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Department of Electronics and Communication 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).

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	CO Statements	POs												PSOs	
Course Code	171BS1T02 - 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	171BS1T04 - 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	-	-	-	-	-	-	-	-	-	-	1	-
CO3	Explain the basic concepts of polarization, principle of polarimeter and the method of producing high intensity light beams.	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO4	Interpret the wave nature of microscopic particles by using quantum mechanics and explain the electrical conductivity of materials.	2	1	-	-	-	-	-	-	-	-	-	-	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	-	-	-	-	-	-	-	-	-	-	1	-
Course Code	171ES1T03 - 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.	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO2	Draw Orthographic projections of points and lines.	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO3	Draw Orthographic projections of planes in various positions.	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO4	Draw Orthographic projections of solids in various positions.	1	1	1	-	-	-	-	-	-	-	-	-	-	-
CO5	Construct isometric scale and isometric projections.	1	1	1	-	1	-	-	-	-	1	-	-	-	-

	CO Statements	POs												PSOs	
CO6	Convert isometric view in to orthographic views.	1	1	1	-	1	-	-	-	-	1	-	-		
Course Code	17IES1T01 -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	-	-	-	-	-	-	-	-	-	-	-	-
CO2	Use Control Structures and Arrays in solving complex problems.	1	2	2	3	-	-	-	-	-	-	-	-	-	-
CO3	Develop modular programs to solve problems using control structures, Arrays and strings.	1	3	2	2	-	-	-	-	-	-	-	-	-	-
CO4	Demonstrate the pointers concept for allocating and deallocating memory dynamically.	1	2	2	3	-	-	-	-	-	-	-	-	-	-
CO5	Solve real world problems using the concept of file, structures and unions.	1	2	2	2	-	-	-	-	-	-	-	-	-	-
Course Code	17IHS1L01 - ENGLISH COMMUNICATION SKILLS LAB- I	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Enable students to learn Basic /Simple English in different contexts and situations.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
CO2	Enhance the knowledge of Phonetic sounds and symbols to improve accent and pronunciation	-	-	-	-	1	-	-	-	-	3	-	2	-	-
CO3	Evolve creative skills in the students to construct dialogues/conversations in spoken and written forms.	-	-	-	-	1	-	-	-	-	3	-	2	-	-
CO4	improve effective use of aspects of pronunciation like stress, pitch, intonation, rhythm, etc	-	-	-	-	1	-	-	-	-	3	-	1	-	-
CO5	inculcate in the students the significance of English in all walks of life and make them well-versed in LSRW skills.	-	-	-	-	1	-	-	-	-	3	-	1	-	-
Course Code	17IBS1L04- 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	-	-	-	-	-	-	2	-	-	1	-	-
CO2	Determine energy gap of a semiconductor, draw characteristic curves to estimate thermal coefficient of a thermistor, zener diode.	2	2	-	-	-	-	-	-	2	-	-	1	-	-
CO3	Determine the rigidity and determine frequency of an unknown electric vibrator.	3	1	-	-	-	-	-	-	2	-	-	1	-	-

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	CO Statements	POs												PSOs	
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	171HS2T02- 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.	-	-	-	-	-	1	3	-	-	-	-	-	-	-
CO2	Outline the natural resources and their importance for the sustenance of the life.	-	-	-	-	-	2	3	-	-	-	-	-	-	-
CO3	List out the biodiversity of India, threats and its conservation methods	-	-	-	-	-	1	3	-	-	-	-	-	-	-
