

CAYMET's

Siddhant College of Engineering

Savitribai Phule Pune University, Pune

Third Year Electronics & Telecommunication (2019 Course)

COURSE OBJECTIVE & OUTCOMES

SEM I

Subject Code & Name - 304181: Digital Communication

Course Objectives

To make the students understand

1. To familiarize students with various digital modulation techniques used in digital communication systems.
2. To equip students with tools required for performance analysis of digital communication systems.
3. To introduce the students with the concept of information theory & coding techniques.

Course Outcomes

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

1. Apply the statistical theory for describing various signals in a communication system.
2. Understand and explain various digital modulation techniques used in digital communication systems and analyze their performance in presence of AWGN noise.
3. Describe and analyze the digital communication system with spread spectrum modulation.
4. Analyze a communication system using information theoretic approach.
5. Use error control coding techniques to improve performance of a digital communication system.

Subject Code & Name - 304182: Electromagnetic Field Theory

Course Objectives

1. Provide the foundation and rudiments of Electromagnetic theory essential to subsequent courses of radiation, microwave and wireless communications.
2. Expose the students to basic laws of electro statics, magneto statics leading to the Maxwell Equations for static and dynamic fields.
3. Extend these laws to Uniform Plane waves, transmission line theory and some of the case studies of applications of engineering electromagnetic field theory.
4. The main focus will be on the physical interpretation of all the mathematical formulations and extend these concepts to real time applications in the field Electronics and Telecommunication Engineering.

Course Outcomes

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

1. Apply the basic electromagnetic principles and determine the fields (E & H) due to the given source.
2. Apply boundary conditions to the boundaries between various media to interpret behavior of the fields on either sides.
3. 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 Poynting Theorem, Retarded magnetic vector potential.
4. Formulate, Interpret and solve simple uniform plane wave (Helmholtz Equations) equations, and analyze the incident/reflected/transmitted waves at normal incidence.
5. 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.

6. Carry out a detailed study, interpret the relevance and applications of Electromagnetics

Subject Code &Name - 304183: Database Management

Course Objectives

1. To understand fundamental concepts of database from its design to its implementation.
2. To analyze database requirements and determine the entities involved in the system and with one another.
3. To manipulate database using SQL Query to create, update and manage Database.
4. Be familiar with the basic issues of transaction processing and concurrency control.
5. To learn and understand Parallel Databases and its Architectures.
6. To learn and understand Distributed Databases and its applications.

Course Outcomes

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

1. Ability to implement the underlying concepts of a database system.
2. Design and implement a database schema for a given problem-domain using data model.
3. Formulate, using SQL/DML/DDDL commands, solutions to a wide range of query and update problems.
4. Implement transactions, concurrency control, and be able to do Database recovery.
5. Able to understand various Parallel Database Architectures and its applications.
6. Able to understand various Distributed Databases and its applications

Subject Code &Name - 304184: Microcontroller

Course Objectives

During the course study students will be able to

1. Understand architecture and features of 8051 and PIC18FXX Microcontroller.
2. Learn interfacing of real-world peripheral devices with microcontroller.
3. Explore different features of PIC 18F Microcontroller with Architecture.
4. Use concepts of timers and interrupts of PIC 18 in programming.
5. Design and develop microcontroller based embedded application.
6. Demonstrate real life applications using PIC 18.

Course Outcomes

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

1. Understand the fundamentals of microcontroller and programming.
2. Interface various electronic components with microcontrollers.
3. Analyze the features of PIC 18F XXXX.
4. Describe the programming details in peripheral support.
5. Develop interfacing models according to applications.
6. Evaluate the serial communication details and interfaces.

Subject Code &Name - 304185 (A): Digital Signal Processing (Elective -I)

Course Objectives

1. Understand the sampling, aliasing and block schematic of digital signal processing.
2. Introduction of transforms for analysis of systems using Z transform.
3. Introduction of DFT, FFT, DCT transforms for analysis of DT signals.
4. Design and implementation of IIR digital filters.
5. Design and implementation of FIR digital filters.
6. Apply DSP algorithms/techniques.

