KLS Vishwanathrao Deshpande Institute of Technology
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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COs STATEMENTS FOR THE SCHEME 2017 (BATCH:2017 – 2021)

Sl. No.	Sub Name	COs	CO Statement
			1ST SEMESTER
1	Engineering Mathematics-I	17MAT11.1	To apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve
		17MAT11.2	To determine partial derivatives and Jacobians of functions
		17MAT11.3	To analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions
		17MAT11.4	To apply first order differential equations to various physical problems
		17MAT11.5	To determine solutions of system of linear equations, Quadratic and canonical forms
2	Engineering Chemistry	17CHE12.1	Knowledge on the types of electrodes, electrochemical and concentration cells, classical and modern batteries and fuel cells
		17CHE12.2	Knowledge on the causes and effects of corrosion of metals and control of corrosion. Modification of the surface properties of metals to develop resistance to corrosion, wear, tear, impact, etc. by electroplating and electroless plating.
		17CHE12.3	Knowledge on the importance of energy conservation in the context of energy crisis, fuel properties and importance of solar energy as sustainable source and PV cells for solar energy conversion.
		17CHE12.4	Knowledge on the unique properties of polymers and correlation of properties with polymer structure and versatility of polymers for various applications
		17CHE12.5	Knowledge on the boiler troubles, sewage treatment and desalination of sea water and overviewing of synthesis, properties and applications of nanomaterials.
3	Programming in C and Data Structures	17PCD13.1	Achieve knowledge of design and development of problem solving skills.
		17PCD13.2	Understand the basic principles of programming in C language.
		17PCD13.3	Design and develop modular programming skills.
		17PCD13.4	Effective utilization of memory using pointer technology,
		17PCD13.5	Understand the basic concepts of pre-processor directives, data structures & file operations
4	Computer Aided Engineering Drawing	17CED14.1	Student will able to demonstrate using CAD software
		17CED14.2	Student will able to visualize and draw orthographic projections , sections of solids and isometric views of solids
5	Basic Electronics	17ELN15.1	Understand the characteristics of PN Junction diode
		17ELN15.2	Understand the biasing methods of BJT and applications of BJT
		17ELN15.3	Discuss ideal and practical operational amplifier (op-amp) parameters and apply them to design various applications
		17ELN15.4	Describe the various types of modulation schemes and transducer applications
		17ELN15.5	Understand and apply the various Boolean Logic to build the combinational logics circuits and understand the applications of 8051 microcontrollers.
6	Computer Programming Lab.	17CPL16.1	Gaining knowledge of various parts of computers
		17CPL16.2	Able to draw flowchart and write algorithms
		17CPL16.3	Able design and development of C problem solving skills
		17CPL16.4	Able design and develop module programming skills
		17CPL16.5	Able to trace and debug the program
7	Engineering Chemistry Lab.	17CHEL17.1	Students will have the knowledge in handling different types of instruments for analysis of materials using small quantities of materials involved for quick and accurate results
		17CHEL17.2	Students will have the knowledge in carrying out different types of titrations for estimation of concerned in materials using comparatively more quantities of materials

