



KLS Vishwanathrao Deshpande Institute of Technology

(Approved by AICTE, New Delhi. Affiliated to VTU, Belagavi)

(Recognized Under Section 2(f) by UGC, New Delhi)

Udyog Vidya Nagar, Haliyal – 581329, Dist.: Uttara Kannada

Phone: 08284-220861, 220334, 221409, Fax: 08284-220813

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COs STATEMENTS FOR THE SCHEME 2015 (BATCH:2016 – 2020)

Sl. No.	Sub Name	CO's	CO Statement
1	Engineering Maths-I	15MAT11.1	To apply the knowledge of calculus to solve problems related to polar curves and its applications in determining the bentness of a curve.
		15MAT11.2	To use partial derivatives to calculate rates of change of multivariate functions.
		15MAT11.3	To analyze position, velocity, and acceleration in two or three dimensions using the calculus of vector valued functions.
		15MAT11.4	To recognize and solve first-order ordinary differential equations, Newton's law of cooling.
		15MAT11.5	To use matrices techniques for solving systems of linear equations in the different areas of Linear Algebra
2	Engineering Physics	15PHY12.1	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.
		15PHY12.2	Exploring the inadequacies of classical theory and to apply the principles of quantum mechanics which suites real time applications.
		15PHY12.3	Learn the niceties of technologically important material such as conductor, semiconductor and superconductor, their potential properties in understanding there use in engineering applications.
		15PHY12.4	Understand the physics of lasers and optical fibers and to appreciate their role in modern instruments.
		15PHY12.5	Understand the basics of crystal structures and apply to engineering field.
		15PHY12.6	Recognize the significance of shock waves and its applications in aerodynamics and aerospace engineering.
3	Elements of Civil Engg. & Mechanics	15CIV13.1	Know the basics of Civil Engineering, its scope of study, knowledge about roads,bridges and dams
		15CIV13.2	Comprehend the action of Forces, Moments and other loads on systems of rigid bodies.
		15CIV13.3	Compute the reactive forces and the effects that develop as a result of the external loads
		15CIV13.4	Locate the Centroid and compute the Moment of Inertia of regular cross sections
		15CIV13.5	Express the relationship between the motion of bodies
4	Elements of Mechanical Engineering	15EME	students shall demonstrate knowledge associated with various energy sources, formation of steam
			student shall demonstrate knowledge associated with prime movers such as turbines and IC engines
		CO3	students shall demonstrate knowledge associated with various metal removing process and robotics automation
		CO4	students shall understanding of application and usage of various engineering materials
		CO5	students shall demonstrate knowledge associated with refrigeration and air conditioning systems
5	Basic Electrical Engineering	15ELE14.1	Students will be able to comprehend the basic concept of AC and DC circuit
		15ELE14.2	Explain the working principle and construction of AC and DC machines
		15ELE14.3	Explain the working principle and construction of transformer
		15ELE14.4	Understand the electrical wiring concepts, earthing, domestic protection devices and electric shock
6	Workshop Practice	15WSL16.1	The Metal removal process by fitting practice and preparation of joints using appropriate fitting tools
		15WSL16.2	Preparation of welded joints
		15WSL16.3	Development of surfaces and forming models by soldering job.



