective speech.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
CO5	Demonstrate creative speaking abilities using all forms of sentences	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**-**	**-**
IV SEM															
Course Code	**171EE4T06-ELECTRICAL MEASUREMENTS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Select the instrument for measurement of voltage and current for ac and dc.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
CO2	Develop the suitable bridge for the measurement of electrical parameters.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Explain the ballistic galvanometer and flux meter for magnetic measuring instruments.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Demonstrate the calibration of the potentiometer.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Explain frequency and phase difference between signals using CRO.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE4T07-ELECTRICAL MACHINES - II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the constuction, operation and performance of three phase induction motor.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Analyze the starting and testing methods of induction motor.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Explain the construction and operation of synchronous genrerator.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Analyze the parallel operation of synchronous generators.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Determine the operationand performance of synchronous motor.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171ES4T24-DIGITAL CIRCUITS AND LOGIC DESIGN**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Interpret numeric information in different representations.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
CO2	Deminish the switching functions using Boolean algebra and minimization techniques.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Design various combinational logic circuits for required specifications.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Recognize programble logic devices.	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Design Sequencial circuits.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE4T08-CONTROL SYSTEMS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the mathematical modeling of physical systems.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Determine time response specifications of second order systems.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Apply the Routh's stability criterion and the root locus method for stability of LTI systems.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Analyze the stability of LTI systems using frequency response	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Analyze the state space representations of LTI systems.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE4T09-POWER SYSTEMS-I**	**PO1**	**PO2**	**PO3**	**PO4**	**-**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify the different components of thermal power plants.	**1**	**-**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO2	Identify the different components of nuclear Power plants.	**1**	**-**	**2**	**-**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Distinguish between AC/ DC distribution systems and also estimate voltage drops of distribution systems.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO4	Classify the different components of air and gas insulated substations.	**-**	**-**	**-**	**1**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Categorize single core and multi core cables with different insulating materials.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO6	Analyze the different economic factors of power generation and tariffs.	**2**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
Course Code	**171HS4T05-MANAGEMENT SCIENCE**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply management and motivation theories to renovate the practice of management.	-	-	-	-	-	-	-	-	-	2	-	1	-	-
CO2	Use principles of Statistical Quality Control and Materials management in the design of products and process controls.	1	1	-	-	-	-	-	-	-	3	-	1	-	-
CO3	Appraise the functional management challenges associated with high levels of change in the organizations.	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO4	Identify activities with their interdependency and use scheduling techniques of project management PERT/CPM.	1	1	-	-	-	-	-	-	-	1	1	1	-	-
CO5	Develop global vision and management skills at both strategic level and Interpersonal level	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Course Code	**171EE4L02-ELECTRONIC DEVICES AND CIRCUITS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the working of semiconductor devices and measuring instruments.	1	2	3	1	-	-	-	-	-	-	-	-	2	-
CO2	Develop the circuits with basic semiconductor devices.	1	2	3	1	-	-	-	-	-	-	-	-	2	-
CO3	Explain the characteristics of BJT & JFET.	1	1	3	1	-	-	-	-	-	-	-	-	2	-
CO4	Design different amplifiers and observe their frequency responses.	2	1	-	3	-	-	-	-	-	-	-	-	2	-
CO5	Determine the ripple factor and percentage regulation of half wave and full wave rectifier.	2	1	-	3	-	-	-	-	-	-	-	-	2	-
Course Code	**171EE4L03-ELECTRICAL MACHINES –I LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Interpret the constructional details of the DC machines and Transformers.	1	1	-	3	-	-	-	-	-	-	-	-	2	-
CO2	Determine and predetermine the performance of DC machines.	1	1	3	-	-	-	-	-	-	-	-	-	2	-
CO3	Analyze the various speed control techniques of DC motor	2	1	3	1	-	-	-	-	-	-	-	-	2	-
CO4	Estimate the performance of transformers.	2	3	1	1	-	-	-	-	-	-	-	-	2	-
CO5	Determine the efficiency and regulation of transformers	2	1	1	3	-	-	-	-	-	-	-	-	2	-
Course Code	**171HS4A11-Employability Skills –II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Examine the symbols, notations and venn diagrams	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	Use verbal adjectives, degree of comparisons in personality development	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO3	Solve problems of time & date and puzzles	1	-	-	-	-	-	-	-	-	-	-	1	-	-
CO4	Solve problems of cubes & dice and seating arrangements	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO5	Use word analogy & paragraph writing for effective communication	-	-	-	-	-	-	-	-	-	1	-	1	-	-
V SEM															
Course Code	**171EE5T10-POWER SYSTEMS-II**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate parameters of various types of transmission lines during differentoperating conditions.	2	3	2	-	-	-	-	-	-	-	-	-	1	-