			involved for good results
		2ND SEMESTER	
8	Engineering Mathematics-II	17MAT21.1	To solve differential equations of electrical circuits, forced oscillation of mass spring and elementary heat transfer
		17MAT21.2	To solve partial differential equations fluid mechanics, electromagnetic theory and heat transfer
		17MAT21.3	To evaluate double and triple integrals to find area , volume, mass and moment of inertia of plane and solid region
		17MAT21.4	To use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows
		17MAT21.5	To use Laplace transforms to determine general or complete solutions to linear ODE
9	Engineering Physics	17PHY22.1	Learn and understand intricacies of matter and energy which is essential to explore the role of subatomic particles in understanding properties of matter at macro, micro and nano level.
		17PHY222	Exploring the inadequacies of classical theory and to apply the principles of quantum mechanics which suites real time applications.
		17PHY223	Learn the niceties of technologically important material such as conductor, semiconductor and superconductor, their potential properties in understanding there use in engineering applications.
		17PHY224	Understand the physics of lasers and optical fibers and to appreciate their role in modern instruments.
		17PHY225	Understand the basics of crystal structures and apply to engineering field.
		17PHY226	Recognize the significance of shock waves and its applications in aerodynamics and aerospace engineering.
10	Elements of Civil Engg. and Mechanics	17CIV23.1	Know the basics of Civil Engineering, its scope of study, knowledge about roads, bridges and dams
		17CIV23.2	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies.
		17CIV23.3	Compute the reactive forces and the effects that develop as a result of the external loads
		17CIV23.4	Locate the Centroid and compute the Moment of Inertia of regular cross sections
		17CIV23.5	Express the relationship between the motion of bodies
11	Elements of Mechanical Engineering	17EME24.1	students shall demonstrate knowledge associated with various energy sources, formation of steam
		17EME24.2	student shall demonstrate knowledge associated with prime movers such as turbines and IC engines
		17EME24.3	students shall demonstrate knowledge associated with various metal removing process and robotics automation
		17EME24.4	students shall understanding of application and usage of various engineering materials
		17EME24.5	students shall demonstrate knowledge associated with refrigeration and air conditioning systems
12	Basic Electrical Engineering	17ELE25.1	**Students will be able to comprehend the basic concept of AC and DC circuit**
		17ELE25.2	Explain the working principle and construction of AC and DC machines
		17ELE25.3	Explain the working principle and construction of transformer
		17ELE25.4	Understand the electrical wiring concepts, earthing, domestic protection devices and electric shock
13	Workshop Practice	17WSL26.1	The Metal removal process by fitting practice and preparation of joints using appropriate fitting tools
		17WSL26.2	Preparation of welded joints
		17WSL26.3	Development of surfaces and forming models by soldering job.

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14	Engineering Physics Laboratory	17PHYL27.1	To recognize the importance of light by exploring its interaction with matter and in realizing its characteristic properties.
		17PHYL27.2	Understanding of mechanical properties of the material by the application of stress.
		17PHYL27.3	Appreciating the significance of elementary electric circuits in the functioning of various electric /electronic devices and gaining understanding of physics of the materials.
		17PHYL27.4	Design and implementation of electronic circuits to gain better understanding of physics of semiconductor devices.
		17PHYL27.5	Appreciating the role of Quantum mechanics in exploring the electrical properties of the materials.

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			3RD SEMESTER
15	Engineering Mathematics-III	17MAT31.1	To express the given function in terms of Fourier series
		17MAT31.2	To evaluate the infinite Fourier transform and Z-transform of various functions and its applications to solve difference equations.
		17MAT31.3	To study various numerical techniques to find the roots of an algebraic equation and understand the concept of correlation and regression for the given data
		17MAT31.4	To estimate function value using interpolation method and to evaluate definite integrals by numerical methods.
		17MAT31.5	To apply vector integral theorems to solve the integrals and to find the extremal of the functional
16	Electronic Instrumentation	17EC32.1	Define different types of measurement errors in instrumentation
		17EC32.2	Explain the various meters and designing various ranges meters and various instruments.
		17EC32.3	Sketch the diagram to elaborate the construction and operation of various Digital instruments e.g. CRO, Signal generators
		17EC32.4	Sketch the diagram to elaborate the construction and operation of various types of signal generators and measuring Instruments
		17EC32.5	Explain the different types of DC and AC bridges by deriving the expressions for balancing condition and analyze with numerical problems & also explain various types of transducers.
17	Analog Electronics	17EC33.1	Explain the characteristic parameters of the devices: BJT, JFET, MOSFET
		17EC33.2	Explain the basic circuit configuration (amplifiers/oscillators) using BJT, JFET, MOSFET
		17EC33.3	Analyse hybrid, r_e, pi model for BJT, JFET
		17EC33.4	Do the frequency analysis of BJT, JFET amplifiers
		17EC33.5	To understand different classes of power amplifiers
		17EC33.6	Understand and analyze various oscillator circuits
18	Digital Electronics	17EC34.1	Develop simplified switching equation using Karnaugh Maps and Quine-McClusky techniques
		17EC34.2	Explain the operation of decoders, encoders, multiplexers, demultiplexers, adders, subtractors and comparators
		17EC34.3	Explain the working of Latches and Flip Flops (SR,D,T and JK).
		17EC34.4	Design Synchronous/Asynchronous Counters and Shift registers using Flip Flops.
		17EC34.5	Develop Mealy/Moore Models and state diagrams for the given clocked sequential circuits.
		17EC34.6	Apply the knowledge gained in the design of Counters and Registers.
19	Network Analysis	17EC35.1	Describe, Apply and Analyze basic network concepts emphasizing Series and Parallel Combination of passive components, source transformation and shifting and mesh and nodal techniques for formulating the transfer function of networks
		17EC35.2	Apply and analyze various network theorems in solving the problems related to Electrical Circuits
		17EC35.3	Analyse the network by using Laplace as mathematical tool and to understand and analyse transients of 1st and 2nd order networks
		17EC35.4	Understand the concepts such as Q-factors and bandwidth of series and parallel resonance
		17EC35.5	Describe and analyze two port networks and methods of analyzing the Electrical Networks

