



Department of Electronics and Telecommunication Engineering

Course Outcomes

Second Year: 2019 Course			
Course Code	Course Name	Course Outcomes	
Semester- I			
207005	Engineering Mathematics – III	C01	Solve higher order linear differential equation using approximate techniques for modeling and analyzing electrical circuits.
		C02	Solve problems related to Fourier transform, Z transform & applications to communication system & signal processing.
		C03	Obtain interpolating polynomial, numerically differentiate & integrate functions, numerical solution of differential equation using single step & multi-step iterative method used in modern scientific computing
		C04	Perform vector differentiation, analyze the vector field & apply to electromagnetic fields.
		C05	Perform vector integration, analyze the vector field & apply to electromagnetic fields.
		C06	Analyze conformal mapping, transformation & perform contour integration of complex function in the study of electrostatics & signal processing.
204181	Electronic Circuits	C01	Learn the physics, characteristics and parameters of MOSFET towards its application as amplifier.
		C02	Design MOSFET amplifiers, with and without feedback, & MOSFET oscillators, for given Specifications.
		C03	Analyze and assess the performance of linear and switching regulators, with their variants, towards applications in regulated power supplies
		C04	Explain internal schematic of Op-Amp and define its performance parameters.
		C05	Design, Build and test Op-amp based analog signal processing and conditioning circuits towards various real time applications.
		C06	Understand and compare the principles of various data conversion techniques and PLL with their applications
204182	Digital Circuits	C01	Identify and prevent various hazards and timing problems in a digital design
		C02	Use the basic logic gates and various reduction techniques of digital logic circuit.
		C03	Analyze, design and implement combinational logic circuits.
		C04	Analyze, design and implement sequential circuits
		C05	Differentiate between Mealy and Moore machines.
		C06	Analyze digital system design using PLD.

204183	Electrical Circuits	C01	Analyze the simple DC and AC circuit with circuit simplification techniques.
		C02	Formulate and analyze driven and source free RL and RC circuits.
		C03	Formulate & determine network parameters.
		C04	Explain construction, working and applications of DC Machines/ Single Phase & Three Phase AC Motors.
		C05	Explain construction, working and applications of special purpose motors & understand motors used in electrical vehicles.
		C06	Analyze and select a suitable motor for different application.
204184	Data Structures	C06	Solve mathematical problems using C programming language.
		C02	Implement sorting and searching algorithms and calculate their complexity.
		C03	Develop applications of stack and queue using array.
		C04	Demonstrate applicability of Linked List.
		C05	Demonstrate applicability of nonlinear data structures - Binary Tree with respect to its time complexity.
		C06	Apply the knowledge of graph for solving the problems of spanning tree and shortest path algorithm.
204185	Electronic Circuit Lab	C01	Design & Implement DC operating point, CS Amplifier, current series feedback amplifier and Regulated Power supply.
		C02	Design & Implement Linear application of Op-Amp such as Integrator, Instrumentation amplifier and measure Op-Amp Parameters.
		C03	Design & Implement on- Linear application of Op-Amp such as Square & Triangular wave generator, Schmitt trigger.
		C04	Simulate design of Oscillator, R-2R Ladder, 2 bit flash ADC & PLL Circuit.
204186	Digital Circuits Lab	C01	Verify four voltage and current parameters for TTL and CMOS.
		C02	Design and implement combinational logic circuit such as multiplexor, full adder and Subtract or, 1-digit BCD adder, magnitude comparator using IC.
		C03	Design and implement sequential logic circuit such as 4-bit counter, MOD-N and MOD-NN counter, 4-bit Up/down Counter, 4-bit shift register and Pulse train generator.
		C04	Simulate design of combinational and sequential circuits on given virtual lab link.
204187	Electrical Circuits Lab	C01	Implement the basic electrical circuits; verify the operations using circuit laws, theorems and parameters.
		C02	Explain construction, working and applications of AC Machine, DC Machine and special purpose motors
		C03	Analyze and select a suitable motor for different applications.