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7	Engg. Physics Lab.	15PHYL17.1	To recognize the importance of light by exploring its interaction with matter and in realizing its characteristic properties.
		15PHYL17.2	Understanding of mechanical properties of the material by the application of stress.
		15PHYL17.3	Appreciating the significance of elementary electric circuits in the functioning of various electric /electronic devices and gaining understanding of physics of the materials.
		15PHYL17.4	Design and implementation of electronic circuits to gain better understanding of physics of semiconductor devices.
		15PHYL17.5	Appreciating the role of Quantum mechanics in exploring the electrical properties of the materials.
8	Engineering Maths-II	15MAT21.1	To solve differential equations of electrical circuits, forced oscillation of mass spring and elementary heat transfer
		15MAT21.2	To solve partial differential equations fluid mechanics, electromagnetic theory and heat transfer
		15MAT21.3	To evaluate double and triple integrals to find area, volume, mass and moment of inertia of plane and solid region.
		15MAT21.4	To use curl and divergence of a vector valued functions in various applications of electricity, magnetism and fluid flows
		15MAT21.5	To use Laplace transforms to determine general or complete solutions to linear ODE
9	Engineering Chemistry	15CHE22.1	Knowledge on the types of electrodes, electrochemical and concentration cells, classical and modern batteries and fuel cells
		15CHE22.2	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.
		15CHE22.3	Knowledge on the importance of energy conservation in the context of energy crisis, fuel properties and propose some amicable alternatives for energy which are also sustainable.
		15CHE22.4	Knowledge on the replacement of conventional materials by polymers for various applications
		15CHE22.5	Knowledge on the boiler troubles, sewage treatment and desalination of sea water and overviewing of synthesis, properties and applications of nanomaterials.
10	Programming in C & Data Structures	15CED23.1	Achieve knowledge of design and development of problem solving skills.
		15CED23.2	Understand the basic principles of programming in C language.
		15CED23.3	Design and develop modular programming skills.
		15CED23.4	Effective utilization of memory using pointer technology,
		15CED23.5	Understand the basic concepts of preprocessor directives, data structures & file operations
11	Computer Aided Engineering Drawing	15CED24.1	Students will be able to demonstrate the usage of CAD software.
		15CED24.2	Students will be able to visualize and draw projection of points and lines
		15CED24.3	Students will be able to visualize and draw Orthographic projections, Sections of solids and Isometric views of solids
		15CED24.4	Students are evaluated for their ability in applying various concepts to solve practical problems related to engineering drawing
12	Basic Electronics	15ELN25.1	Understand the characteristics of PN Junction diode
		15ELN25.2	Understand the biasing methods of BJT and applications of BJT
		15ELN25.3	Discuss ideal and practical operational amplifier (op-amp) parameters and apply them to design various applications
		15ELN25.4	Describe the various types of modulation schemes and transducer applications
		15ELN25.5	Understand and apply the various Boolean Logic to build the combinational logics circuits and understand the applications of 8051 microcontrollers.



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13	Computer Programming Lab.	15CPL26.1	Gaining knowledg of varioursparts of computers
		15CPL26.2	Able to draw flowchart and write algorithms
		15CPL26.3	Able design and development of C problem solving skills
		15CPL26.4	Able design and develop module programming skills
		15CPL26.5	Able tto trace and debug the program
14	Engineering Chemistry Lab.	15CHEL27.1	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
		15CHEL27.2	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



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3 rd SEMESTER			
15	Engineering Mathematics-III	15MAT31.1	To know the use of periodic signals and to calculate Fourier series of periodic as well as non-periodic functions.
		15MAT31.2	To find the infinite Fourier transform and Z-transform of various functions and its applications to solve difference equations.
		15MAT31.3	To employ appropriate numerical methods to solve algebraic and transcendental equations
		15MAT31.4	To calculate the values of unknowns by various numerical methods and solve the definite integrals by various numerical methods.
		15MAT31.5	To apply vector integral theorems to solve the integrals and to find the extremal of the functional
16	Analog Electronics	15EC32.1	To understand the modelling of transistor using hybrid equivalent model and Re model, perform the analysis of amplifier parameters at low frequencies for different configurations & student should be able to the analysis of Cascaded&Cascode system with example
		15EC32.2	to understand the construction & VI characteristic of different types of FETS & their different biasing scheme.
		15EC32.3	To understand the modeling of FET amplifiers & analysis of amplifier parameters. Understand the method of analysing frequency response of BJT & FET amplifier with tool of bode plot
		15EC32.4	To understand the different class of power amplifier with analysis of their efficiency & their applications
		15EC32.5	To understand the concept of feedback & types of feedback, apply concept of positive feedback to oscillator & study of different types of oscillators
17	Digital Electronics	15EC33.1	familiar with basic logic gates and independently builds simple logic circuits using basic and universal gates. Understand Boolean algebra and able to simplify boolean functions using K-maps.
		15EC33.2	design combinational logic circuits using Quine Mc-Cluskey method and problems with Don't cares
		15EC33.3	understand single IC solutions of combinational Logic Using Decoders, Encoders, Multiplexers, Demultiplexers, comparators, adders etc..
		15EC33.4	familiar with basic sequential logic components: SR, JK, T&D latches and flipflops and their usage with capability to analyse sequential logic circuits such as shift registers, counters, types of counters with design procedure.
		15EC33.5	Understand state machines notations concept and do sequential circuit design based state machines notations and state table using SR FF, JK FF and D FF's
18	Network Analysis	15EC34.1	Describe, Apply and Analyse basic network concepts emphasizing Series and Parallel Combination of Passive Components, Source Transformation, mesh and nodal techniques
		15EC34.2	Apply and analyse various network theorems in solving the problems related to Electrical Circuits
		15EC34.3	Analyse the network by using Laplace as mathematical tool and to understand and analyse transients of 1st and 2nd order networks
		15EC34.4	Understand the concepts such as Q-factors and bandwidth of series and parallel resonance
		15EC34.5	Describe and analyse two port networks and methods of analysing the Electrical Networks
19	Electronic Instrumentation	15EC35.1	Define different types of measurement errors in instrumentation
		15EC35.2	Explain the various meters and designing various ranges meters and various instruments.
		15EC35.3	Sketch the diagram to elaborate the construction and operation of various Digital instruments e.g. CRO, Signal generators
		15EC35.4	Sketch the diagram to elaborate the construction and operation of various types of signal generators and measuring Instruments