CO2	Analyze the performance of short and medium transmission lines.	2	2	3	-	-	-	-	-	-	-	-	-	1	-

	CO Statements	POs												PSOs	
CO3	Demonstrate travelling waves on transmission lines.	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Identify various factors related to charged transmission lines.	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Make use of sag/tension of transmission lines and performance of line insulators	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE5T11-POWER ELECTRONICS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the different types of power semiconductor devices and their Characteristics.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Distinguish between 1ϕ and 3ϕ phase controlled converters.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyze the operation of AC voltage controllers and cycloconverters.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Analyze the operation of different types of DC-DC converters.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Illustrate the operation of Inverters and application of PWM techniques.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE5T12-PULSE AND DIGITAL CIRCUITS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Construct linear wave shaping circuits.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Demonstrate the switching characteristics of diodes and transistors and analyze the waveforms of clipper & clamper circuits.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Compare DL, TL, DTL, TTL, ECL and CMOS logic families.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Develop multi vibrators using transistors.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Examine voltage time base generators using constant current sources and apply the concept of sampling gates in digital circuits	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE5T13-SIGNALS AND SYSTEMS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Classify the signals into different categories.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Demonstrate the spectral characteristics of signals using Fourier analysis.	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Apply convolution and correlation for signal generation and signal extraction.	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Identify system characteristics in time domain and frequency domain.	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Analyze sampling process and reconstruction of signals.	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Apply Laplace and Z- transform techniques for the analysis of continuous-time and discrete-time signals and Systems.	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE5E01-RENEWABLE ENERGY SOURCES (Professional Elective - I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze solar radiation data, extraterrestrial radiation, and radiation onearth's surface.	**1**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO2	Examine the solar photo voltaic systems.	**2**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO3	Develop maximum power point techniques in solar PV and wind energy systems.	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**

	CO Statements	POs												PSOs	
CO4	Illustrate the wind energy conversion systems, wind generators and power generation.	**2**	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO5	Explain basic principle and working of tidal, biomass, fuel cell and geothermal system.	**1**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**
Course Code	**171EE5E02-MODELLING AND ANALYSIS OF ELECTRICAL MACHINES (Professional Elective - I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze the behavior of DC motor models for different applications.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Evaluate the characteristics of different types of DC motors for designing suitable controllers	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Make use of the reference frame theory of AC machines to model the induction and Synchronous machines.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Evaluate the steady state and transient behavior of induction machines to propose the suitability of drives for different industrial applications.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Evaluate the steady state and transient behavior of synchronous machines.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE5E03-ELECTRICAL SAFETY (Professional Elective - I)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe electrical hazards and safety equipment	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**
CO2	Analyze and apply various grounding and bonding techniques	**1**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**
CO3	Select appropriate safety method for low, medium and high voltage equipment	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**
CO4	Discuss safety management and organizing structure.	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**
CO5	Carry out proper maintenance of electrical equipment by understanding various Standards	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**
Course Code	**171HS5T08-INTELLECTUAL PROPERTY RIGHTS AND PATENTS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Compare various Intellectual Property rights.	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Discuss on Intellectual Property and infer rights on such Intellectual Property owners.	**1**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Explain the process of patenting	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Apply for trade mark, copyrights, patents.	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Interpret the legal issues on Intellectual Property Rights and cyber laws	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171HS5T06-EMPLOYABILITY SKILLS-III**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Calculate the L.C.M and H.C.F of numbers by simple methods.	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO2	Solve problems on Numbers & Simple equations	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO3	Apply different types of models on ratio & proportion, average, ages and percentages	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**

	CO Statements	POs												PSOs	
CO4	Apply interviewing skills, Group discussion skills and personal priorities.	-	-	-	-	-	-	-	-	-	1	-	1	-	-
CO5	Apply resume writing skills, e-mail writing & business etiquette.	-	-	-	-	-	-	-	-	-	1	-	1	-	-
Course Code	**171EE5L04-ELECTRICAL MEASUREMENTS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Measure the active and reactive power of different loads.	3	2	-	-	-	-	-	-	1	-	-	-	2	-