204188	Data Structures Lab	C01	Implement the linear data structures; and perform operations on them using C language.
		C02	Implement the non- linear data structures; and perform operations on them using C language.
		C03	Demonstrate the applicability of data structures.
204189	Electronic Skill Development	C01	Apply the basic concepts of Electronic components, sensors, actuators and interface with Ardiuno.
		C02	Draw layout, design PCB and get hands on experience of testing, measurement.
		C03	Demonstrate the assembly of electrical and electronics systems like batteries, motors and understand solar plant.
Semester- II			
204191	Signals and Systems	C01	Identify, classify basic signals and perform operations on signals.
		C02	Identify, Classify the systems based on their properties in terms of input output relation and in terms of impulse response and will be able to determine the convolution between to signals.
		C03	Analyze and resolve the signals in frequency domain using Fourier series and Fourier Transform.
		C04	Resolve the signals in complex frequency domain using Laplace Transform, and will be able to apply and analyze the LTI systems using Laplace Transforms.
		C05	Define and Describe the probability, random variables and random signals. Compute the probability of a given event, model, compute the CDF and PDF.
		C06	Compute the mean, mean square, variance and standard deviation for given random variables using PDF.
204192	Control Systems	C01	Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.
		C02	Analyze First Order and Second Order systems in the context of Time response analysis. Determine the (absolute) stability of a closed-loop control system.
		C03	Perform time domain analysis of control systems required for stability analysis. Apply root-locus technique to analyze control systems.
		C04	Apply Frequency domain technique to analyze control systems
		C05	Express and solve system equations in state variable form
		C06	Differentiate between various digital controllers and understand the role of the controllers in Industrial automation.
204193	Principles of Communication Systems	C01	To compute & compare the bandwidth and transmission power requirements by analyzing time and Frequency domain spectra of signal required for modulation schemes under study.
		C02	Describe and analyze the techniques of generation, transmission and reception of Amplitude Modulation Systems.

		C03	Explain generation and detection of FM systems and compare with AM systems.
		C04	Exhibit the importance of Sampling Theorem and correlate with Pulse Modulation technique (PAM, PWM, and PPM).
		C05	Characterize the quantization process and elaborate digital representation techniques (PCM, DPCM, DM and ADM).
		C06	Illustrate waveform coding, multiplexing and synchronization techniques and articulate their importance in baseband digital transmission.
204194	Object Oriented Programming	C01	Describe the principles of object oriented programming.
		C02	Apply the concepts of data encapsulation, inheritance in C++.
		C03	Understand Operator overloading and friend functions in C++.
		C04	Apply the concepts of classes, methods inheritance and polymorphism to write programs C++.
		C05	Apply Templates, Namespaces and Exception Handling concepts to write programs in C++
		C06	Describe and use of File handling in C++.
204196	Principles of Communication Systems Lab	C01	Demonstrate the working of amplitude and frequency modulation and analyze its behavior in terms of modulation index and bandwidth requirement.
		C02	Verify the sampling theorem and observe the effect of aliasing in sampling through simulation and hardware implementation.
		C03	Demonstrate the working of different blocks of digital communication systems and representation of its output in different data formats either through hardware implementation or a simulation software.
		C04	Simulate the communication systems to analyze its performance in presence of noise.
		C05	Apply Templates, Namespaces, and Exception Handling concepts to write programs in C++.
		C06	Describe the fundamentals of file handling in C++.
204195	Signals and Control System Lab	C01	Develop codes to generate, plot and simulate the various signals in time domain and also to perform their sampling.
		C02	Develop codes to perform Real time speech signal spectral analysis and to sketch response of the system.
		C03	Apply the fundamental rules to solve block diagrams and signal flow graphs and to compute the transfer function of Electric and Mechanical Circuits.
		C04	Analyze first order and second order systems using step input, Characteristic Equation and root locus for stability analysis.
		C05	Compute and analyze frequency response analysis using Bode plot and Nyquist Plot.
		C06	Computation of State Model from Transfer function.

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204197	Object Oriented Programming Lab	C01	Create simple programs using basic program constructs, classes, and objects in C++.
		C02	Implement the object oriented programming concepts in C++.
		C03	Implement object oriented programs using template, namespace, exception handling, and file handling.
204198	Data Analytics Lab	C01	Perform basic operations on data in Python.
		C02	Plot data for data visualization in Python.
		C03	Apply data wrangling techniques for data pre-processing, data cleaning, and data formatting.
		C04	Apply concept of statistical data analysis for solving DA problems in Python.
		C05	Apply concept of correlation, ANOVA for solving DA problems in Python.
		C06	Prepare a portfolio for given problem statement using suitable model for prediction or analysis.
204199	Employability Skill Development	C01	Define personal and career goals using introspective skills and SWOC assessment. Identify and estimate short-term and long-term goals.
		C02	Develop effective communication skills (listening, reading, writing, and speaking), self- management attributes, problem solving abilities and team working & building capabilities in order to fetch employment opportunities and further succeed in the workplace.
		C03	Understand a multi-cultural professional environment and work effectively by enhancing inter-personal relationships, conflict management and leadership skills.
		C04	Comprehend the importance of professional ethics, etiquettes & morals and demonstrate sensitivity towards it throughout certified career.
		C05	Develop practically deployable skill set involving critical thinking, effective presentations and leadership qualities to hone the opportunities of employability and excel in the professional environment.
		C06	Have skills and preparedness to solve the arithmetic and mathematical aptitude & logical reasoning.
204200	Project Based Learning	C01	Identify the real world problem through a rigorous literature survey and formulate/set relevant aim and objectives.
		C02	Contribute to society through proposed solution by following professional ethics and safety measures.