CO4	Explain the different types of pollutions and their control technologies, Waste water treatment, Bio medical waste management etc.	-	-	2	1	-	2	3	-	-	-	-	-	-	-
CO5	Explain EIA- Environmental Impact Assessment, Sustainable developmental activities, environmental policies and regulations.	-	-	2	-	-	2	3	-	-	3	-	-	-	-
Course Code	171BS2T05 -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	Classify solid, liquid and gaseous fuels.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Explain about batteries, corrosion and their control methods.	3	-	-	-	-	-	-	-	-	-	-	-	-	-
CO4	Explain Nano materials, Super Conductors, Semi Conductors and Liquid Crystals.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Summarize non-conventional energy sources and their applications.	2	-	-	-	-	-	-	-	-	-	-	-	-	-
Course Code	171ES2T06 - ELECTRICAL & MECHANICAL TECHNOLOGY	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the operation of DC generators, 3-point starter, DC Motor, and single-phase transformer.	2	-	1	-	-	-	3	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
CO2	Compare the operation of 3-phase alternator and 3-phase induction motors.	2	-	1	-	-	-	3	-	-	-	-	-	-	-
CO3	Classify the operation of MI, MC, wattmeter, energy meter and CRO instruments.	2	-	1	-	-	-	3	-	-	-	2	-	-	-
CO4	Illustrate the principles of various energy resources, working of Internal Combustion Engines and modes of heat transfer.	2	1	1	-	-	-	-	-	-	-	-	-	-	-
CO5	Compare the different types of power transmission elements and different manufacturing methods.	2	1	1	-	-	-	-	-	-	-	-	-	-	-
Course Code	171CS2T01- DATA STRUCTURES THROUGH C	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Describe the the fundamental concepts of data structure and algorithms.	2	3	1	-	-	-	-	-	-	-	-	-	2	
CO2	Analyze the time and space complexity of an algorithm using various notations.	2	3	1		-	-	-	-	-	-	-	-	2	
CO3	Apply various searching and sorting techniques to solve computing problems.	2	2	3		-	-	-	-	-	-	-	-	2	
CO4	Explain various operations and applications of Linear Data Structure.	2	2	3	2	-	-	-	-	-	-	-	-	2	
CO5	Apply various tree , graph traversing techniques and spanning trees in solving complex problem.	2	2	3	2	-	-	-	-	-	-	-	-	2	
Course Code	171HS2L02 - ENGLISH COMMUNICATION SKILLS LAB- II	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Illustrate interpersonal skills using language confidently and effectively for personal and profession growth.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO2	Enable students to learn Basic /Simple English in different contexts and situations.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO3	Enhance the knowledge of Phonetic sounds and symbols to improve accent and pronunciation.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
CO4	Evolve creative skills in the students to construct dialogues/conversations in spoken and written forms.	-	-	-	-	-	-	-	-	-	3		2		
CO5	inculcate in the students the significance of English in all walks of life and make them well-versed in LSRW skills.	-	-	-	-	-	-	-	-	-	3	-	2	-	-
Course Code	171BS2L03 - APPLIED CHEMISTRY LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Analyze & generate experimental skills	2	-	-	-		-	-	-	1	1	-	1	-	-

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	CO Statements	POs												PSOs	
Course Code	171EC3T04-RANDOM VARIABLES AND STOCHASTIC PROCESSES	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Apply a suitable random variable to a practical problem or an environment from a standard set of random variables.	3	2	-	-	-	-	-	-	-	-	-	-	3	-
CO2	Compare various random variables with statistical averages such as mean, standard deviation, variance and moments.	3	2	1	-	-	-	-	-	-	-	-	-	3	-