CO2	Calibrate ammeter, voltmeter, and wattmeter and energy meter	3	-	2	-	-	-	-	-	1	-	-	-	2	-
CO3	Illustrate the working of different bridges.	3	2	-	-	-	-	-	-	1	-	-	-	2	-
CO4	Compare the different errors of the equipment.	2	-	3	-	-	-	-	-	1	-	-	-	1	-
CO5	Determine the breakdown strength of oil used in transformers	-	2	3	-	-	-	-	-	1	-	-	-	2	-
Course Code	**171EE5L05-ELECTRICAL MACHINES-II LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Assess the performance of three phase and single phase induction motors	3	2	-	-	-	-	-	-	2	1	-	-	1	-
CO2	Examine the speed of three phase induction motor.	3	2	-	-	-	-	-	-	2	1	-	-	2	-
CO3	Pre determine the regulation of three phase alternator by various methods	3	2	-	-	-	-	-	-	2	1	-	-	2	-
CO4	Find Xd/Xq ratio of alternator and assess the performance of three phase synchronous motor	3	2	-	-	-	-	-	-	2	1	-	-	2	-
CO5	Discuss the procedure of synchronization to grid.	3	2	-	-	-	-	-	-	2	1	-	-	2	-
Course Code	**171EE5L06-CONTROL SYSTEMS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze the performance and working of Magnetic amplifier, D.C and A.C servo motors.	-	2	3	-	-	-	-	-	1	-	-	-	2	-
CO2	Design of different types of controllers like PI, PID and compensators like Lag, Lead and lead – lag.	-	2	3	-	-	-	-	-	1	-	-	-	2	-
CO3	Understand the Control of temperature using PID controller	-	2	3	-	-	-	-	-	1	-	-	-	2	-
CO4	Derive the transfer function of DC machine.	-	2	3	-	-	-	-	-	1	-	-	-	2	-
CO5	Analyze the fundamentals and application of PLC in electrical Domain.	2	-	3	-	-	-	-	-	1	-	-	-	2	-
VI SEM															
Course Code	**171EE6T14-POWER ELECTRONIC CONTROLLERS AND DRIVES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the fundamentals of electric drive and different electric brakingMethod.	2	1	3	1	-	-	-	-	-	-	-	-	1	-
CO2	Analyze the operation of single phase converter controlled dc motors and fourquadrant operation of dc motors using dual converters.	3	2	2	1	-	-	-	-	-	-	-	-	2	-
CO3	Explain the converter control of dc motors in various quadrants.	2	3	2	1	-	-	-	-	-	-	-	-	2	-
CO4	Explain the concepts of speed control of induction motor by using AC voltagecontrollers and voltage source inverters.	2	3	2	1	-	-	-	-	-	-	-	-	2	-

	CO Statements	POs												PSOs	
CO5	Explain the principles of static rotor resistance control, various slip power recovery schemes and various speed control mechanisms of synchronousmotors.	**2**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE6T15-POWER SYSTEM ANALYSIS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the impedance diagram for a power system network and per unit quantities.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Explain the steps to form aYbus and Zbus for a power system networks.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Apply the different load flow methods to solve the power system problems.	**2**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Evaluate the fault currents for all types faults to provide data for the design of Protective devices.	**1**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Evaluate the sequence components of currents for unbalanced power system Network.	**2**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Analyze the steady state, transient and dynamic stability concepts of a power system.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE6T16-MICRO PROCESSOR AND MICRO CONTROLLERS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze the generalized concepts of microprocessors.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Demonstrate programming proficiency using the various addressing modes and instructions.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Explain the basic concepts of interfacing memory and peripheral devices to amicroprocessor.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Develop the internal architecture of microcontroller systems, includingcounters, timers, ports, and memory.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Explain the circuits for various applications using microcontrollers.	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**-**
Course Code	**171EE6T17-DATA STRUCTURES**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate time and space complexities of an algorithm.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Develop recursive and non-recursive approaches to design an algorithm.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Apply various searching and sorting techniques to solve computing problems.	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Make use of linear data structures to solve real time problems.	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Outline a tree and its operations.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Demonstrate various graph traversing techniques and spanning trees	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
Course Code	**171EE6E04-COMPUTER ARCHITECHTURE (Professional Elective - II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the structure and various types of Instructions in the computer system,	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO2	Demonstrate the working of central processing unit and RISC and CISC Architecture	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO3	Summarize the Computer Arithmetic.	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO4	Demonstrate the use of pipeline and vector processing	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO5	Exemplify in a better way the I/O and memory organization	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