Course Outcomes

On completion of the course, student will be able to –

1. Interpret and process discrete/ digital signals and represent DSP system.

2. Analyze the digital systems using the Z-transform techniques.
3. Implement efficient transform and its application to analyze DT signals.
4. Design and implement IIR filters.
5. Design and implement FIR filters.
6. Apply DSP techniques for speech/ biomedical/ image signal processing.

Subject Code &Name - 304185 (B): Electronic Measurements (Elective –I)

Course Objectives

To make the students understand

1. Fundamental principles of measurement systems.
2. Basic electronics measuring instruments and analyzers.
3. Use of different types of Signal Generators.
4. Working principle and use of different types of Oscilloscopes.
5. Use of other display devices, recorders and timer/counter.
6. Advanced measurement systems.

Course Outcomes

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

1. Understand the metrics for the measurement system
2. Select and use the instruments for measurement & analysis of basic electronic parameters
3. Identify and use the different signal generators for specific applications
4. Understand the principles of different Oscilloscopes for specific applications
5. Identify the use of other display devices, recorders and timer/counter in measurement systems
6. Use the advanced measurement systems for electronics parameter measurement

Subject Code &Name - 304185 (C): Fundamentals of JAVA Programming (Elective -I)

Course Objectives

1. Make the students familiar with basic concepts and techniques of object oriented programming in Java.
2. Develop an ability to write various programs in Java for problem solving.

Course Outcomes

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

1. Understand the basic principles of Java programming language
2. Apply the concepts of classes and objects to write programs in Java
3. Demonstrate the concepts of methods & Inheritance
4. Use the concepts of interfaces & packages for program implementation
5. Understand multithreading and Exception handling in Java to develop robust programs
6. Use Graphics class, AWT packages and manage input and output files in Java

Subject Code &Name - 304185 (D): Computer Networks (Elective -I)

Course Objectives

1. To understand the concepts of networking, its standards and protocols.
2. To learn controlling techniques in networking at different layers.
3. To learn protocols at different layers of reference model.
4. To understand routing and networking in inter and intra domain.
5. To learn network programming.
6. To understand applications, protocols and its implication in networks.

Course Outcomes

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

1. Design LAN using appropriate networking architecture, topologies, transmission media, and networking devices.
2. Understand the working of controlling techniques for flawless data communication using data link layer protocols.

3. Learn the functions of network layer, various switching techniques and internet protocol addressing.
4. Explore various interior and exterior, unicasting and multicasting protocols.
5. Analyze data flow using TCP/UDP Protocols, congestion control techniques for QoS.
6. Illustrate the use of protocols at application layer.

Subject Code & Name - 304190: Skill Development

Course Objectives

1. To build and upgrade practical knowledge of an individual.
2. To make students employable with required skill set.
3. To promote youth work to assist "Make in India" initiative.
4. To grow and build confidence among students on specific skill sets.
5. To cultivate Entrepreneur mindset after getting required experience.
6. To improve professional skills such as moral/ethics/team work/communication skill/lifelong learning etc.

Course Outcome

After successfully completing the course,

1. Student should recognize the need to engage in independent and life-long learning in required **skill** sets
2. Student needs to experience the impact of industries on society by visiting different industries and understand the importance of industrial products for analog and digital circuits and systems.
3. Student has to make use of the modern electronic and IT Engineering Tools and Technologies for solving electronic engineering problems.
4. Student would be able to communicate effectively at different technical and administrative levels.
5. Student will exhibit leadership skills both as an individual and as a member in a team in multidisciplinary environment.

SEM-II

Subject Code &Name - 304192: Cellular Networks

Course Objectives

To make the students understand

1. Various propagation Model and Estimation techniques of wireless communication system.
2. OFDM and MIMO technologies to explain modern wireless systems.
3. Various aspects of mobile communication system.
4. Various aspects of wireless-system planning.
5. Different Generation of Mobile Networks.
6. Diversified issues that can enhance Network Performance.

