Cambridge Institute of Technology

Department of Electronics & Communications Engineering

Course outcomes of 2018 scheme

Course Code	Course Name	Course Outcomes-On completion of this course the students will be able to
		3RD SEMESTER
18MAT31	Transform Calculus, Fourier Series And Numerical Techniques	CO1: Use Laplace transform and inverse Laplace transform in solving differential/ integral equation arising in network analysis, control systems and other fields of engineering. CO2: Demonstrate Fourier series to study the behaviour of periodic functions and their applications in system communications, digital signal processing and field theory. CO3: Make use of Fourier transform and Z-transform to illustrate discrete/continuous function arising in wave and heat propagation, signals and systems. CO4: Solve first and second order ordinary differential equations arising in engineering problems using single step and multistep numerical methods. CO5: Determine the externals of functional using calculus of variations and solve problems arising in dynamics of rigid bodies and vibrational analysis.
18EC32	Network Theory	CO1: Determine currents and voltages using source transformation/ source shifting/ mesh/ nodal analysis and reduce given network using star-delta transformation/source transformation/ source shifting. CO2: Solve network problems by applying Superposition/ Reciprocity/ Thevenin‘s/ Norton‘s/ Maximum Power Transfer/ Millman‘s Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions. CO3: Calculate current and voltages for the given circuit under transient conditions. CO4: Apply Laplace transform to solve the given network. CO5: Solve the given network using specified two port network parameter like Z or Y or Tor h. C06: Understand the concept of resonance.
18EC33	Electronic Devices	CO1: Understand the principles of semiconductor Physics. CO2: Understand the principles and characteristics of different types of semiconductor devices.

		CO3: Understand the fabrication process of semiconductor devices. CO4: Utilize the mathematical models of semiconductor junctions and MOS transistors for circuits and systems.
18EC34	Digital System Design	CO1: Explain the concept of combinational and sequential logic circuits. CO2: Design the combinational logic circuits. CO3: Design the sequential circuits using SR, JK, D, T flip-flops and Mealy & Moore machines CO4: Design applications of Combinational & Sequential Circuits.
18EC35	Computer Organization And Architecture	CO1:.Explain the basic organization of a computer system. CO2:Explain different ways of accessing an input / output device including interrupts. CO3:Illustrate the organization of different types of semiconductor and other secondary storage memories. CO4: Illustrate simple processor organization based on hardwired control and micro programmed control
18EC36	Power Electronics And Instrumentation	CO1:Build and test circuits using power electronic devices. CO2:Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters and SMPS. CO3:Define instrument errors. CO4: Develop circuits for multirange Ammeters, Voltmeters and Bridges to measure passive component values and frequency. CO4: Describe the principle of operation of Digital instruments and PLCs. CO5:Use Instrumentation amplifier for measuring physical parameters..
18ECL37	Electronic Devices And Instrumentation Laboratory	CO1:Understand the characteristics of various electronic devices and measurement of parameters. CO2:Design and test simple electronic circuits CO3:Use of circuit simulation software for the implementation and characterization of electronic circuits and devices.
18ECL38	Digital System Design Laboratory	CO1:Demonstrate the truth table of various expressions and combinational circuitsusing logic gates. CO2:Design various combinational circuits such as adders, subtractors,comparators, multiplexers and demultiplexers. CO3:Construct flips-flops, counters and shift registers. CO4:Simulate Serial adder and Binary Multiplier.
18MATDIP 31	Additional Mathematics – I	CO1: Apply concepts of complex numbers and vector algebra to analyze the problems arising in related area. CO2: Use derivatives and partial derivatives to calculate rate of change of multivariate functions. CO3: Analyze position, velocity and acceleration in two and three dimensions of vector valued functions. CO4: Learn techniques of integration including the evaluation of double and triple integrals. CO5: Identify and solve first order ordinary differential equations.
4^{TH} SEMESTER		