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		15EC35.5	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.
20	Engineering Electromagnetics	15EC36.1	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
		15EC36.2	Apply the concept of Electric potential , passions & Laplace equation to the boundary value problem
		15EC36.3	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
		15EC36.4	Understand the concept of Faradays law & derive four Maxwell's equation for static & time varying
		15EC36.5	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	15ECL37.1	Test circuits of rectifiers, clipping circuits, clamping circuits and voltage regulators
		15ECL37.2	Determine the characteristics of BJT and FET amplifiers and plot its frequency response
		15ECL37.3	Compute the performance parameters of amplifiers and voltage regulators
		15ECL37.4	Design and test the basic BJT/FET amplifiers, BJT Power amplifier and oscillators
22	Digital Electronics Lab	15ECL38.1	Understand the basics of Digital Circuits and its applications.
		15ECL38.2	Have in-depth knowledge of designing combinational circuit and sequential circuit design
		15ECL38.3	Understand the device simulation on an EDA tool
4TH SEMESTER			
23	Engineering Mathematics-IV	15MAT41.1	To solve higher order differential equation by various numerical techniques
		15MAT41.2	To solve the ordinary and partial differential equation by using special functions
		15MAT41.3	To interpret the analyticity, calculate potential field residues and poles of complex potentials.
		15MAT41.4	To calculate and analyze the probability distribution of the given statistical data
		15MAT41.5	To analyze statistical inference based on the sampling distribution
24	Microprocessor	15EC42.1	comprehend with basic architecture of 8086 microprocessor.
		15EC42.2	Program 8086 microprocessor using assembly level language
		15EC42.3	Use macros and procedures in 8086 program
		15EC42.4	interfacing of 16bit microprocessor with memory and peripheral chips involving system design
		15EC42.5	comprehend architecture of 8088, 8087 coprocessor and other CPU architectures
25	Control System	15EC43.1	Know the benefits of using control system & to design & perform analysis on various control systems
		15EC43.2	Find out the transfer function of mechanical, electrical & electromechanical systems, block diagrams & signal flow graphs
		15EC43.3	Describe quantitatively transient response of first & second order systems
		15EC43.4	Understand & determine stability using Routh-Hurwitz technique & root locus technique
		15EC43.5	Learn the field of system stability which will be further enhanced by the knowledge of frequency response analysis like Polar plots, Bode plots etc
		15EC43.6	Find digital responses from the transfer function. Draw the block diagram from



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			dynamic equation & represent time
26	Signals & System	15EC44.1	Classify the signals as continuous/discrete, periodic/apperiodic, even/odd, energy/power and deterministic/random signals.
		15EC44.2	Determine the linearity, causality, time-invariance and stability properties of continuous and discrete time systems
		15EC44.3	Compute the response of a Continuous and Discrete LTI system using convolution integral and convolution sum
		15EC44.4	Determine the spectral characteristics of continuous and discrete time signal using Fourier analysis
		15EC44.5	Compute Z-transforms, inverse Z- transforms and transfer functions of complex LTI systems
27	Principles of Communication System	15EC45.1	Design simple systems for generating and demodulating AM, DSB, SSB, VSB signals.
		15EC45.2	Understand the concepts in Angle modulation for the design of communication systems
		15EC45.3	Design simple systems for generating and demodulating frequency modulated signals
		15EC45.4	Learn the concepts of random process and various types of noise
		15EC45.5	Evaluate the performance of the communication system in presence of noise
		15EC45.6	Analyze pulse modulation and sampling techniques
28	Linear Integrated Circuits	15EC46.1	To study the basic principles, configurations and practical limitations of op-amp.
		15EC46.2	To understand the various linear and non-linear applications of op-amp
		15EC46.3	To analyze and deign op-amp oscillators, single chip oscillators and frequency generators
		15EC46.4	To analyze, design and explain the characteristics and applications of active filters
		15EC46.5	To understand the operation of the most commonly used D/A and A/D converter types and its applications
29	Microprocessor Lab	15ECL47.1	Write and execute 8086 assembly level programs to perform data transfer, arithmetic and logical operations
		15ECL47.2	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
		15ECL47.3	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	15ECL48.1	Illustrate the pulse and flat top sampling techniques using basic circuits
		15ECL48.2	Demonstrate addition and integration using linear ICs, and 555 timer operations to generate signals/pulses
		15ECL48.3	Demonstrate AM and FM operations and frequency synthesis
		15ECL48.4	Design and illustrate the operation of instrumentation amplifier, LPF, HPF, DAC and oscillators using linear IC



