

AMRUTVAHINI COLLEGE OF ENGINEERING, SANGAMNER
Department of Electronics and Telecommunication Engineering

Course Outcomes

Second Year: 2019 Course			
Course Code	Course Name	Course Outcomes	
Semester- I			
207005	Engineering Mathematics – III	CO1	Solve higher order linear differential equation using approximate techniques for modelling and analysing electrical circuits.
		CO2	Solve problems related to Fourier transform, Z transform & applications to communication system & signal processing.
		CO3	Obtain interpolating polynomial, numerically differentiate & integrate functions, numerical solution of differential equation using single step & multi-step iterative method used in modern scientific computing
		CO4	Perform vector differentiation, analyze the vector field & apply to electromagnetic fields.
		CO5	Perform vector integration, analyze the vector field & apply to electromagnetic fields.
		CO6	Analyze conformal mapping, transformation & perform contour integration of complex function in the study of electrostatics & signal processing.
204181	Electronic Circuits	CO1	Describe the operation of MOSFET and Analyze MOSFET circuits for evaluate the performance of voltage gain, Input Impedance, Output Impedance.
		CO2	Describe different applications of MOSET and Apply the concepts of positive and negative feedback for design of oscillator and Amplifier.
		CO3	Explore different types of voltage regulators and develop Adjustable regulated power supply using of LM317 & LM337
		CO4	Understand internal structure of op amp IC and op-amp parameters like input and output offset voltage, bias current, slew rate, common mode rejection ratio.
		CO5	Design and Analyze linear and nonlinear applications of Op-Amp, and verify its operation.
		CO6	Explain types of signal converter, their advantages, disadvantages and design of signal converter using op-amp and Understand the functionalities of PLL
204182	Digital Circuits	CO1	Understand types of digital logic family, its classification, characteristics and design examples of TTL and CMOS logic family.
		CO2	Understand various reduction techniques of logical functions, minimization of logical functions using K-Map, Use of logic gates for design of code converters.
		CO3	Analyze, design and implement combinational logic circuits.
		CO4	Analyze, design and implement sequential circuits.
		CO5	Differentiate between Mealy and Moore machines and understand examples of sequence detector circuits.
		CO6	Understand types of semiconductor memories and Analyze digital system design using programmable logic devices (PLD).
204184	Data Structures	CO1	Apply the knowledge of fundamentals in C to develop the programs for solving simple problems.
		CO2	Implement sorting and searching algorithms; and calculate their complexity.
		CO3	Describe the concepts of stacks and queues; and apply these for expression evaluation & conversion; and recursion.
		CO4	Describe the concepts of Linked List; and apply these for representation of stack, queue; and polynomial.
		CO5	Illustrate the terminologies, types, and traversals of binary trees.
		CO6	Illustrate the terminologies, types, and traversals of graphs; and apply the knowledge of graphs for solving the problems of spanning tree and shortest path algorithms.
204185	Electronic Circuit Lab	CO1	Design & Implement DC operating point, CS Amplifier, current series feedback amplifier and Regulated Power supply
		CO2	Design & Implement Linear application of Op-Amp such as Integrator, Instrumentation amplifier and measure Op-Amp Parameters

		CO3	Design & Implement Non- Linear application of Op-Amp such as Square & Triangular wave generator,schmitt trigger
		CO4	Simulate design of Oscillator,R-2R Ladder, 2 bit flash ADC & PLL Circuit.

204186	Digital Circuits Lab	CO1	Verify four voltage and current parameters for TTL and CMOS.
		CO2	Design and implement combinational logic circuit such as multiplexor, full adder and Subtractor, 1-digit BCD adder, magnitude comparator using IC.
		CO3	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.
		CO4	Simulate design of combinational and sequential circuits on given virtual lab link.
204187	Electrical Circuits Lab	CO1	Implement the basic electrical circuits, verify the operations using circuit laws, theorems and parameters.
		CO2	Explain construction, working and applications of AC Machine, DC Machine and special purpose motors
		CO3	Analyze and select a suitable motor for different applications.
204188	Data Structures Lab	CO1	Implement the linear data structures; and perform operations on them using C language.
		CO2	Implement the non- linear data structures; and perform operations on them using C language.
		CO3	Demonstrate the applicability of data structures.
204189	Electronic Skill Development	CO1	Apply the basic concepts of Electronic components, sensors, actuators and interface with Arduino.
		CO2	Draw layout, design PCB and get hands on experience of testing, measurement.
		CO3	Demonstrate the assembly of electrical and electronics systems like batteries, motors and understand solar plant.