18MAT41	Complex Analysis, Probability And Statistical Methods	CO1: Use the concepts of analytic function and complex potentials to solve the problems arising in electromagnetic field theory. CO2: Utilize conformal transformation and complex integral arising in aerofoil theory, fluid flow visualization and image processing. CO3: Apply discrete and continuous probability distributions in analyzing the probability models arising in engineering field. CO4: Make use of the correlation and regression analysis to fit a suitable mathematical model for the statistical data. CO5: Construct joint probability distributions and demonstrate the validity of testing the hypothesis. and optimization concepts of stability of design and structural engineering.
18EC42	Analog Circuit	CO1:Understand the characteristics of BJTs and FETs. CO2: Design and analyze BJT and FET amplifier circuits. CO3: Design sinusoidal and non-sinusoidal oscillators. CO4:.Understand the functioning of linear ICs. CO5: Design of Linear IC based circuits.
18EC43	Control Systems	CO1:.Develop the mathematical model of mechanical and electrical systems. CO2: Develop transfer function for a given control system using block diagram reduction techniques and signal flow graph method. CO3: Determine the time domain specification s for first an d second order systems. CO4:Deter mine the stability of a system in the time domain using Routh-Hurwitz criterion and Root-locus technique. CO5: Determine the s stability of a system in the frequency domain u sing Nyquist and bode plots. Question paper pattern.
18EC44	Engineering Statistics And Linear Algebra	CO1:Identify and associate Random Variables and Random Processes in Communication events. CO2: Analyze and model the Random events in typical communication events to extract quantitative statistical parameters. CO3:Analyze and model typical signal sets in terms of a basis function set of Amplitude, phase and frequency. CO4:Demonstrate by way of simulation or emulation the ease of analysis employing basis functions, statistical representation and Eigen values.
18EC45	Signals And Systems	CO1:Analyze the different types of signals and systems CO2: Determine the linearity, causality, time-invariance and stability properties of continuous and discrete time systems. CO3:Represent continuous and discrete systems in time and frequency domain using different transforms Test whether the system is stable.
18EC46	Microcontroller	CO1:Explain the difference between Microprocessors & Microcontrollers, Architecture of 8051 Microcontroller, Interfacing of 8051 to external memory and Instruction set of 8051.

		CO2: Write 8051 Assembly level programs using 8051 instruction set. CO3:Explain the Interrupt system, operation of Timers/Counters and Serial port of 8051. CO4:Write 8051 Assembly language program to generate timings and waveforms using 8051 timers, to send & receive serial data using 8051 serial port and to generate an external interrupt using a switch. CO5:Write 8051 Assembly language programs to generate square wave on 8051 I/O port pin using interrupt and C Programme to send & receive serial data using 8051 serial port. CO6:Interface simple switches, simple LEDs, ADC 0804, LCD and Stepper Motor to 8051 using 8051 I/O ports.
18ECL47	Microcontroller Laboratory	CO1:Write Assembly language programs in 8051 for solving simple problems that manipulate input data using different instructions of 8051. CO2:Interface different input and output devices to 8051 and control them using Assembly language programs. CO3:Interface the serial devices to 8051 and do the serial transfer using C programming.
18ECL48	Analog Circuits Laboratory	CO1:Design analog circuits using BJT/FETs and evaluate their performance characteristics. CO2:Design analog circuits using OPAMPs for different applications CO3:Simulate and analyze analog circuits that usesICs for different electronic applications
18MATDIP 41	Additional Mathematics – II	CO1: Solve systems of linear equations using matrix algebra. CO2: Apply the knowledge of numerical methods in modelling and solving engineering problems. CO3: Make use of analytical methods to solve higher order differential equations. CO4: Classify partial differential equations and solve them by exact methods. CO5: Apply elementary probability theory and solve related problems.
5^{TH} SEMESTER		
18ES51	Technological Innovation Management And Entrepreneurship	CO1: Understand the fundamental concepts of Management and Entrepreneurship and opportunities in order to setup a business CO2: Describe the functions of Managers, Entrepreneurs and their social responsibilities CO3:Understand the components in developing a business plan CO4:Awareness about various sources of funding and institutions supporting entrepreneurs
18EC52	Digital Signal Processing	CO1:Determine response of LTI systems using time domain and DFT techniques. CO2: Compute DFT of real and complex discrete time signals. CO3:Computation of DFT using FFT algorithms and linear filtering approach. CO4:Design and realize FIR and IIR digital filters. CO5:Understand the DSP processor architecture.