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5 TH SEMESTER			
31	Management & Entrepreneurship Development	15ES51.1	Understand the functions of management differentiate between Administration and Management and know about planning and decision making
		15ES51.2	Learn the principles of organization, importance of staffing, leadership qualities, styles, communication and motivation
		15ES51.3	Learn the importance of business and its responsibilities along with concepts of entrepreneurship
		15ES51.4	Understand the importance and use of SSI and Govt. schemes that promote SSI
		15ES51.5	Learn and prepare project report along with study of PERT and CPM control techniques
32	Digital Signal Processing	15EC52.1	Determine response of LTI systems using time domain and DFT techniques.
		15EC52.2	Compute DFT of real and complex discrete time signals.
		15EC52.3	Compute DFT using FFT algorithms and linear filtering approach.
		15EC52.4	Solve problems on digital filter design and realize using digital computations.
33	Verilog HDL	15EC53.1	Realize programs in VHDL/verilog in data-flow, behavioral and gate-level modeling styles.
		15EC53.2	Design testbench for verifying functionality of digital circuits/system
		15EC53.3	Apply verilog tasks and directives for timing and delay simulation.
		15EC53.4	Use EDA tools in digital circuit modelsim - simulation and functional verification.
34	Information Theory & Coding	15EC54.1	Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source
		15EC54.2	Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms
		15EC54.3	Model the continuous and discrete communication channels using input, output and joint probabilities
		15EC54.4	Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes & convolutional codes
		15EC54.5	Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes
35	Operating System	15EC553.1	To understand the goals and structure of the operating system
		15EC553.2	To study the operation, process management, threads of the Operating system
		15EC553.3	To understand the concept of memory management and virtual memory
		15EC553.4	To study Scheduling algorithms
		15EC553.5	To study different files types, operations and also about message passing
36	Automotive Electronics	15EC561.1	Acquire an overview of automotive components, subsystems, and basics of Electronic Engine Control in today's automotive industry
		15EC561.2	Use available automotive sensors and actuators while interfacing with microcontrollers / microprocessors during automotive system design
		15EC561.3	Analyze the networking of various modules in automotive systems, communication protocols and diagnostics of the sub systems
		15EC561.4	Design and implement the electronics that attribute the reliability, safety, and smartness to the automobiles, providing add-on comforts and get fair idea on future Automotive Electronic Systems
37	Object Oriented Programming Using C++	15EC562.1	Understand Encapsulation, Inheritance and Polymorphism and Solve the problem with object-oriented approach.
		15EC562.2	Analyze the problem statement and build object-oriented system model
		15EC562.3	Understand function overloading, operator overloading and virtual functions