CO3	Construct a multiple random variable from a single random variable.	3	2	1	-	-	-	-	-	-	-	-	-	2	-
CO4	Classify the category of a given random processes.	2	2	-	-	-	-	-	-	-	-	-	-	2	-
CO5	Apply the concept of random variable and random processes to a Linear Time Invariant System.	2	2	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	-	-	-	-	1
CO2	Illustrate the law of demand and its exceptions, to use different forecasting methods for predicting demand for various products and services.	-	-	-	-	-	-	-	-	-	2	-	-	-	1
CO3	Identify the cost behavior, costs useful for managerial decision making and Break Even Point (BEP) of an enterprise.	-	-	-	-	-	-	-	-	-	-	3	-	-	1
CO4	Outline the different types of business organizations along with basic knowledge on business cycle.	-	-	-	-	-	-	-	-	-	-	1	-	-	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.	-	-	-	-	-	-	-	-	-	3	-	-	-	1
CO6	Utilize various techniques on investment project proposals with the help of capital budgeting techniques for decision making.	-	-	-	-	-	-	-	-	-	-	2	-	-	2
Course Code	171EC3L01-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.	2	1	-	-	-	-	-	-	2	1	-	-	2	-
CO2	Develop the circuits with basic semiconductor devices.	3	2	-	-	-	-	-	-	2	1	-	-	3	-
CO3	Explain the characteristics of BJT & JFET.	2	2	-	-	-	-	-	-	2	1	-	-	3	-
CO4	Design different amplifiers and observe their frequency responses.	2	2	-	-	-	-	-	-	2	1	-	-	3	-

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	CO Statements	POs												PSOs	
CO2	Compare the linear modulation and demodulation techniques based on bandwidth and power.	3	2	-	-	-	-	-	-	-	-	-	-	3	-
CO3	Develop the appropriate circuit with the given specifications for generation and detection of angle modulated signals.	2	2	1	1	-	-	-	-	-	-	-	-	3	-
CO4	Build the AM/FM transmitters and receivers from the given specifications.	2	2	1	-	-	-	-	-	-	-	-	-	3	-
CO5	Illustrate noise performance in linear and angle modulation techniques.	2	2	2	-	-	-	-	-	-	-	-	-	2	-
CO6	Select the appropriate circuit with the given specifications for generation and detection of pulse analog modulated signals.	2	2	2	1	-	-	-	-	-	-	-	-	3	-
Course Code	171EC4T08-PULSE & 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	-	-	-	-	-	-	-	-	2	-
CO2	Demonstrate the switching characteristics of diode and transistor and analyze the waveforms of clipper & clamper circuits.	2	1	1	-	-	-	-	-	-	-	-	-	3	-
CO3	Compare DL, TL, DTL,TTL, ECL and CMOS logic families.	2	2	2	1	-	-	-	-	-	-	-	-	3	-
CO4	Develop multivibrators using transistors.	2	2	2	1	-	-	-	-	-	-	-	-	3	-
CO5	Examine voltage time base generators using constant current sources and apply the concept of sampling gates in digital circuits.	2	2	1	1	-	-	-	-	-	-	-	-	2	-
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	3	1	-	2
CO2	Use principles of Statistical Quality Control and Materials management in the design of products and process controls.	1	-	-	-	-	-	-	-	-	3	-	1	-	2
CO3	Appraise the functional management challenges associated with high levels of change in the organizations.	-	-	-	-	-	-	-	-	-	1	-	1	-	2
CO4	Identify activities with their interdependency and use scheduling techniques of project management PERT/CPM.	1	-	-	-	-	-	-	3	-	1	1	1	-	2
CO5	Develop global vision and management skills both at strategic level and interpersonal level.	-	-	-	-	-	-	-	-	-	1	-	1	-	2

	CO Statements	POs												PSOs	
Course Code	171ES4T28-LINEAR CONTROL SYSTEMS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Develop the overall transfer function using block diagram algebra and signal flow graphs	3	1	1	-	-	-	-	-	-	-	-	-	2	-