18EC53	Principles Of Communication System	CO1:Determine response of LTI systems using time domain and DFT techniques. CO2: Compute DFT of real and complex discrete time signals. CO3:Computation of DFT using FFT algorithms and linear filtering approach. CO4:Design and realize FIR and IIR digital filters. CO5:Understand the DSP processor architecture.
18EC54	Information Theory & Coding	CO1:Explain concept of Dependent & Independent Source, measure of information, Entropy, Rate of Information and Order of a source CO2: Represent the information using Shannon Encoding, Shannon Fano, Prefix and Huffman Encoding Algorithms CO3:Model the continuous and discrete communication channels using input, output and joint probabilities CO4:Determine a codeword comprising of the check bits computed using Linear Block codes, cyclic codes convolutional codes CO5:Design the encoding and decoding circuits for Linear Block codes, cyclic codes, convolutional codes, BCH and Golay codes.
18EC55	Electromagnetic Waves	CO1:Evaluate problems on electrostatic force, electric field due to point, linear, volume charges by applying conventional methods and charge in a volume. CO2:Apply Gauss law to evaluate Electric fields due to different charge distributions and Volume Charge distribution by using Divergence Theorem. CO3:Determine potential and energy with respect to point charge and capacitance using Laplace equation and Apply Biot-Savart's and Ampere's laws for evaluating Magnetic field for different current configurations CO4:Calculate magnetic force, potential energy and Magnetization with respect to magnetic materials and voltage induced in electric circuits. CO5:Apply Maxwell's equations for time varying fields, EM waves in free space and conductors and Evaluate power associated with EM waves using Poynting theorem
18ECL56	Verilog Hdl	CO1:Write Verilog programs in gate, dataflow (RTL), behavioral and switch modeling levels of Abstraction CO2: Design and verify the functionality of digital circuit/system using test benches. CO3: Identify the suitable Abstraction level for a particular digital design. CO4:Write the programs more effectively using Verilog tasks, functions and directives. CO5:Perform timing and delay Simulation. CO6:Interpret the various constructs in logic synthesis.
18ECL57	Digital Signal Processing Laboratory	CO1:Understand the concepts of analog to digital conversion of signals and frequency domain sampling of signals. CO2:Modeling of discrete time signals and systems and verification of its properties and results. CO3:Implementation of discrete computations using DSP processor and verify the results. CO4:Realize the digital filters using a simulation tool and analyze the response of the filter for an audio signal.

`18ECL58	HDL LAB	CO1:Write the Verilog/VHDL programs to simulate Combinational circuits in Dataflow, Behavioral and Gate Level Abstractions. CO2:Describe sequential circuits like flip flops and counters in Behavioral description and obtain simulation waveforms. CO3:Synthesize Combinational and Sequential circuits on programmable ICs and test the hardware. CO4:Interface the hardware to the programmable chips and obtain the required output
6TH SEMESTER		
18EC61	Digital Communications	CO1:Associate and apply the concepts of Bandpass sampling to well specified signals and channels. CO2:Analyze and compute performance parameters and transfer rates for low pass and bandpass symbol under ideal and corrupted non band limited channels. CO3:Test and validate symbol processing and performance parameters at the receiver under ideal and corrupted bandlimited channels. CO4: Demonstrate that bandpass signals subjected to corruption and distortion in a bandlimited channel can be processed at the receiver to meet specified performance criteria.
18EC62	Arm Microcontroller And Embedded Systems	CO1:Describe the architectural features and instructions of 32 bit microcontroller ARM Cortex M3. CO2:Apply the knowledge gained for Programming ARM Cortex M3 for different applications. CO3:Understand the basic hardware components and their selection method based on the characteristics and attributes of an embedded system. CO4:Develop the hardware software co-design and firmware design approaches. CO5:Explain the need of real time operating system for embedded system applications.
18EC63	Microwaves And Antennas	CO1:Describe the use and advantages of microwave transmission CO2:Analyze various parameters related to microwave transmission lines and waveguides CO3: Identify microwave devices for several applications CO4:Analyze various antenna parameters necessary for building a RF system CO5:Recommend various antenna configurations according to the applications.
18EC641	Operating System	CO1:Explain the goals, structure, operation and types of operating systems. CO2:Apply scheduling techniques to find performance factors. CO3:Explain organization of file systems and IOCS. CO4:Apply suitable techniques for contiguous and non-contiguous memory allocation CO5:Describe message passing, deadlock detection and prevention methods.