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		15EC562.4	Understand and differentiate the advantages of object-oriented programming over procedure-oriented programming
38	Digital Signal Processing Lab	15ECL57.1	Simulate discrete time signals and verification of sampling theorem
		15ECL57.2	Compute the DFT for a discrete signal and verification of its properties Using MATLAB
		15ECL57.3	Find solution to the difference equations and computation of convolution and correlation along with the verification of properties.
		15ECL57.4	Compute and display the filtering operations and compare with Theoretical value
		15ECL57.5	Implement the DSP computations on DSP hardware and verify the result
39	HDL Lab	15ECL58.1	Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate level Abstractions
		15ECL58.2	Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms.
		15ECL58.3	Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware
		15ECL58.4	Interface the hardware to the programmable chips and obtain the required output.
6TH SEMESTER			
40	Digital Communication	15EC61.1	Associate and apply the concepts of bandpass sampling to well specified signals and channels and understand the process of converting bandpass signal into low pass signal and vice-versa and the different forms of digital signal representation in its baseband forms. Interpret the concepts of bandpass signals and discuss the various forms of digital signal representation
		15EC61.2	Analyze the mathematical model of AWGN channels, concepts of orthogonality and different types of receivers
		15EC61.3	To understand different types of modulation techniques and their comparable analysis
		15EC61.4	To understand the dispersive nature of channel using ISI technique and measurement of dispersion using eye diagram
		15EC61.5	Highlight the importance of spread spectrum techniques for providing the security for communication system.
41	ARM Microcontroller & Embedded Systems	15EC62.1	Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3
		15EC62.2	Apply the knowledge gained for Programming ARM Cortex M3 for different applications
		15EC62.3	Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system
		15EC62.4	Develop the hardware /software co-design and firmware design approaches
		15EC62.5	Explain the need of real time operating system for embedded system applications.
42	VLSI Design	15EC63.1	Comprehend the physics of various types of MOSFET and its characteristics, inverter topologies in CMOS and BICMOS and fabrication of IC in different technologies
		15EC63.2	Design digital CMOS circuits and layouts using stick diagram familiarizing with different CMOS logic styles along with the design of memories with efficient architectures
		15EC63.3	Have an ability to design elementary data paths for microprocessors, including moderate-speed adder, subtractors and multipliers and to do the estimation of parasitic capacitance, study its impact on scaling and performance
		15EC63.4	Identify the significance of testable design & techniques to improve the fault coverage, detailed idea on the concepts of floor planning
		15EC63.5	Design actual CMOS subsystems in hardware languages of as a part of mini projects lab session along with several assignments covering the core concepts and reinforcing analytical skills learned in class and discuss the sections further so as to better the learning experience



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43	Computer Communication Network (15EC64)	15EC64.1	understand the fundamental concept of computer networks and distinguish between OSI model/TCP IP protocol suite with different layers involved
		15EC64.2	identify different types of network topologies. Be familiar with the basic protocols of computer networks, and how they can be used to assist in network
		15EC64.3	Understand the concept of transparent bridges, forwarding, routing, sub netting and distinguish between IPv4 and IPv6 protocol
		15EC64.4	understand the importance of IEEE Standards for Ethernet, Fast Ethernet & Gigabit Ethernet
		15EC64.5	perform an independent study and ability to adapt for continuous learning by carrying out seminars on recent trends in computer networks
44	Digital Switching Systems	15EC654.1	understand the working principle of switching systems involved in telecommunication switching
		15EC654.2	learn about Iarchitecture, signaling and control of EPABX,
		15EC654.3	Analysis of basic telecommunication traffic theory
		15EC654.4	design multistage switching structures involving time and space switching stages.
		15EC654.5	adapt to the continuous learning method and also to conduct independent study of digital systems
45	Microelectronics	15EC655.1	Explain the underlying physics and principles of operation of Metal oxide semiconductor (MOS) capacitors and MOS field effect transistors
		15EC655.2	Describe and apply various biasing schemes for MOS amplifiers and to perform frequency analysis
		15EC655.3	Analyze and design microelectronic circuits like current steering circuits and current mirror circuits for linear amplifier
		15EC655.4	To Comprehend the working of amplifiers with active loads with frequency response
		15EC655.5	Contrast the input/output and gain characteristics of single-transistor, differential and common two-transistor linear amplifier building block stages
46	Python Application Programming	15CS664.1	Understand Python syntax and semantics and be fluent in the use of Python flow control and functions.
		15CS664.2	Demonstrate proficiency in handling Strings and File Systems
		15CS664.3	Implement Python Programs using core data structures like Lists, Dictionaries and use Regular Expressions
		15CS664.4	Interpret the concepts of Object Oriented Programming as used in Python
		15CS664.5	Implement exemplary applications related to Network Programming, Web Services and Databases in Python
		15CS664.6	Develop simple applications using the latest Python trends and technologies
47	Embedded Controller Lab	15ECL67.1	Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language
		15ECL67.2	Develop assembly language programs using ARM Cortex M3 for different applications
		15ECL67.3	Interface external devices and I/O with ARM Cortex M3.
		15ECL67.4	Develop C language programs and library functions for embedded system applications
48	Computer Networks lab	15ECL68.1	Use the network simulator for learning and practice of networking algorithms
		15ECL68.2	Illustrate the operations of network protocols and algorithms using C programming.
		15ECL68.3	Simulate the network with different configurations to measure the performance parameters.
		15ECL68.4	Implement the data link and routing protocols using C programming..



