CAYMET's

Siddhant College of Engineering

Savitribai Phule Pune University, Pune

Second Year Electronics & Telecommunication Engineering (2019 Course)

COURSE OBJECTIVE & OUTCOMES

SEM I

Subject Code &Name -207005 Engineering Mathematics - III

Program Outcome

1. To make the students familiarize with concepts and techniques in Ordinary differential equations, Fourier Transform, Z-Transform, Numerical methods, Vector calculus and functions of a Complex variable.
2. The aim is to equip them with the techniques to understand advanced level mathematics and its applications that would enhance analytical thinking power, useful in their disciplines.

Course Outcomes

On completion of the course, learner will be able to-

1. CO1: Solve higher order linear differential equation using appropriate techniques for modelling, analyzing of electrical circuits and control systems.
2. CO2: Apply concept of Fourier transform & Z-transform and its applications to continuous & discrete systems, signal & image processing and communication systems.
3. CO3: Obtain Interpolating polynomials, numerically differentiate and integrate functions, numerical solutions of differential equations using single step and multi-step iterative methods used in modern scientific computing.
4. CO4: Perform vector differentiation & integration, analyze the vector fields and apply to electro-magnetic fields & wave theory.
5. CO5: Analyze Complex functions, Conformal mappings, Contour integration applicable to electrostatics, digital filters, signal and image processing.

Subject Code &Name -204181-Electronic Circuits

Program Outcome

To make the students understand

1. Semiconductor device MOSFET, its characteristics, parameters & applications.
2. Concepts of feedbacks in amplifiers & oscillators.

3. Operational amplifier, concept, parameters & applications.
4. ADC, DAC as an interface between analog & digital domains.
5. Voltage to current and current to voltage converters.
6. Concepts, characteristics & applications of PLL.

Course Outcomes

On completion of the course, learner will be able to -

1. CO1: Assimilate the physics, characteristics and parameters of MOSFET towards its application as amplifier.
2. CO2: Design MOSFET amplifiers, with and without feedback, & MOSFET oscillators, for given specifications.
3. CO3: Analyze and assess the performance of linear and switching regulators, with their variants, towards applications in regulated power supplies.
4. CO4: Explain internal schematic of Op-Amp and define its performance parameters.
5. CO5: Design, Build and test Op-amp based analog signal processing and conditioning circuits towards various real time applications.
6. CO6: Understand and compare the principles of various data conversion techniques and PLL with their applications.

Subject Code &Name -<u>204182-Digital Circuits</u>

Program Outcome:

1. To make the students understand
2. The fundamental principles of two-valued logic and various devices used to implement logical operations on variables.
3. Boolean algebra, Karnaugh maps and its application to the design and characterization of digital circuits.
4. To analyze logic processes and implement logical operations using combinational logic circuits.
5. The principles of logic design and use of simple memory devices, flip-flops, and sequential circuits.
6. Concepts of sequential circuits and to analyze sequential systems in terms of state machines.
7. System design approach using programmable logic devices.

Course Outcomes: On completion of the course, learner will be able to -

1. CO1: Identify and prevent various hazards and timing problems in a digital design.
2. CO2: Use the basic logic gates and various reduction techniques of digital logic circuit.
3. CO3: Analyze, design and implement combinational logic circuits.
4. CO4: Analyze, design and implement sequential circuits.

5. CO5: Differentiate between Mealy and Moore machines.
6. CO6: Analyze digital system design using PLD.

Subject Code &Name – 204183-Electrical Circuits

Program Outcome:

1. To analyze simple DC and AC circuits with circuit simplification techniques.
2. To formulate and analyze driven and source free RL and RC circuits.
3. To formulate & determine network parameters for given network.
4. To understand the constructional details, characteristics, features and application areas of various types of electric motors.

Course Outcomes: On completion of the course, learner will be able to -

1. CO1: Analyze the simple DC and AC circuit with circuit simplification techniques.
2. CO2: Formulate and analyze driven and source free RL and RC circuits.
3. CO3: Formulate & determine network parameters for given network and analyze the given network using Laplace Transform to find the network transfer function.
4. CO4: Explain construction, working and applications of DC Machines / Single Phase & Three Phase AC Motors.
5. CO5: Explain construction, working and applications of special purpose motors & understand motors used in electrical vehicles.
6. CO6: Analyze and select a suitable motor for different applications.

Subject Code &Name -204184-Data Structures

Program Outcome:

1. To learn basic concepts of C Programming language.
2. To learn different sorting and searching algorithms and their analysis.
3. To learn linear data structures: Stack and Queue, Linked List and their applications.
4. To learn nonlinear data structures: Tree, Graph and their applications.
5. To study the systematic ways of solving problem, various methods of organizing large amount of data.
6. To solve problems using data structures such as binary tree, binary search tree, and graph and writing programs.

Course Outcomes: On completion of the course, learner will be able to -

1. CO1: Solve mathematical problems using C programming language.
2. CO2: Implement sorting and searching algorithms and calculate their complexity.

3. CO3: Develop applications of stack and queue using array.
4. CO4: Demonstrate applicability of Linked List.
5. CO5: Demonstrate applicability of nonlinear data structures - Binary Tree with respect to its time complexity.
6. CO6: Apply the knowledge of graph for solving the problems of spanning tree and shortest path algorithm

SEM II

Subject Code &Name -<u>204184-Signals & Systems</u>

Program Outcome

1. To understand the mathematical representation of continuous and discrete time signals and systems.
2. To classify signals and systems into different categories.
3. To analyze Linear Time Invariant (LTI) systems in time and transform domains.
4. To build basics for understanding of courses such as signal processing, control system and communication.
5. To develop basis of probability and random variables.