Course Outcomes

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

1. Understand fundamentals of wireless communications.
2. Discuss and study OFDM and MIMO concepts.
3. Elaborate fundamentals mobile communication.
4. Describes aspects of wireless system planning.
5. Understand of modern and futuristic wireless networks architecture.
6. Summarize different issues in performance

Subject Code &Name - 304193: Project Management

Course Objectives

To make the students understand

1. The basics of project management and its life cycle
2. The process of project identification, selection criteria of the project and how the project planning is undertaken.
3. The organizational structure within a project and issues related to project management
4. The techniques for effective project scheduling and resource considerations in project.
5. The basics of effective handling the risks as well as managing finances within the project
6. The complete product development process and requirements for entrepreneurship along with related legal issues.

Course Outcomes

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

1. Apply the fundamental knowledge of project management for effectively handling the projects.
2. Identify and select the appropriate project based on feasibility study and undertake its effective planning.
3. Assimilate effectively within the organizational structure of project and handle project management related issues in an efficient manner.
4. Apply the project scheduling techniques to create a Project Schedule Plan and accordingly utilize the resources to meet the project deadline.
5. Identify and assess the project risks and manage finances in line with Project Financial Management Process.
6. 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

Subject Code &Name - 304194: Power Devices & Circuits

Course Objectives

1. To introduce different power devices viz. SCR, GTO, MOSFET and IGBT with construction, characteristics, repetitive and non repetitive ratings and typical triggering/driver circuits.
2. To understand working, design and performance analysis and applications of various power converter circuits such as ac to dc converters, inverter and chopper

3. To know various protection circuit requirements of power electronic devices.

Course Outcomes

On completion of the course, learner will be able –

1. 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.
2. To design triggering / driver circuits for various power devices.
3. To evaluate and analyze various performance parameters of the different converters and its topologies.
4. To understand significance and design of various protection circuits for power devices.
5. To evaluate the performance of uninterruptible power supplies, switch mode power supplies and battery.
6. To understand case studies of power electronics in applications like electric vehicles, solar systems etc.

Subject Code & Name -304195 (A): Digital Image Processing (Elective -II)

Course Objectives

1. To become familiar with digital image fundamentals.
2. To get exposed to simple image enhancement techniques in Spatial and Frequency domain.
3. To study the image segmentation and representation techniques.
4. To become familiar with image compression methods.
5. To learn concepts of degradation function and restoration techniques.
6. To understand the Object Recognition.

Course Outcomes

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

1. Apply knowledge of mathematics for image understanding and analysis.
2. Implement spatial domain image operations.
3. Design and realize various algorithms for image segmentation.
4. Design and realize various algorithms for image Compression.
5. Apply restoration to remove noise in the image.
6. Describe the object recognition system.

Subject Code & Name -304195 (B): Sensors in Automation (Elective -II)

Course Objectives

To make the students understand about:

1. Concept of Sensors/Transducers and their Static and Dynamic Characteristics.
2. Sensors used in Industry for Temperature and Humidity Measurement.
3. Sensors used for Force, Pressure, Stress and Flow measurements.
4. Sensors used for Displacement and Level Measurement.
5. Applications of Image and Biosensors.
6. Role of Sensors/Transducers in IoT applications.

Course Outcomes

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

1. Understand the Concepts of Sensors/Transducers, classify and evaluate static and Dynamic Characteristics of Measurement Systems.
2. Choose the proper sensor comparing different standards and guidelines for measurements of Temperature and Humidity.
3. Choose the proper sensor comparing different standards and guidelines for measurements of Force, Pressure, Stress and Flow
4. Choose the proper sensor comparing different standards and guidelines for measurements of Displacement, Vibration, Acceleration and Level

5. Explore sensors to profound areas like environmental, Agricultural and bio-medical equipment and sustainability.
6. Explore IoT based applications of Sensors and Transducer

Subject Code &Name-304195 (C): Advanced JAVA Programming (Elective -II)

Course Objectives

Make the learner to:

1. Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
2. Design and develop Web applications
3. Designing Enterprise based applications by encapsulating an application's business logic.
4. Designing applications using pre-built frameworks.