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7 th SEMESTER			
49	Microwave & Antenna(15EC71.1	Analyze the working principle of various microwave sources and components.
		15EC71.2	Appreciate usage and working of microwave devices and realize them with the help of quantitative parameters.
		15EC71.3	Familiarize with basic antenna parameters and develop competency to design an antenna.
		15EC71.4	Design an antenna array by determining its performance parameters and analyze the various antenna dipole
		15EC71.5	Select an appropriate antenna for a given application
50	Digital Image Processing	15EC72.1	Understand image formation and the role human visual system plays in perception of gray and color image data
		15EC72.2	Apply image processing techniques in both the spatial and frequency (Fourier) domains.
		15EC72.3	Conduct independent study and analysis of Image Enhancement techniques
		15EC72.4	Understand color models and Morphological Image Processing
		15EC72.5	Design image analysis techniques in the form of image segmentation, representation and to evaluate the Methodologies for segmentation
51	Power Electronics	15EC73.1	Realize the construction and working of various power devices
		15EC73.2	Analyze the thyristor circuits for various triggering conditions
		15EC73.3	Study and analysis of thyristor circuits with different turn-off methods
		15EC73.4	Learn the applications of power devices in controlled rectifiers, converters and inverters under various load conditions
		15EC73.5	Appreciate the operation and characteristics of static switches and microelectronic relays.
52	Cryptography	15EC744.1	To understand some basic mathematical concepts and pseudo random number generators required to cryptography
		15EC744.2	To understand the basics of cryptography algorithms
		15EC744.3	To understand the authentication algorithms
53	DSP Algorithms & Architecture	15EC751.1	Figure out the knowledge and concepts of digital signal processing techniques
		15EC751.2	Understand the computational building blocks of DSP processors and its speed issue
		15EC751.3	Understand the various addressing modes, peripherals, interrupts and pipelining structure of TMS320C54xx processor
		15EC751.4	Learn how to interface the external devices to TMS320C54xx processor in various modes
		15EC751.5	Understand basic DSP algorithms with their implementation
54	Advanced Communication Laboratory	15ECL76.1	Determine the characteristics and response of microwave devices and optical waveguide.
		15ECL76.2	Determine the characteristics of microstrip antennas and devices and compute the parameters associated with it.
		15ECL76.3	Simulate the digital modulation schemes with the display of waveforms and computation of performance parameters
		15ECL76.4	Design and test the digital modulation circuits/systems and display the waveforms.
55	VLSI LABORATORY	15ECL77.1	To describe various digital circuits and simulate them using test benches
		15ECL77.2	Interpret concepts of DC Analysis, AC Analysis and Transient Analysis in analog circuits
		15ECL77.3	Design and simulate basic CMOS circuits like inverter, common source amplifier and differential amplifiers



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		15ECL77.4	Use basic amplifiers and further design higher level circuits like operational amplifier and analog/digital converters to meet desired parameters
		15ECL77.5	Use transistors to design gates and further using gates realize shift registers and adders to meet desired parameters
8th SEMESTER			
56	Wireless Cellular and LTE 4G Broadband	15EC81.1	Understand the system architecture and the functional standard specified in LTE 4G.
		15EC81.2	Analyze the role of LTE radio interface protocols and EPS Data convergence protocols to set up, reconfigure and release data and voice from users
		15EC81.3	Demonstrate the UTRAN and EPS handling processes from set up to release including mobility management for a variety of data call scenarios
		15EC81.4	Test and Evaluate the Performance of resource management and packet data processing and transport algorithms
57	Fiber optics & Networks	15EC82.1	Classification and working of optical fiber with different modes of signal propagation
		15EC82.2	Describe the transmission characteristics and losses in optical fiber communication
		15EC82.3	Describe the construction and working principle of optical connectors, multiplexer and amplifier
		15EC82.4	Describe the constructional features and the characteristics of optical sources and detectors
		15EC82.5	Illustrate the networking aspects of optical fiber and describe various standards associated with it
58	NETWORK AND CYBER SECURITY	15EC835.1	Explain network security protocols
		15EC835.2	Understand security concerns in Email and Internet Protocol
		15EC835.3	Discuss the cyber security problems
		15EC835.4	Explain and apply Cyber Security Framework


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