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20	Engineering Electromagnetics	17EC36.1	Understand the coulomb's law & Electric field & to be familiar with different methods of calculation of Electric field due to various types of charge distribution
		17EC36.2	Apply the concept of Electric potential , passions & Laplace equation to the boundary value problem
		17EC36.3	Understand the different methods of calculation of Magnetic field , Magnetic vector potential due to various types of current carrying elements, Magneto static boundary conditions, force calculation between current carrying wires, torque on closed loops and solve related problems
		17EC36.4	Understand the concept of Faradays law & derive four Maxwell's equation for static & time varying
		17EC36.5	Understand the wave nature from Maxwell's equation & to understand wave propagation in different medium & to explore the concepts of skin depth &poynting's vector
21	Analog Electronics Lab	17ECL37.1	Test circuits of rectifiers, clipping circuits, clamping circuits and voltage regulators
		17ECL37.2	Determine the characteristics of BJT and FET amplifiers and plot its frequency response
		17ECL37.3	Compute the performance parameters of amplifiers and voltage regulators
		17ECL37.4	Design and test the basic BJT/FET amplifiers, BJT Power amplifier and oscillators
22	Digital Electronics Lab	17ECL38.1	Understand the basics of Digital Circuits and its applications.
		17ECL38.2	Have in-depth knowledge of designing combinational circuit and sequential circuit design
		17ECL38.3	Understand the device simulation on an EDA tool
4TH SEMESTER			
23	Engineering Mathematics-IV	17MAT41.1	To solve first and second order ODEs by various numerical methods.
		17MAT41.2	To apply numerical techniques to solve second order ODE and finding the series solutions of ODE's with variable coefficients.
		17MAT41.3	To understand the concept of complex functions
		17MAT41.4	To understand and determine probability distributions of discrete and continuous random variables for single and multiple variables
		17MAT41.5	To analyze samples by using various sampling techniques and to understand the stochastic process.
24	Signals & System	17EC42.1	Classify the signals as continuous/discrete, periodic/aperiodic, even/odd, energy/power and deterministic/random signals.
		17EC42.2	Determine the linearity, causality, time-invariance and stability properties of continuous and discrete time systems
		17EC42.3	Compute the response of a Continuous and Discrete LTI system using convolution integral and convolution sum
		17EC42.4	Determine the spectral characteristics of continuous and discrete time signal using Fourier analysis
		17EC42.5	Compute Z-transforms, inverse Z- transforms and transfer functions of complex LTI systems
25	Control Systems	17EC43.1	Know the benefits of using control system & to design & perform analysis on various control systems
		17EC43.2	Find out the transfer function of mechanical, electrical & electromechanical systems, block diagrams & signal flow graphs
		17EC43.3	Describe quantitatively transient response of first & second order systems
		17EC43.4	Understand & determine stability using Routh-Hurwitz technique & root locus technique
		17EC43.5	Learn the field of system stability which will be further enhanced by the knowledge of frequency response analysis like Polar plots, Bode plots etc
		17EC43.6	Find digital responses from the transfer function.Draw the block diagram from