CO2	Identify time response specifications, error constants of second order systems	2	2	1	1	-	-	-	-	-	-	-	-	2	-
CO3	Analyze absolute and relative stability of LTI systems using Routh's stability criterion and the root locus method	3	2	-	-	-	-	-	-	-	-	-	-	3	-
CO4	Analyze the stability of LTI systems using frequency response methods	2	2	2	1	-	-	-	-	-	-	-	-	3	-
CO5	Develop state models for physical systems	2	2	1	1	-	-	-	-	-	-	-	-	3	-
Course Code	171HS4T08-INTELLECTUAL PROPERTY RIGHTS AND PATENTS	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Compare various types of Intellectual Property rights.	-	-	-	-	-	-	-	3	-	-	-	2	-	-
CO2	Discuss Intellectual Property and infer rights on such Intellectual Property owners	-	-	-	-	-	-	-	3	-	-	-	2	-	-
CO3	Explain the process of patenting	-	-	-	-	-	-	-	3	-	-	-	2	-	-
CO4	Apply for trade marks and trade secrets.	-	-	-	-	-	-	-	3	-	-	-	2	-	-
CO5	Interpret the legal issues on Intellectual Property Rights and cyber laws	-	-	-	-	-	-	-	3	-	-	-	2	-	-
Course Code	171EC4L02-ELECTRONIC CIRCUIT ANALYSIS LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Determine the frequency response, impedance and Q-point of different types of multi stage amplifiers.	3	2	-	-	1	-	-	-	2	-	-	-	3	-
CO2	Construct voltage and current feedback amplifiers for given specifications.	3	2	-	-	1	-	-	-	1	-	-	-	2	-
CO3	Analyze LC and RC types of oscillators for given specifications.	3	3	-	-	2	-	-	-	2	-	-	-	3	-
CO4	Analyze the efficiency of class A power amplifier for given specifications.	2	1	-	-	-	-	-	-	2	-	-	-	2	-
CO5	Determine the frequency response of single tuned amplifier for given specifications.	2	2	-	-	1	-	-	-	1	-	-	-	2	-

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	CO Statements	POs												PSOs	
CO3	Examine time and space parameters of a switched signal.	2	2	1	-	-	-	-	-	-	-	-	1	3	-
CO4	Compare different switching techniques and networks.	2	1	1	-	-	-	-	-	-	-	-	1	2	-
CO5	Summarize ISDN standards, services, protocol architecture and interfaces.	2	1	1	-	-	-	-	-	-	-	-	1	2	-
Course Code	171HS5T06-EMPLOYABILITY SKILLS-III	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain different types of puzzles,group reasoning,clock and calender problems	1	-	-	-	-	-	-	-	-	-	-	1	-	1
CO2	Solve problems on cubes & dice, partnership, percentages.	1	-	-	-	-	-	-	-	-	-	-	1	-	1
CO3	Solve problems on profit and loss, simple interest and compound interest	1	-	-	-	-	-	-	-	-	-	-	1	-	1
CO4	Apply interviewing skills, Group discussion skills and personal priorities	-	-	-	-	-	-	-	-	-	1	-	1	-	1
CO5	Apply resume writing skills, e-mail writing & business etiquette	-	-	-	-	-	-	-	-	-	1	-	1	-	1
Course Code	171EC5L04-LINEAR IC APPLICATIONS LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Experiment with different types of – Adder, Subtractor, Comparator, Integrator and Differentiator circuits for the given specifications.	3	2	2	-	-	-	-	-	2	-	-	-	3	-
CO2	Demonstrate different types of Active filters using Op-Amps.	2	3	2	-	-	-	-	-	2	-	-	-	2	-
CO3	Elaborate the working of Function Generator using Op-Amps.	2	3	2	-	-	-	-	-	2	-	-	-	3	-
CO4	Build the circuits of IC 555 Timer, IC 565 and IC 566.	3	2	2	-	-	-	-	-	2	-	-	-	3	-
CO5	Suggest different types of regulators using Op-Amps.	2	2	3	-	-	-	-	-	2	-	-	-	2	-
CO6	Analyze D-A converter Circuits using Op-Amps.	3	2	2	-	-	-	-	-	2	-	-	-	3	-
Course Code	171EC5L05-DIGITAL IC APPLICATIONS LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Classify the different levels of abstraction in VHDL.	3	-	2	-	2	-	-	-	2	-	-	-	2	-

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	CO Statements	POs												PSOs	