Course Code	**171EE6E05-ELECTRICAL DISTRIBUTION SYSTEMS (Professional Elective - II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Identify various factors of distribution system.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Design the substation and feeders.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Determine the voltage drop and power loss.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Explain the different protection and its coordination .	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Explain the effect of compensation for p.f improvement.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Explain the different methods of voltage control.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE6E06-DISTRIBUTED GENERATION & MICROGRID (Professional Elective - II)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the conventional power generation	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Analyze the concept of distributed generation and installation.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Design the grid integration system with conventional and non-conventional energy sources.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Design the dc and ac micro grid.	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Analyze power quality issues and control operation of micro grid.	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE6E07-ADVANCED CONTROL SYSTEMS (Professional Elective - III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the state space representation of control system and formulation of different state models are reviewed.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Design of control system using the pole placement technique is given after introducing the concept of controllability and observability.	**2**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Analyse of nonlinear system using the describing function technique and phase plane analysis.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Analyse the stability analysis using lypnov method.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Explain minimum principle and control variable in equality constraints.	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Formulate and solve the LQR problem and riccatti equation.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE6E08-PROGAMMABLE LOGIC CONTROLLERS & APPLICATIONS (Professional Elective - III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Interpret the PLCs and their I/O modules.	**1**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**

	CO Statements	POs												PSOs	
CO2	Develop control algorithms to PLC using ladder logic.	**1**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO3	interpret PLC Timers and counters	**1**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO4	Explain the data handling functions of PLC	**2**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO5	Analyze the applications of PLC	**1**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
Course Code	**171EE6E09-INSTRUMENTATION (Professional Elective - III)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Represent various types of signals.	**3**	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Explain the various types of Transducers primciples.	**2**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Monitor and measure various parameters such as strain, velocity, temperature, pressure etc.	**2**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Explain the working principle of various types of digital Voltmeters.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Analyze the different signals using various types of signal analyzers.	**1**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE6E10-OOPS THROUGH JAVA (Professional Elective - III**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the basic concepts and building blocks of java.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Solve complex problems using the concepts of class, inheritance, interface and packages	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Test for runtime exceptions arise in java applications	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Develop real time applications using multithreading and I/O streams.	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Apply java applets to standalone applications.	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Develop GUI applications using event handlers, adapter classes, AWT.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171HS6T07-EMPLOYABILITY SKILLS-IV**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Solve problems on Profit & Loss, Simple Interest & Compound Interest, Time & Work	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO2	Solve problems on Pipes & Cisterns, Time & Distance, Boats & Streams	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO3	Interpret the data collected for effective presentation	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**-**
CO4	Apply processes of Group discussion, Phonetics, Leadership skills in real world	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**1**	**-**	**-**
CO5	Apply principles of Group Dynamics, Interview Skills & Evaluation criteria in organizations	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**1**	**-**	**-**
Course Code	**171EE6L07-DATA STRUCTURES LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop programs using recursive functions	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Illustrate stacks and queues using arrays and linked lists	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Develop programs for searching and sorting algorithms.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Illustrate programs on concepts of trees.	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Design an algorithm for graph traversals.	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**

	CO Statements	POs												PSOs	
Course Code	**171EE6L08-POWER ELECTRONICS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the characteristics of various power electronic devices and analyze gate drive circuits of IGBT.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**1**	**-**
CO2	Analyze the performance of single–phase and three–phase full–wave bridge converters with both resistive and inductive loads.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO3	Explain the operation of single phase AC voltage regulator with resistive and inductive loads.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO4	Explain the working principle of Buck converter, Boost converter,	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO5	Explain the working principle of single–phase square wave inverter and PWM inverter.	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
VII SEM															
Course Code	**171EE7T18 UTILIZATION OF ELECTRICAL ENERGY**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Select a suitable motor for electric drives and industrial applications.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Select most appropriate heating or welding techniques for suitable applications.	**2**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Determine the illumination levels produced by different illuminating sources.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply the most efficient illuminating sources and should be able to design different lighting systems by taking inputs and constraints in view.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO5	Determine the speed-time characteristics of different types of traction motors & Estimate energy consumption levels at various modes of operation.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