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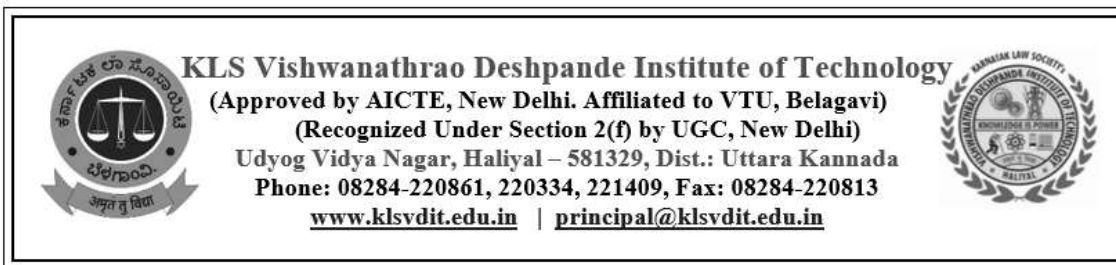Phone: 08284-220861, 220334, 221409, Fax: 08284-220813
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			dynamic equation & represent time
26	Principles of Communication System	17EC44.1	Design simple systems for generating and demodulating AM, DSB, SSB, VSB signals
		17EC44.2	Understand the concepts in Angle modulation for the design of communication systems
		17EC44.3	Design simple systems for generating and demodulating frequency modulated signals
		17EC44.4	Learn the concepts of random process and various types of noise
		17EC44.5	Evaluate the performance of the communication system in presence of noise
		17EC44.6	Analyze pulse modulation and sampling techniques
27	Linear Integrated Circuits	17EC45.1	Understand the Op-Amp circuit and parameters including CMRR, PSRR, Input & Output Impedances and Slew Rate.
		17EC45.2	Design Op-Amp based Inverting, Non-inverting, Summing & Difference Amplifier, and AC Amplifiers including Voltage Follower
		17EC45.3	Test circuits of Op-Amp based Voltage/ Current Sources & Sinks, Current, Instrumentation and Precision Amplifiers, linear and non-linear circuits comprising of limiting, clamping, Sample & Hold, Differentiator/ Integrator Circuits, Peak Detectors, Oscillators and Multiplier & Divider
		17EC45.4	Design first & second order Low Pass, High Pass, Band Pass, Band Stop Filters and Voltage Regulators using Op-Amps.
		17EC45.5	Explain applications of linear ICs in phase detector, VCO, DAC, ADC and Timer
28	Microprocessor	17EC46.1	comprehend with basic architecture of 8086 microprocessor.
		17EC46.2	Program 8086 microprocessor using assembly level language
		17EC46.3	Use macros and procedures in 8086 program
		17EC46.4	interfacing of 16bit microprocessor with memory and peripheral chips involving system design
		17EC46.5	comprehend architecture of 8088, 8087 coprocessor and other CPU architectures
29	Microprocessor Lab	17ECL47.1	Write and execute 8086 assembly level programs to perform data transfer, arithmetic and logical operations
		17ECL47.2	Perform string transfer, string reversing, searching a character in a string with string manipulation instructions of 8086 and Utilize procedures and macros in programming 8086
		17ECL47.3	Demonstrate the interfacing of 8086 with 7 segment display, matrix keyboard, logical controller, stepper motor, ADC, DAC, and LDR for simple applications
30	Linear ICs & Communication Lab	17ECL48.1	Illustrate the pulse and flat top sampling techniques using basic circuits
		17ECL48.2	Demonstrate addition and integration using linear ICs, and 555 timer operations to generate signals/pulses
		17ECL48.3	Demonstrate AM and FM operations and frequency synthesis
		17ECL48.4	Design and illustrate the operation of instrumentation amplifier, LPF, HPF, DAC and oscillators using linear IC
5TH SEMESTER			
31	Management & Entrepreneurship Development	17ES51.1	Apply basic Management functions in organization structure.
		17ES51.2	Select a best Entrepreneurship model for the required domain of establishment
		17ES51.3	Function as Manager, Entrepreneur and social responsibilities
		17ES51.4	Compare various types of Entrepreneurs
		17ES51.5	Prepare project feasibility report and analyze for selections of various state and central government agencies