		C03	Design and implement the proposed solution to the identified problem.
		C04	Analyze the results and arrive at a valid conclusion.
		C05	Use suitable hardware and software tools to carry out the project implementation.
		C06	Demonstrate ability to work as an individual and as a team member, and document project work systematically.

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Third Year: 2019 Course			
Course Code	Course Name	Course Outcomes	
Semester- I			
304181	Digital Communication	C01	Apply the statistical theory for describing various signals in a communication system.
		C02	Understand and explain various digital modulation techniques used in digital communication systems
		C03	Understand performance in presence of AWGN noise
		C04	Describe and analyze the digital communication system with spread spectrum modulation.
		C05	Analyze a communication system using information theoretic approach.
		C06	Use error control coding techniques to improve performance of a digital communication system.
304182	Electromagnetic Field Theory	C01	Apply the basic electromagnetic principles and determine the fields (E & H) due to the given source
		C02	Apply boundary conditions to the boundaries between various media to interpret behavior of the fields on either sides
		C03	State, Identify and Apply Maxwell's equations (integral and differential forms) in both the forms (Static, time-varying or Time-harmonic field) for various sources, Calculate the time average power density using Pointing Theorem, Retarded magnetic vector potential.
		C04	Formulate, Interpret and solve simple uniform plane wave (Helmholtz Equations) equations, and analyze the incident/reflected/transmitted waves at normal incidence.
		C05	Interpret and Apply the transmission line equation to transmission line problems with load impedance to determine input and output voltage/current at any point on the Transmission line, Find input/load impedance, input/load admittance, reflection coefficient, SWR, V_{max}/V_{min} , length of transmission line using Smith Chart.
		C06	Carry out a detailed study; interpret the relevance and applications of Electromagnetics.
304183	Database Management	C01	Ability to implement the underlying concepts of a database system
		C02	Design and implement a database schema for a given problem-domain using data model.
		C03	Formulate, using SQL/DML/DDDL commands, solutions to a wide range of query and update problems.

		C04	Implement transactions, concurrency control, and be able to do Database recovery.
		C05	Able to understand various Parallel Database Architectures and its applications.
		C06	Able to understand various Distributed Databases and its applications
304184	Microcontrollers	C01	Understand the fundamentals of microcontroller and programming.
		C02	Interface various electronic components with microcontrollers.
		C03	Analyze the features of PIC 18F XXXX
		C04	Describe the programming details in peripheral support
		C05	Develop interfacing models according to applications.
		C06	Evaluate the serial communication details and interfaces
304185 (D)	Computer Networks (Elective -I)	C01	Design LAN using appropriate networking architecture, topologies, transmission media, and networking devices.
		C02	Understand the working of controlling techniques for flawless data communication using data link layer protocols.
		C03	Learn the functions of network layer, various switching techniques and internet protocol addressing
		C04	Explore various interior and exterior, unicasting and multicasting protocols
		C05	Analyze data flow using TCP/UDP Protocols, congestion control techniques for QoS.
		C06	Illustrate the use of protocols at application layer.
Semester- II			
304192	Cellular Networks	C01	Understand fundamentals of wireless communications
		C02	Discuss and study OFDM and MIMO concepts.
		C03	Elaborate fundamentals mobile communication
		C04	Describes aspects of wireless system planning.
		C05	Understand of modern and futuristic wireless networks architecture.
		C06	Summarize different issues in performance analysis.
304193	Project Management	C01	Apply the fundamental knowledge of project management for effectively handling the projects.
		C02	Identify and select the appropriate project based on feasibility study and undertake its effective planning.
		C03	Assimilate effectively within the organizational structure of project and handle project management related issues in an efficient manner.
		C04	Apply the project scheduling techniques to create a Project Schedule Plan and accordingly utilize the resources to meet the project deadline.
		C05	Identify and assess the project risks and manage finances in line with Project Financial Management Process.