Semester- II

204191	Signals and Systems	CO1	Develop the mathematical equations of continuous and discrete time signals and systems and perform fundamental specific as well as multiple operations on signals and Categorize signals and systems into different categories
		CO2	Predict the output of continuous and discrete time Linear Time Invariant (LTI) systems by applying convolution integral and convolution sum methods respectively.
		CO3	Apply Fourier series for continuous and discrete time signals and decompose into equivalent components.
		CO4	Apply Fourier transform and Laplace transform for appropriate signals and perform continuous time system analysis. Also understand the basics of discrete time Fourier transform.
		CO5	Apply the basic statistical concepts and develop the ability to find probability, CDF, PDF of a given event. Also understand correlation, energy spectral density and power spectral density.
		CO6	To solve the numericals by applying concepts of Signals and Systems individually and in group through discussion and interactions.
204192	Control Systems	CO1	Model Electrical, Translational and rotational mechanical systems for analysis.
		CO2	Analyze First Order and Second Order systems in the context of Time response analysis.
		CO3	Perform time domain analysis of control systems required for stability analysis. Apply root-locus technique to analyze control systems.
		CO4	Apply Frequency domain technique to analyze control systems
		CO5	Express and solve system equations in state variable form
		CO6	Differentiate between various digital controllers and understand the role of the controllers in Industrial automation.
204193	Principles of Communication Systems	CO1	Familiarize with basic mathematical tools for time and frequency domain analysis of communication signal and systems.
		CO2	Describe and analyze the techniques of generation, transmission and reception of amplitude modulation systems in time and frequency domain

		CO3	Explain generation and detection of FM systems and compare with AM systems in time and frequency domain.
		CO4	Exhibit the importance of sampling theorem and correlate with pulse modulation technique (PAM, PWM, and PPM).
		CO5	Characterize the quantization process and elaborate digital representation techniques (PCM, DPCM, DM and ADM).
		CO6	Illustrate waveform coding, multiplexing and synchronization techniques and articulate their importance in baseband digital transmission.
204194	Object Oriented Programming	CO1	Describe the basic concepts of object oriented programming; and apply the basic program construct in C++ to develop the programs for solving simple problems.
		CO2	Apply the concepts of classes, methods, and objects to write programs in C++.
		CO3	Apply the concepts of operator overloading and friend functions to write programs in C++.
		CO4	Apply the concepts of inheritance and polymorphism to write programs in C++.
204196	Principles of Communication Systems Lab	CO1	Demonstrate the working of amplitude and frequency modulation and analyze its behavior in terms of modulation index and bandwidth requirement.
		CO2	Verify the sampling theorem and observe the effect of aliasing in sampling through simulation and hardware implementation.
		CO3	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.
		CO4	Simulate the communication systems to analyze its performance in presence of noise.

		CO5	Apply Templates, Namespaces, and Exception Handling concepts to write programs in C++.
		CO6	Describe the fundamentals of file handling in C++.
204195	Signals and Control System Lab	CO1	Develop codes to generate, plot and simulate the various signals in time domain and also to perform their sampling.
		CO2	Develop codes to perform Real time speech signal spectral analysis and to sketch response of the system.
		CO3	Apply the fundamental rules to solve block diagrams and signal flow graphs and to compute the transfer function of Electric and Mechanical Circuits.
		CO4	Analyze first order and second order systems using step input, Characteristic Equation and root locus for stability analysis.
		CO5	Compute and analyze frequency response analysis using Bode plot and Nyquist Plot.
		CO6	Computation of State Model from Transfer function.
204196	Principles of Communication Systems Lab	CO1	Demonstrate the working of amplitude and frequency modulation and analyze its behaviour in terms of modulation index and bandwidth requirement.
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		CO3	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.
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204197	Object Oriented Programming Lab	CO1	Create simple programs using basic program constructs, classes, and objects in C++.
		CO2	Implement the object oriented programming concepts in C++.
		CO3	Implement object oriented programs using template, namespace, exception handling, and file handling.
204198	Data Analytics Lab	CO1	Perform basic operations on data in Python.
		CO2	Plot data for data visualization in Python.
		CO3	Apply data wrangling techniques for data pre-processing, data cleaning, and data formatting.
		CO4	Apply concept of statistical data analysis for solving DA problems in Python.
		CO5	Apply concept of correlation, ANOVA for solving DA problems in Python.
		CO6	Prepare a portfolio for given problem statement using suitable model for prediction or analysis.
204199	Employability Skill Development	CO1	Define personal and career goals using introspective skills and SWOC assessment. Identify and estimate short-term and long-term goals.
		CO2	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.
		CO3	Understand a multi-cultural professional environment and work effectively by enhancing inter-personal relationships, conflict management and leadership skills.
		CO4	Comprehend the importance of professional ethics, etiquettes & morals and demonstrate sensitivity towards it throughout certified career.
		CO5	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.
		CO6	Have skills and preparedness to solve the arithmetic and mathematical aptitude& logical reasoning.
204200	Project Based Learning	CO1	Identify the real world problem through a rigorous literature survey and formulate/set relevant aim and objectives.
		CO2	Contribute to society through proposed solution by following professional ethics and safety measures.

		CO3	Design and implement the proposed solution to the identified problem.
		CO4	Analyze the results and arrive at a valid conclusion.
		CO5	Use suitable hardware and software tools to carry out the project implementation.
		CO6	Demonstrate ability to work as an individual and as a team member, and document project work systematically.