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32	Digital Signal Processing	17EC52.1	Determine response of LTI systems using time domain and DFT techniques
		17EC52.2	Compute DFT of real and complex discrete time signals.
		17EC52.3	Computation of DFT using FFT algorithms and linear filtering approach
		17EC52.4	Solve problems on digital filter design and realize using digital computations.
33	Verilog HDL	17EC53.1	Differentiate between Verilog and VHDL descriptions.
		17EC53.2	Learn different Verilog HDL and VHDL constructs
		17EC53.3	Familiarize the gate and dataflow modelling in Verilog.
		17EC53.4	To infer knowledge of behavioural modelling in verilog.
		17EC53.5	To study VHDL modeling of digital circuits
34	Information Theory & Coding	17EC54.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source
		17EC54.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
		17EC54.3	Model the continuous and discrete communication channels using input, output and joint probabilities
		17EC54.4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
		17EC54.5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes
35	Operating System	17EC553.1	Explain the goals, structure, operation and types of operating systems.
		17EC553.2	Apply scheduling techniques to find performance factors
		17EC553.3	Explain organization of file systems and IOCS
		17EC553.4	Apply suitable techniques for contiguous and non-contiguous memory allocation.
		17EC553.5	Describe message passing, deadlock detection and prevention methods.
36	Automotive Electronics	17EC561.1	Discuss the fundamental concepts and basics of Electronic Engine control
		17EC561.2	Illustrate the working of Automobile and its interface with ECU
		17EC561.3	Appreciate the working principle of digital engine control system
		17EC561.4	Describe the importance of Networking communication protocol and motion control in automotive systems
37	DSP LABORATORY	17ECL57.1	Simulate discrete time signals and verification of sampling theorem
		17ECL57.2	Compute the DFT for a discrete signal and verification of its properties Using MATLAB.
		17ECL57.3	Find solution to the difference equations and computation of convolution and correlation along with the verification of properties.
		17ECL57.4	Compute and display the filtering operations and compare with Theoretical values.
		17ECL57.5	Implement the DSP computations on DSP hardware and verify the result
38	HDL LABORATORY	17ECL58.1	Write Verilog programs in gate, dataflow, behavioral & switch modeling levels of Abstraction
		17ECL58.2	Design and Verify the functionality of digital circuit/system using test benches
		17ECL58.3	Identify the suitable Abstraction levels for a particular digital design