Course Code	171EC6E08-BIOMEDICAL ENGINEERING (PROFESSIONAL ELECTIVE - III)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain basic characteristics of measurement systems.	-	-	3	2	-	2	-	-	-	-	-	2	2	-
CO2	Classify various types of transducers and electrodes.	-	-	3	1	-	2	-	-	-	-	-	2	3	-
CO3	Illustrate Cardiovascular and respiratory systems with its measurements.	-	-	2	2	-	3	-	-	-	-	-	2	3	-
CO4	Demonstrate the measurements of human body parameters with Intensive Care monitoring equipment.	-	-	2	-	-	3	-	-	-	-	-	2	3	-
CO5	Utilize the concept of Electro-physiology of various systems and recording of the bioelectric signals.	-	-	2	3	-	2	-	-	-	-	-	2	3	-
Course Code	171EC6E09-INFORMATION THEORY AND CODING (PROFESSIONAL ELECTIVE - III)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the basic concepts of Entropy and source coding.	3	1	-	-	-	-	-	-	-	-	-	-	2	-
CO2	Demonstrate the concepts of mutual information and channel capacity.	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO3	Develop the linear block codes for the given data	3	2	-	-	-	-	-	-	-	-	-	-	3	-
CO4	Develop the cyclic codes and BCH codes for the given data.	2	2	1	1	-	-	-	-	-	-	-	-	3	-
CO5	Construct the convolution Encoder and Decoder.	2	2	-	1	-	-	-	-	-	-	-	-	3	-
Course Code	171HS6T07-EMPLOYABILITY SKILLS-IV	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Solve problems of seating arrangements, syllogism	1	-	-	-	-	-	-	-	-	-	-	1	-	1
CO2	Solve problems of Time and Work, Pipes and Cisterns, Time and Distance, Races and trains	1	-	-	-	-	-	-	-	-	-	-	1	-	1
CO3	Solve Problems on Boats and Streams, Permutation and Combination, Probability and Data Interpretation	1	-	-	-	-	-	-	-	-	-	-	1	-	1
CO4	Apply processes of Group discussion, Phonetics, Leadership skills in real world	-	-	-	-	-	-	-	-	-	2	-	1	-	1
CO5	Apply principles of Group Dynamics, Interview Skills & Evaluation criteria in organizations	-	-	-	-	-	-	-	-	-	2	-	1	-	1

	CO Statements	POs												PSOs	
Course Code	171EC6L07-MICROPROCESSORS AND MICROCONTROLLERS 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.	3	2	-	-	2	-	-	-	2	-	-	-	3	-
CO2	Develop interfacing circuits with 8086.	3	2	-	-	2	-	-	-	2	-	-	-	3	-
CO3	Relate the assembly level programming of microprocessors with microcontrollers.	2	1	-	-	2	-	-	-	2	-	-	-	2	-
CO4	Design interfacing circuits with 8051.	2	3	-	-	2	-	-	-	2	-	-	-	2	-
CO5	Develop an assembly language program for specified application with 8051.	2	3	-	-	2	-	-	-	2	-	-	-	2	-
Course Code	171EC6L08-VLSI LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Outline different schematics for the same given logic.	3	2	-	1	2	-	-	-	-	-	-	-	3	-
CO2	Design logic schematics as per the list of specifications from user.	3	2	-	1	2	-	-	-	-	-	-	-	2	-
CO3	Infer different types of layouts with respect to stated IC Aspect Ratio.	3	2	-	1	2	-	-	-	-	-	-	-	1	-
CO4	Interpret the concepts of DRC, LVS and PEX in designing the ICs.	1	1	-	3	2	-	-	-	-	-	-	-	2	-
CO5	Distinguish the simulation results of pre and post layout simulation for a logic circuit.	1	1	-	3	2	-	-	-	-	-	-	-	1	-
Course Code	171EC6L09-DIGITAL COMMUNICATIONS LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Examine Time Division Multiplexing and Demultiplexing.	3	2	-	-	2	-	-	-	2	-	-	-	3	-
CO2	Analyze digital baseband modulation techniques.	3	1	-	-	2	-	-	-	2	-	-	-	3	-
CO3	Experiment with various digital carrier modulation schemes.	3	1	-	-	2	-	-	-	2	-	-	-	3	-
CO4	Measure the efficiency of the source coding techniques.	2	2	-	-	2	-	-	-	2	-	-	-	3	-
CO5	Examine different error control coding schemes.	2	2	-	-	2	-	-	-	2	-	-	-	3	-

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	CO Statements	POs												PSOs	
CO4	Discuss the functioning of digital signature standards and data integrity.	2	1	3	1	-	-	-	-	-	-	-	-	-	-