Course Code	**171EE7T19 LINEAR AND DIGITAL IC APPLICATIONS**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the basic concepts of operational amplifiers.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Explain about Op-Amp parameters & Measurement.	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	List the linear and non-linear applications of op-amp.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Construct Active filters using Op-amp.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Compare different types of D-A & A-D Converters.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Illustrate the applications of different analog ICs.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE7T20 POWER SYSTEM OPERATION AND CONTROL**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain the process of optimal scheduling of Generators	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Explain the process of hydrothermal scheduling.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyze the unit commitment problem.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Illustrate importance of the frequency.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Apply concept of PID controllers in single area and two area systems.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**

	CO Statements	POs												PSOs	
CO6	Explain reactive power control and compensation for transmission line	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE7T21 SWITCH GEAR AND PROTECTION**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the Knowledge of arc interruption for application to high voltage circuit breakers of air, oil, vacuum, SF6 gas type.	**3**	**2**	**1**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Explain the working principle and operation of different types of electromagnetic protective relays	**3**	**2**	**1**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Analyse the protective schemes for high power generator and transformers	**2**	**3**	**1**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Apply the various types of protective schemes used for feeders and bus bar protection.	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Explaindifferent types of static relays and their applications	**2**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Select the different types of over voltages and protective schemes required for insulation co–ordination..	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE7E11 OPTIMIZATION TECHNIQUES (Professional Elective - IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain of basic concept of Optimization Techniques	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO2	Solve the single variable and multi variables by classical optimization techniques	**2**	**1**	**-**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO3	Solve the linear program by simplex and duality.	**1**	**2**	**3**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO4	Solve the single variable and multivariable of constrained and unconstrained optimization problems	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
CO5	Explain the evolutionary methods and swarm intelligence systems	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**
Course Code	**171EE7E12 DIGITAL SIGNAL PROCESSING (Professional Elective - IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze Discrete Time Signals and Systems.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Determine the frequency response of different systems using DTFT.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Translate the DFT approach into algorithm approach FFT.	**1**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Design IIR & FIR filters using different techniques.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Analyze multi rate DSP systems.	**2**	**2**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE7E13 SPECIAL ELECTRICAL MACHINES (Professional Elective - IV)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe the characteristics of various magnetic materials.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Explain the performance and control of stepper motors, and their applications.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Describe theory of operation and control of switched reluctance motor.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Distinguish between brush dc motor and brush less dc motor.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Explain the theory of travelling magnetic field and application of linear motors.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**

	CO Statements	POs												PSOs	
Course Code	**171EE7E14 HIGH VOLTAGE ENGINEERING (Professional Elective - V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyse the performance of high voltages with regard to different configurations of electrode systems	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Analyze the theory of breakdown and withstand phenomena of all types of dielectric materials.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**3**	**-**
CO3	Explain the techniques of generation of AC, DC and Impulse voltages.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Apply knowledge for measurement of high voltage and high current AC, DC and Impulse.	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Recognize measure dielectric property of material used for HV equipment.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Identify the techniques of testing for various equipment's used in HV engineering.	**3**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE7E15-ELECTRIC POWER QUALITY (Professional Elective - V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Differentiate between different types of power quality problems.	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Explain the sources of voltage sag, voltage swell, interruptions, transients, long duration over voltages and harmonics in a power system.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Analyze power quality terms and power quality standards.	**1**	**2**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Explain the principle of voltage regulation and power factor improvement methods.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Demonstrate the relationship between distributed generation and power quality.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO6	Explain the power quality monitoring concepts and the usage of measuring instruments.	