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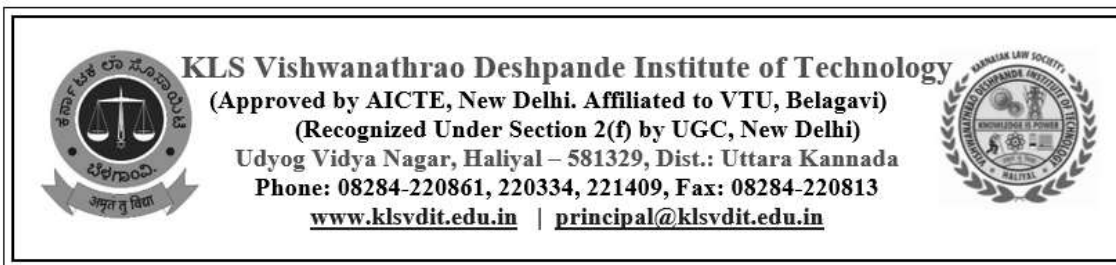Phone: 08284-220861, 220334, 221409, Fax: 08284-220813
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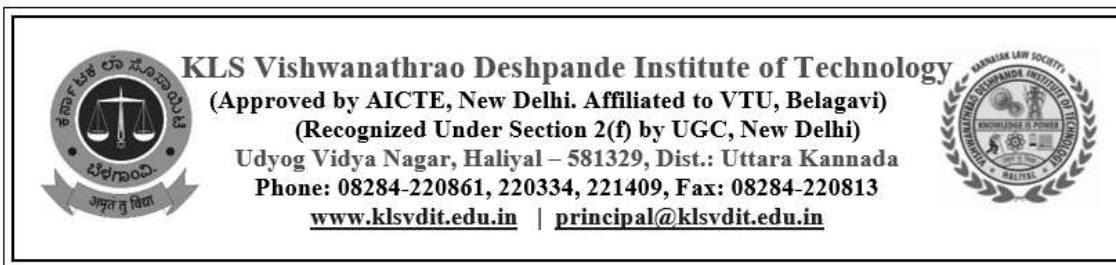
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			6TH SEMESTER
39	Digital Communication	17EC61.1	Associate and apply the concepts of bandpass sampling to well specified signals and channels.
		17EC61.2	Analyze and compute the performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels
		17EC61.3	Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels
		17EC61.4	Demonstrate by simulation and emulation that bandpass signals subjected to corrupted and distorted symbols in a bandlimited channel, can be demodulated and estimated at receiver to meet specified performance criteria
40	ARM Microcontroller & Embedded Systems	17EC62.1	Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3
		17EC62.2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications
		17EC62.3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system.
		17EC62.4	Develop the hardware /software co-design and firmware design approaches
		17EC62.5	Explain the need of real time operating system for embedded system applications
41	VLSI Design	17EC63.1	Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling
		17EC63.2	Draw the basic gates using the stick and layout diagrams with the knowledge of physical design aspects
		17EC63.3	Illustrate, design & analyze the subsystem process at system level & at reconfigurable hardware
		17EC63.4	Familiarize with memory elements & testing process in designing VLSI circuits
		17EC63.5	Design & develop digital circuits using modern VLSI tools
42	Computer Communication Networks	17EC64.1	Understand the fundamental concept of computer networks and distinguish between OSI model/TCP IP protocol suite with different layers involved
		17EC64.2	Identify different types of network topologies. Be familiar with the computer network protocols, and how they can be used to assist in network design and implementation
		17EC64.3	Understand the importance of Connecting Devices and IEEE Standards for Ethernet, Fast Ethernet and Gigabit Ethernet
		17EC64.4	Understand the concept of transparent bridges, forwarding, routing, sub netting and distinguish between IPv4 and IPv6 protocol
43	MICROELECTRONICS(17EC655)	17EC655.1	Explain the underlying physics and principles of operation of Metal oxide semiconductor (MOS) capacitors and MOS field effect transistors (MOSFETs).
		17EC655.2	Describe and apply simple large signal circuit models for MOSFETs
		17EC655.3	Analyze and design microelectronic circuits for linear amplifier for digital applications
		17EC655.4	Use of discrete MOS circuits to design Single stage and Multistage amplifiers to meet stated operating specifications
44	Python Application Programming	17CS664.1	Understand Python syntax and semantics and be fluent in the use of Python flow
		17CS664.2	Demonstrate proficiency in handling Strings and File Systems
		17CS664.3	Implement Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
		17CS664.4	Interpret the concepts of Object Oriented Programming as used in Python
		17CS664.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python
		17CS664.6	Develop simple applications using the latest Python trends and technologies

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45	EMBEDDED CONTROLLER LAB	17ECL67.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language.
		17ECL67.2	Develop assembly language programs using ARM Cortex M3 for different applications
		17ECL67.3	Interface external devices and I/O with ARM Cortex M3.
		17ECL67.4	Develop C language programs and library functions for embedded system applications
46	COMPUTER NETWORKS LABORATORY	17ECL68.1	Use the network simulator for learning and practice of networking algorithms
		17ECL68.2	Simulate the network with different configurations to measure the performance parameters
		17ECL68.3	Illustrate the operations of network protocols and algorithms using C programming
		17ECL68.4	Implement the data link and routing protocols using C programming
7TH SEMESTER			
47	Microwave and Antennas	17EC71.1	Analyze the working principle of various microwave sources and components.
		17EC71.2	Appreciate usage and working of microwave devices and realize them with the help of quantitative parameters.
		17EC71.3	Familiarize with basic antenna parameters and develop competency to design an antenna.
		17EC71.4	Design an antenna array by determining its performance parameters and analyze the various antenna dipole
		17EC71.5	Select an appropriate antenna for a given application
48	Digital Image Processing	17EC72.1	To Understand the image formation and the role of human visual system plays in perception of gray and color image data.
		17EC72.2	To apply image processing techniques in both the spatial and frequency (Fourier) domains.
		17EC72.3	To conduct independent study and analysis of Image Enhancement techniques
		17EC72.4	To understand color models and Morphological Image Processing
		17EC72.5	To design image analysis techniques in the form of image segmentation, representation and to evaluate the methodologies for segmentation.
49	Power Electronics	17EC73.1	Realize the construction and working of various power devices
		17EC73.2	Analyze the thyristor circuits for various triggering conditions
		17EC73.3	Study and analysis of thyristor circuits with different turn-off methods
		17EC73.4	Learn the applications of power devices in controlled rectifiers, converters and inverters under various load conditions
		17EC73.5	Appreciate the operation and characteristics of static switches and microelectronic relays.
50	Cryptography	17EC744.1	To understand some basic mathematical concepts and pseudo random number generators required to cryptography
		17EC744.2	To understand the basics of cryptography algorithms
		17EC744.3	To understand the authentication algorithms
51	IOT & Wireless Sensor Networks	17EC752.1	Understand various sources of IoT & M2M communication protocols
		17EC752.2	Describe Cloud computing and design principles of IoT
		17EC752.3	Become aware of MQTT clients, MQTT server and its programming.
		17EC752.4	Understand the architecture and design principles of WSNs
		17EC752.5	Enrich the knowledge about MAC and routing protocols in WSNs