CO5	Utilize the services provided by thePGP,S/MIME & SSL,TLS.	1	3	1	1	-	-	-	-	-	-	-	-	-	-
CO6	Demonstrate the concept of IPSecurity.	2	3	2	1	-	-	-	-	-	-	-	-	-	-
Course Code	171EC7E15-RADAR SYSTEMS (PROFESSIONAL ELECTIVE - V)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Interpret the basic concepts of Radar systems	3	1	1	-	-	-	-	-	-	-	-	1	3	-
CO2	Make use of the range equation inanalytical problems.	3	2	2	-	-	-	-	-	-	-	-	1	3	-
CO3	Explain the different types of radars and its applications.	2	1	-	-	-	-	-	-	-	-	-	1	2	-
CO4	Classify the different tracking techniques.	2	1	1	-	-	-	-	-	-	-	-	1	1	-
CO5	Explain the performance of radar receiver systems.	2	1	1	-	-	-	-	-	-	-	-	1	1	-
Course Code	171EC7L10-MICROWAVE ENGINEERING AND OPTICAL COMMUNICATIONS LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Demonstrate Reflex klystron Characteristics.	3	1	-	-	-	-	-	-	2	1	-	-	3	-
CO2	Interpret parameters of various waveguide components.	3	1	-	-	-	-	-	-	2	1	-	-	2	-
CO3	Explain various characteristics of TEDs.	2	1	-	-	-	-	-	-	2	1	-	-	2	-
CO4	Illustrate the impact of optical devices with and without channel losses.	2	1	-	-	-	-	-	-	2	1	-	-	2	-
CO5	Demonstrate various waveguide parameters for a given Multiport network	2	1	-	-	-	-	-	-	2	1	-	-	2	-
Course Code	171EC7L11-DIGITAL SIGNAL AND IMAGE PROCESSING LAB	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Develop basic programs in Matlab	3	-	-	-	2	-	-	-	2	2	-	-	2	-
CO2	Compare the performance of various digital filters	3	-	-	-	2	-	-	-	2	2	-	-	2	-

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	CO Statements	POs												PSOs	
CO2	Find the rate of sewage flow.	1	-	-	1	2	-	-	-	-	-	-	-	-	-
CO3	Identify the various characteristics of sewage.	2	2	-	2	2	-	-	-	-	-	-	-	-	-
CO4	Outline various wastewater treatment technologies.	2	1	-	2	1	-	-	-	-	-	-	-	-	-
CO5	Explain the different treated effluent disposal methods.	2	1	-	2	2	-	-	-	-	-	-	-	-	-
CO6	Illustrate the need of wastewater recycling.	2	1	-	2	2	-	-	-	-	-	-	-	-	-
Course Code	171EE8005-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	-	-	-	-	-	-	-	-	-	2	-	-	-
CO2	Identify various robot configuration and components,	1	2	-	-	-	-	-	-	-	-	2	-	-	-
CO3	Select appropriate actuators and sensors for a robot based on specific application	2	-	-	-	1	-	-	-	-	-	-	-	-	-
CO4	Analyze the simple serial kinematic chains	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	Analyze the trajectory planning for a manipulator by avoiding obstacles.	2	2	-	-	2	-	-	-	-	-	1	-	-	-
Course Code	171EC8002-DISASTER MANAGEMENT (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the basics of disaster management and their mitigation measures.	2	-	-	-	-	-	2	-	-	-	-	-	-	-
CO2	Interpret the disaster vulnerability conditions of India.	2	-	-	-	-	-	2	-	-	-	-	-	-	-
CO3	Choose the means of preparedness measures against disaster.	2	-	-	-	-	-	2	-	-	-	-	-	-	-
CO4	Illustrate the impact of hazards on structures.	2	-	-	-	-	-	2	-	-	-	-	-	-	-
CO5	Outline the various rehabilitation programmes to be adopted.	2	-	-	-	-	-	2	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
Course Code	171EE8007-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.	1	3	-	1	-	-	-	-	-	-	-	-	-	-
CO2	Identify the Business Process models of IoT.	1	3	1	-	-	-	-	-	-	-	-	-	-	-
CO3	Develop the communication protocols and communication technologies.	2	-	3	1	2	-	-	-	-	-	-	-	-	-
CO4	Analyze the data storage and acquisition mechanisms for real time applications.	1	2	2	3	-	-	-	-	-	-	-	-	-	-
CO5	Describe the involvement of cloud service model platforms in IoT.	1	1	1	3	-	-	-	-	-	-	-	-	-	-