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE7E16 EXTRA HIGH VOLTAGE AC TRANSMISSION (Professional Elective - V)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	CAnalyze the transmission line parameters.	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Analysis the several phenomena like electrostatic field, charges, and voltage gradient and conductor configuration.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Determine the corona, RI and audible noise in EHV and UHV lines.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Analyze voltage control and compensation problems in EHV and UHV transmission systems.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Illustrate the SVC schemes and Harmonics injected into network by TCR.	**1**	**3**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE7L09 POWER SYSTEMS SIMULATION LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Determine sequence impedances of Transformer & Alternator.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**1**	**-**

	CO Statements	POs												PSOs	
CO2	Apply and measure A,B,C,D parameters of Short, Medium and Long Transmission lines.	**3**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO3	Evaluate Active and Reactive power at various buses.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO4	Explain the process to draw the locus diagrams.	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
CO5	Analyze the method to measure high currents.	**1**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE7L10- MICRO PROCESSOR AND MICRO CONTROLLERS LAB**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Apply the fundamentals of assembly level programming of microprocessors.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO2	Develop interfacing circuits with 8086.	**1**	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO3	Relate the assembly level programming of microprocessors with microcontrollers.	**1**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO4	Design interfacing circuits with 8051.	**2**	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
CO5	Develop an assembly language program for specified application with 8051.	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**2**	**-**
Course Code	**171EE7P01 - INDUSTRY ORIENTED (INTERNSHIP) MINOR PROJECT**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Conduct a technical survey to identify a real world engineering problem	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**	**1**	**1**	**-**
CO2	Analyze the industrial plant layout using technical expertise	**2**	**-**	**-**	**-**	**-**	**1**	**1**	**-**	**-**		**-**	**1**	**-**	**1**
CO3	Compare theoretical and real work environments in technical perspective	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**1**	**1**	**2**	**-**
CO4	Identify the challenges in the execution of operations	**1**	**1**	**1**	**1**		**-**	**-**	**-**	**-**		**-**	**-**	**1**	**-**
CO5	Execute the operations and report the results of assigned tasks using modern tools adhering to professional ethics	**-**	**-**	**-**	**-**	**2**	**-**	**-**	**2**	**1**	**1**	**-**	**-**	**2**	**1**
VIII SEM															
Course Code	**171EE8E17 HVDC TRANSMISSION (Professional Elective-VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain different types of HVDC levels and basic concepts	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Explain the operation of converters.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Infer the control of converter and HVDC Transmission.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Explain the control concept of reactive power control and AC/DC load flow.	**2**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Explain the converter faults, protection and harmonic effects.	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Design low pass and high pass filters.	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE8E18 Flexible AC Transmission Systems (Professional Elective-VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Analyze the performance improvement of transmission system with FACTS.	**1**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Examine the effect of static series compensation.	**2**	**1**	**3**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**

	CO Statements	POs												PSOs	
CO3	Examine the effect of UPFC.	**3**	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Determine an appropriate FACTS device for different types of applications.	**1**	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Analyze the properties of static stunt compensation.	**1**	**1**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE8E19 POWER SYSTEM REFORMS (Professional Elective-VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate importance of power system deregulation and restructuring.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Compute Available Transfer Capability.	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Analyse transmission congestion management.	**1**	**-**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Compute electricity pricing in deregulated environment.	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	Apply power system operation in deregulated environment and ancillary services.	**1**	**-**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE8E20 DIGITAL CONTROL SYSTEMS (Professional Elective-VI)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Know the advantages of discrete time control systems	**3**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO2	Learn z–transformations and their role in the mathematical analysis of different systems	**3**	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO3	Apply the discrete–time systems in state–space model	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO4	Analyze the significance stability of the system using different tests.	**3**	**1**	**1**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO5	know conventional method of analyzing digital control systems in the w–plane	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
CO6	Design the state feedback control by “the pole placement method.	**3**	**1**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**1**	**-**