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COs STATEMENTS FOR THE SCHEME 2017 (BATCH:2017 – 2021)

52	Advanced Communication Lab	17ECL76.1	Determine the characteristics and response of microwave devices and optical waveguide
		17ECL76.2	Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it
		17ECL76.3	Simulate the digital modulation schemes with the display of waveforms and computation of performance parameters
		17ECL76.4	Design and test the digital modulation circuits/systems and display the waveforms
53	VLSI Lab	17ECL77.1	To describe various digital circuits and simulate them using test benches
		17ECL77.2	Interpret concepts of DC Analysis, AC Analysis and Transient Analysis in analog circuits
		17ECL77.3	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers
		17ECL77.4	Use basic amplifiers and further design higher level circuits like operational amplifier and analog/digital converters to meet desired parameters
		17ECL77.5	Use transistors to design gates and further using gates realize shift registers and adders to meet desired parameters
54	Project Work Phase–I + Project work Seminar	17ECP78.1	Design, Implementation of System to measure the performance parameters, optimally
		17ECP78.2	Analysing the outcomes of the experiment in software / hardware through comparison
		17ECP78.3	Imbibing professional ethics in report writing in a systematic manner and adopting to quality presentation
8TH SEMESTER			
55	Wireless Cellular and LTE 4G Broadband	17EC81.1	Understand the system architecture and the functional standard specified in LTE 4G.
		17EC81.2	Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users
		17EC81.3	Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios
		17EC81.4	Test and Evaluate the Performance of resource management and packet data processing and transport algorithms
56	Fiber Optics & Networks	17EC82.1	Classification and working of optical fiber with different modes of signal propagation.
		17EC82.2	Describe the transmission characteristics and losses in optical fiber communication.
		17EC82.3	Describe the construction and working principle of optical connectors, multiplexer and amplifier
		17EC82.4	Describe the constructional features and the characteristics of optical sources and detectors
		17EC82.5	Illustrate the networking aspects of optical fiber and describe various standards associated with it
57	Network and Cyber Security	17EC835.1	Explain network security protocols
		17EC835.2	Understand security concerns in Email and Internet Protocol
		17EC835.3	Discuss the cyber security problems
		17EC835.4	Explain and apply Cyber Security Framework
58	Internship/Professional Practice	CO1	To understand the theory concepts and implement the same in Industry Environment
59	Project Work	17ECP85.1	Design, Implementation of System to measure the performance parameters, optimally
		17ECP85.2	Analysing the outcomes of the experiment in software / hardware through comparison
		17ECP85.3	Imbibing professional ethics in report writing in a systematic manner and adopting to quality presentation

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60	Seminar	17ECS86.1	Read, Understand and Analyze Technical Reports from reputed International Journals / Magazines / Product Manuals
		17ECS86.2	Prepare essential contents for the topic in a prescribed format and express the knowledge gained through Presentation
		17ECS86.3	Imbibe Professional Ethics in the preparation of Report, Presentation and acknowledge the resources used in content formulation

Head of the Department
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