CO6	Design an IoT application for complex problems.	-	-	2	-	3	-	-	-	-	-	-	-	-	-
Course Code	171EC8003-NEURAL NETWORKS (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Relate the function of artificial neural networks to the functionality of human brain.	2	1	-	-	1	-	-	-	-	-	-	-	-	-
CO2	Determine the assumptions behind, and the derivations of the various learning algorithms.	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	Manage to draw solutions to the engineering problems using Back-Propagation algorithm.	2	1	2		2	-	-	-	-	-	-	-	-	-
CO4	Compare the single level perceptron and multi level perceptron algorithms by their functionality and utilization.	2	1	-		2	-	-	-	-	-	-	-	-	-
CO5	Assess the Neural Networks algorithms to achieve signal processing, optimization, classification and process modeling.	2	1	1		2	-	-	-	-	-	-	-	-	-
Course Code	171CE8003-ALTERNATIVE ENERGY SOURCES (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Explain the generation, measurement and applications of solar radiation.	1	-	-	-	-	1	1	-	-	-	-	-	-	-
CO2	Explain the Solar energy collection, storage and applications.	1	-	-	-	-	1	1	-	-	-	-	-	-	-
CO3	Discuss the working principles of Wind energy and Bio-mass energy resources.	1	-	-	-	-	1	1	-	-	-	-	-	-	-
CO4	Illustrate the techniques and conversion principles of Geothermal and tidal energy resources.	1	-	-	-	-	1	1	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
CO5	Make use of working principles in energy conversion.	1	-	-	-	-	1	1	-	-	-	-	-	-	-
Course Code	171CE8002-DATABASE MANAGEMENT SYSTEMS (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Summarize the database characteristics.	2	-	-	-	1	-	-	-	-	-	-	-	-	-
CO2	Identify various database architectures.	2	-	1	-	1	-	-	-	-	-	-	-	-	-
CO3	Interpret relational database using SQL.	1	-	1	-	2	-	-	-	-	-	-	-	-	-
CO4	Examine issues in data storage and query processing for appropriate solutions.	1	2	1	-	2	-	-	-	-	-	-	-	-	-
CO5	Make use of normalization techniques for real world database design.	2	2	1	-	3	-	-	-	-	-	-	-	-	-
CO6	Illustrate the mechanisms of transaction management.	2	2	-	-	1	-	-	-	-	-	-	-	-	-
Course Code	171EC8004-WEB TECHNOLOGIES (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Develop web pages using HTML, CSS and JavaScript.	2	1	2	-	-	-	-	-	-	-	-	-	-	-
CO2	Summarize DTD, Schema and Parsing tools of XML documents.	2	-	2	-	-	-	-	-	-	-	-	-	-	-
CO3	Build web applications using PHP and MySQL database.	3	-	3	-	2	-	-	-	-	-	-	-	-	-
CO4	Discuss the integration of PHP with AJAX.	2	-	2	-	2	-	-	-	-	-	-	-	-	-
CO5	Develop simple applications using PERL.	2	2	2	-	-	-	-	-	-	-	-	-	-	-
CO6	Apply basic features of Ruby in various applications.	2	2	2	-	-	-	-	-	-	-	-	-	-	-
Course Code	171CE8006-GREEN FUEL TECHNOLOGIES (OPEN ELECTIVE)	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	Summarize the different Coal Liquefaction techniques.	2	-	-	-	-	-	1	-	-	-	-	-	-	-
CO2	Identify the process steps involved in conversion of lignocellulosic materials into ethanol fuel	2	-	-	-	2	-	1	-	-	-	-	-	-	-

	CO Statements	POs												PSOs	
CO3	Analyze the Chemistry and Catalysts of Fischer-Tropsch synthesis in conversion of Natural gas into liquid fuels	2	-	2	-	2	-	1	-	-	-	-	-	-	-
CO4	Evaluate the chemical reaction mechanisms, catalysts and process technologies of Methane synthesis.	2	-	2	-	2	-	1	-	-	-	-	-	-	-
CO5	Outline the basic concepts of fuel cell technologies	2	-	-	-	2	-	1	-	-	-	-	-	-	-
Course Code	171EC8P02-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	2	-	-	-	1	1	1	-
CO2	Demonstrate technical skills of data collection and data analysis adhering to professional ethics	1	-	-	-	-	-	-	2	-	-	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	2	1