		C06	Develop new products assessing their commercial viability and develop skillsets for becoming successful entrepreneurs while being fully aware of the legal issues related to Product development and Entrepreneurship.
304194	Power Devices & Circuits	C01	To differentiate based on the characteristic parameters among SCR, GTO, MOSFET & IGBT and identify suitability of the power device for certain applications and understand the significance of device ratings.
		C02	To design triggering / driver circuits for various power devices.
		C03	To evaluate and analyze various performance parameters of the different converters and its topologies.
		C04	To understand significance and design of various protections circuits for power devices.
		C05	To evaluate the performance of uninterruptible power supplies, switch mode power supplies and battery.
		C06	To understand case studies of power electronics in applications like electric vehicles, solar systems etc.
304195 (A)	Digital Image Processing (Elective -II)	C01	Apply knowledge of mathematics for image understanding and analysis
		C02	Implement spatial domain image operations
		C03	Design and realize various algorithms for image segmentation
		C04	Design and realize various algorithms for image Compression
		C05	Apply restoration to remove noise in the image
		C06	Describe the object recognition system

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Course Outcomes

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Semester- I			
404181	Radiation and Microwave Theory	C01	Apply the fundamentals of electromagnetic to derive free space propagation equation and distinguish various performance parameters of antenna.
		C02	Identify various modes in the waveguide. Compare: coaxial line, rectangular waveguides & striplines and identify applications of the same.
		C03	Explore construction and working of principles passive microwave devices/components.
		C04	Explore construction and working of principles active microwave devices/components
		C05	Analyze the structure, characteristics, operation, equivalent circuits and applications of various microwave solid state active devices.
		C06	Know the various microwave systems, device set ups of microwave measurement devices and Identify the effect of radiations on environmental sustainability.
404182	VLSI Design and Technology	C01	Develop effective HDL codes for digital design
		C02	Apply knowledge of real time issues in digital design.
		C03	Model digital circuit with HDL, simulate, synthesis and prototype in PLDs
		C04	Design CMOS circuits for specified applications
		C05	Analyze various issues and constraints in design of an ASIC.
		C06	Apply knowledge of testability in design and Build In Self-Test (BIST) circuit
404183	Cloud Computing	C01	Understand the basic concepts of Cloud Computing
		C02	Describe the underlying principles of different Cloud Service Models
		C03	Classify the types of Virtualization.
		C04	Examine the Cloud Architecture and understand the importance of Cloud Security.
		C05	Develop applications on Cloud Platforms.
		C06	Evaluate distributed computing and the Internet of Things.

404184 (E)	Modernized IoT (Elective - III)	C01	Comprehend and analyze concepts of sensors, actuators, IoT and IoE
		C02	Interpret IoT Architecture Design Aspects.
		C03	Comprehend the operation of IoT protocols
		C04	Describe various IoT boards, interfacing, and programming for IoT.
		C05	Illustrate the technologies, Catalysts, and precursors of IIoT using suitable use cases.
		C06	Provide suitable solution for domain specific applications of IoT.
404185 (A)	Data Mining (Elective - IV)	C01	Understand the process of data mining and performance issues in data mining
		C02	Apply data preprocessing techniques to the historical data collected in data warehouse
		C03	Analyze various types of Frequent pattern analysis methods and advanced Pattern mining techniques
		C04	Evaluate various data mining algorithms for developing effective data mining models
		C05	Analyze different clustering and outlier detection methods
		C06	Design data mining models in different mining application areas
Semester- II			
404190	Fiber Optic Communication	C01	Explain the working of components and measurement equipment's in optical fiber networks
		C02	Calculate the important parameters associated with optical components used in fiber optic telecommunication systems.
		C03	Compare and contrast the performance of major components in optical links.
		C04	Evaluate the performance viability of optical links using the power and rise time budget analysis.
		C05	Design digital optical link by proper selection of components and check its viability using simulation tools.
		C06	Compile technical information related to state of art components, standards, simulation tools and current technological trends by accessing the online resources to update their domain knowledge.
404191 (E)	Mobile Computing (Elective - V)	C01	Understand concepts of Mobile Communication.
		C02	Analyze next generation Mobile Communication System.
		C03	Understand network layers of Mobile Communication
		C04	Understand IP and Transport layers of Mobile Communication
		C05	Study of different mathematical models.
		C06	Understand different mobile applications.

404192 (D)	Digital Marketing (Elective - VI)	C01	Design websites using free tools like Word press and explore it for digital marketing.
		C02	Apply various keywords for a website & to perform SEO
		C03	Understand the various SEM Tools and implement the Digital Marketing Tools.
		C04	Illustrate the use of Facebook, Instagram and Youtube for Digital Marketing in real life
		C05	Use Linked in platform for various campaigning.
		C06	Understand the importance of recent trends in digital marketing
404193	Innovation and Entrepreneurship	C01	Understand Innovation, Entrepreneurship and characteristics of an entrepreneur.
		C02	Develop a strong understanding of the Design Process and its application in variety of business settings
		C03	Generate sustainable ideas
		C04	Explore various processes required to be an entrepreneur
		C05	Understand patents and its process of filing.
		C06	Choose and use appropriate social media for marketing.