Course Code	**171EE8O01 - ENERGY AUDIT, CONSERVATION AND MANAGEMENT (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Explain energy efficiency, conservation and various technologies.	**2**	**3**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Design energy efficient lighting systems.	**3**	**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Calculate power factor of systems and propose suitable compensation techniques.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Explain energy conservation in HVAC systems.	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Calculate life cycle costing analysis and return on investment on energy efficient technologies.	**1**	**2**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EE8O02 -VLSI DESIGN (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Summarize the fundamental concepts of VLSI Design including both fabrication process and basic design elements.	**2**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Analyse the electrical properties of MOS and BiCMOS Circuits	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Develop the stick and layout models of MOS circuits using design rules.			**1**	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Demonstrate the scaling factors determining the characteristics and performance of MOS circuits in silicon	**2**	**2**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
CO5	Explain synthesis, simulation of VLSI design using VHDL	**2**	**-**	**1**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EE8O03 -UNIX AND SHELL PROGRAMMING (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Describe UNIX operating System and Command Structure.	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Make use of various commands in UNIX to control the resources like disk, file, network etc.	**2**	**2**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Develop Shell Script using Shell commands.	**2**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Apply GREP and EGREP Commands with wild card and regular expressions to perform Data Manipulation Tasks.	**2**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Utilize filter commands to work on Files and documents.	**2**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO6	Explain about shell programming.	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EE8O04 NEURAL NETWORKS AND FUZZY LOGIC (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate different models of artificial neuron.	**2**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Identify various learning methods of ANN.	**2**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Analyze the various feed forward neural networks and Hopfield Network	**2**	**2**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Compare and Contrast Classical and Fuzzy sets.	**2**	**1**	**-**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Utilize different modules of Fuzzy Logic Controller for rule base and decision making Systems	**2**	**2**	**1**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO6	Analyze the application of fuzzy logic control to real time systems	**2**	**2**	**2**	**-**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EE8O05 ROBOTICS (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the basic concepts, parts of robots and types of robots.	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Identify various robot configuration and components.	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Select appropriate actuators and sensors for a robot based on specific application.	**3**	**-**	**1**	**1**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Analyze the simple serial kinematic chains.	**3**	**3**	**-**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO5	Analyze the trajectory planning for a manipulator by avoiding obstacles.	**3**	**3**	**2**	**2**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
Course Code	**171EE8O06 VEHICULAR ELECTRIC POWER SYSTEMS (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Understand the various aspects of hybrid and electric vehicles.	**1**	**2**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO2	Plan the selection of electrical machines for hybrid and electric vehicles.	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO3	Select various energy storage technologies for hybrid and electric vehicles.	**1**	**1**	**3**	**1**	**1**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
CO4	Implement energy management techniques for hybrid and electric vehicles.	**2**	**1**	**-**	**3**	**2**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

	CO Statements	POs												PSOs	
CO5	Demonstrate the power system of various vehicular system.	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171EE8O07 INTERNET OF THINGS (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Demonstrate the need of IoT in the computing world.	**2**	**1**	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Identify the Business Process models of IoT.	**1**	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Develop the communication protocols and communication technologies.	**2**	-	**1**	-	-	-	-	-	-	-	-	-	-	-
CO4	Analyze the data storage and acquisition mechanisms for real time applications.	**2**	-	-	-	**2**	-	-	-	-	-	-	-	-	-
CO5	Describe the involvement of cloud service model platforms in IoT.	**1**	-	-	-	-	-	-	-	-	-	-	-	-	-
CO6	Design an IoT application for complex problems.	**2**	**2**	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	**171EE8O08- CYBER SECURITY (Open Elective)**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Illustrate cybercrime fundamentals.	**2**	**1**	-	-	**2**	-	-	**2**	-	-	-	-	-	-
CO2	Analyze cyber offence planning.	**2**	**2**	-	**2**	**2**	-	-	-	-	-	-	-	-	-
CO3	Interpret cybercrime on mobile and wireless devices.	**1**	**2**	-	**2**	**2**	-	-	-	-	-	-	-	-	-
CO4	Distinguish type of tools and methods used in cyber crimes.	**1**	**2**	-	**2**	**2**	-	-	-	-	-	-	-	-	-
CO5	Explain the importance of cyber security.	**2**	**1**	-	-	**2**	-	-	**2**	-	-	-	-	-	-
Course Code	**171EE8P02- MAJOR PROJECT**	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**	**PSO1**	**PSO2**
CO1	Develop technical procedure of planning and scheduling of an identified project work through technical survey in line with societal and environmental implications.	**1**	-	-	-	-	**2**	**2**	-	-	-	**1**	-	**1**	**1**
CO2	Demonstrate technical skills of data collection and data analysis adhering to professional ethics	**1**	-	-	-	-	-	-	**2**	-	-	**1**	**1**	**1**	**1**
CO3	Design the solutions for the critical problem areas marked in data analysis	**2**	**2**	**3**	**2**	-	-	-	-	-	-	-	-	**1**	**1**
CO4	Build a team of people to work together and communicate well in the critical stages of project progress.	-	-	-	-	-	-	-	-	**1**	**2**	**1**	**1**	**1**	**1**
CO5	Use modern tools to derive conclusions and communicating the results of the project work effectively	-	-	-	-	**3**	-	-	-	-	**2**	**1**	**1**	**1**	**1**