Course Outcomes

On completion of the course, learner will be able to -

1. CO1: Identify, classify basic signals and perform operations on signals.
2. CO2: 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.
3. CO3: Analyze and resolve the signals in frequency domain using Fourier series and Fourier Transform.
4. CO4: Resolve the signals in complex frequency domain using Laplace Transform, and will be able to apply and analyze the LTI systems using Laplace Transforms.
5. CO5: Define and describe the probability, random variables and random signals. Compute the probability of a given event, model, compute the CDF and PDF.
6. CO6: Compute the mean, mean square, variance and standard deviation for given random variables using PDF.

Subject Code &Name -<u>204192-Control Systems</u>

Program Outcome

1. To Introduce elements of control system and their modeling using various Techniques.
2. To get acquainted with the methods for analyzing the time response and Stability of System
3. To Introduce and analyze the frequency response and Stability of System
4. To Introduce concept of root locus, Bode plots, Nyquist plots.
5. To Introduce State Variable Analysis method.
6. To get acquainted with Concepts of PID controllers and IoT based Industrial Automation.

Course Outcomes

On completion of the course, learner will be able to -

1. CO1: Determine and use models of physical systems in forms suitable for use in the analysis and design of control systems.
2. CO2: Determine the (absolute) stability of a closed-loop control system.
3. CO3: Perform time domain analysis of control systems required for stability analysis.
4. CO4: Perform frequency domain analysis of control systems required for stability analysis.
5. CO5: Apply root-locus, Frequency Plots technique to analyze control systems.
6. CO6: Express and solve system equations in state variable form.
7. CO7: Differentiate between various digital controllers and understand the role of the controllers in Industrial automation

Subject Code &Name -<u>204193-Principles of Communication Systems</u>

Program Outcome

1. To equip/ familiarize students with basic mathematical tools for time and frequency domain analysis of communication signal and systems.
2. To acquaint the students with the fundamental principles of modulation process and different amplitude and angle modulation systems.
3. To introduce the students with the concept of Sampling theorem and pulse modulation techniques PAM, PWM, PPM.
4. To impart pre-requisites of digital communication systems and explore digital representation techniques like PCM, DPCM, DM and ADM.
5. To highlight the issues in baseband digital transmission such as data representation, synchronization, multiplexing and ISI.

Course Outcomes

On completion of the course, learner will be able to -

1. CO1: To compute & compare the bandwidth and transmission power requirements by analyzing time and frequency domain spectra of signal required for modulation schemes under study.
2. CO2: Describe and analyze the techniques of generation, transmission and reception of Amplitude Modulation Systems.
3. CO3: Explain generation and detection of FM systems and compare with AM systems.
4. CO4: Exhibit the importance of Sampling Theorem and correlate with Pulse Modulation technique (PAM, PWM, and PPM).
5. CO5: Characterize the quantization process and elaborate digital representation techniques (PCM, DPCM, DM and ADM).

6. CO6: Illustrate waveform coding, multiplexing and synchronization techniques and articulate their importance in baseband digital transmission.

Subject Code & Name -<u>204194-Object Oriented Programming</u>
Program Outcome

1. Make the students familiar with basic concepts and techniques of object oriented programming in C++ to acquaint the students with the fundamental principles of modulation process and different amplitude and angle modulation systems.
2. Develop an ability to write programs in C++ for problem solving.

Course Outcomes

On completion of the course, learner will be able to -

1. CO1: Describe the principles of object oriented programming.
2. CO2: Apply the concepts of data encapsulation, inheritance in C++.
3. CO3: Understand Operator overloading and friend functions in C++.
4. CO4: Apply the concepts of classes, methods inheritance and polymorphism to write programs C++.
5. CO5: Apply Templates, Namespaces and Exception Handling concepts to write programs in C++.
6. CO6: Describe and use of File handling in C++.

Subject Code &Name -<u>204199- Employability Skills Development</u>

Program Outcome

1. Develop good communication skills – both oral as well as written.
2. Encourage creative and critical thinking among students.
3. Nurture collaborative behavior to work efficiently in groups.

Course Outcomes

On completion of the course, learner will be able to -

1. CO1: Define personal and career goals using introspective skills and SWOC assessment. Outline and evaluate short-term and long-term goals.
2. 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.
3. CO3: Be a part of a multi-cultural professional environment and work effectively by enhancing inter-personal relationships, conflict management and leadership skills.
4. CO4: Comprehend the importance of professional ethics, etiquettes & morals and demonstrate sensitivity towards it throughout certified career.

5. 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.

Subject Code &Name -<u>204200-Project Based Learning Teaching</u>

Program Outcome

On completion of the course, learner will be able to -

1. To emphasize project based learning activities that are long-term, interdisciplinary and student-centric.
2. To inculcate independent and group learning by solving real world problem with the help of available resources. To be able to develop application based on the fundamentals of electronics and communication engineering by possibly the integration of previously acquired knowledge.
3. To get practical experience in all steps in the life cycle of the development of electronic systems: specification, design, implementation, and testing.
4. To be able to select and utilize appropriate hardware and software tools to design and analyze the proposed system.
5. To provide every student the opportunity to get involved either individually or as a group so as to develop team skills and learn professionalism.

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