18EC661	Data Structures Using C++	CO1: To understand the basic concepts of C++, Data objects, Linear Lists and singly Linked List CO2: To understand the concepts of Arrays and Matrics, Stack, Queue and Hashing. CO3: To understand the concepts of Binary Trees, Priority Queues and Search Trees.
18ECL66	Embedded Systems Lab	CO1:Understand the instruction set of 32 bit microcontroller ARM Cortex M3, and the software tool required for programming in Assembly and C language. CO2: Develop assembly language programs using ARM Cortex M3 for different applications. CO3: Interface external devices and I/O with ARM Cortex M3. CO4: Develop C language programs and library functions for embedded system applications.
18ECL67	Computer Communication Networks Lab	CO1:Understand the concepts of networking thoroughly CO2: Identify the protocols and services of different layers. CO3:Distinguish the basic network configurations and standards associated with each network. CO4: Analyze the performance of the network
		7^{TH} SEMESTER
18EC732	Satellite Communication	CO1:Describe the satellite orbits and its trajectories with the definitions of parameters associated with it. CO2:Describe the electronic hardware systems associated with the satellite subsystem and earth station. CO3:Describe the various applications of satellite with the focus on national satellite system. CO4:Compute the satellite link parameters under various propagation conditions with the illustration of multiple access techniques.
18EC733	Digital Image Processing	CO1:Understand image formation and the role human visual system plays in perception of gray and color image data. CO2:Apply image processing techniques in both the spatial and frequency (Fourier) domains. CO3:Design and evaluate image analysis techniques CO4:Conduct independent study and analysis of Image Enhancement and restoration techniques
18EC743	Multimedia Communication	CO1:Understand basics of different multimedia networks and applications. CO2:Understand different compression techniques to compress audio and video CO3:Describe multimedia Communication across Networks. CO4:Analyse different media types to represent them in digital form CO5:Compress different types of text and images using different compression techniques.
		8th semester

18EC81	Wireless And Cellular Communication	CO1:Explain concepts of propagation mechanisms like Reflection, Diffraction, Scattering in wireless channels. CO2:Develop a scheme for idle mode, call set up, call progress handling and call tear down in a GSM cellular network CO3:Develop a scheme for idle mode, call set up, call progress handling and call tear down in a CDMA cellular network. CO4:Understand the Basic operations of Air interface in a LTE 4G system.
18EC821	Network Security	CO1:Explain network security services and mechanisms and explain security concepts. CO2:Understand the concept of Transport Level Security and Secure Socket Layer. CO3:Explain Security concerns in Internet Protocol security. CO4:Explain Intruders, Intrusion detection and Malicious Software. CO5:Describe Firewalls, Firewall Characteristics, Biasing and Configuration.
18EC822	Micro Electromechanical Systems	CO1:Appreciate the technologies related to Micro Electro Mechanical Systems CO2:Understand design and fabrication processes involved with MEMS devices. CO3:Analyze the MEMS devices and develop suitable mathematical models CO4:Know various application areas for MEMS device
18EC823	Radar Engineering	CO1:Understand the radar fundamentals and radar signals. CO2:ExplaintheworkingprincipleofpulseDopplerradars,theirapplicationsand limitations CO3:Describe the working of various radar transmitters and receivers. CO4:Analyze the range parameters of pulse radar system which affect the system performance.

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