Course Outcomes

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

1. Design and develop GUI applications using Applets.
2. Apply relevant AWT/ swing components to handle the given event.
3. Design and develop GUI applications using Abstract Windowing Toolkit (AWT), Swing and Event Handling.
4. Learn to access database through Java programs, using Java Database Connectivity (JDBC)
5. Invoke the remote methods in an application using Remote Method Invocation (RMI)
6. Develop program for client /server communication using Java Networking classes.

Subject Code &Name -304195 (D): Embedded Processors(Elective -II)

Course Objectives

1. To make the **students** aware of the need of Embedded C and programming in Embedded C.
2. To get the students acquainted with the need and applications of ARM Microprocessors in Embedded systems. • To get insight of architecture and features of ARM 7 and ARM CORTEX M4 microcontroller.
3. To enhance the capabilities of students to interface of various I/O devices, sensors and communication devices.

Course Outcomes

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

1. Understand basics of Embedded C Programming and usage of Embedded C and study different software tools for programming microcontrollers.
2. Get acquainted with various Embedded Processor architectures related to industrial application.
3. Know about the programming of ARM 7 based microcontroller with on chip peripherals and external peripherals.
4. Understand the architectures of ARM Cortex M4 Microcontrollers and its advantages over ARM 7 Microcontrollers.
5. Implement the real world programming of ARM 7 based microcontroller with on chip peripherals and external peripherals.
6. Recognize the interfacing of real world sensors and standard buses. Will also able to design different case studies

Subject Code &Name - 304195 (E): Network Security (Elective-II)

Course Objectives

To introduce various network models, security threats and attacks and fundamentals of network security.

1. To imbibe good foundation of network security in students for implementation of new network security algorithms.
2. To understand different network models and the protocols used in each layer.
3. To acquire detailed approach of encryption decryption for the data to transmit.
4. To understand the role of network security as a tool for protection of different network entities.

5. To be able to accurately apply security algorithms to real world security issues.
6. To ensure windows and web browser security through implementation of various encryption standards.

Course Outcomes

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

1. Analyze attacks on computers and computer security.
2. Demonstrate knowledge of cryptography techniques.
3. Illustrate various Symmetric and Asymmetric keys for Ciphers
4. Evaluate different Message Authentication Algorithms and Hash Functions
5. Get acquainted with various aspects of E-Mail Security
6. Assimilate various aspects of Web Security

Subject Code &Name- 304199: Internship

Course Objective

1. Will expose technical students to the industrial environment, which cannot be simulated in the classroom and hence creating competent professionals for the industry.
2. Provide possible opportunities to learn, understand and sharpen the real time technical / managerial skills required at the job.
3. Exposure to the current technological developments relevant to the subject area of training.
4. Experience gained from the 'Internship' will be used in classroom discussions.
5. Create conditions conducive to quest for knowledge and its applicability on the job.
6. Learn to apply the Technical knowledge in real industrial situations.
7. Gain experience in writing Technical reports/projects.
8. Expose students to the engineer's responsibilities and ethics.
9. Familiarize with various materials, processes, products and their applications along with relevant aspects of quality control.
10. Promote academic, professional and/or personal development.
11. Expose the students to future employers.
12. Understand the social, economic and administrative considerations that influence the working environment of industrial organizations.
13. Understand the psychology of the workers and their habits, attitudes and approach to problem solving.

Course Outcomes

On completion of the internship, learner will be able to –

1. To develop professional competence through internship.
2. To apply academic knowledge in a personal and professional environment.
3. To build the professional network and expose students to future employees.
4. Apply professional and societal ethics in their day to day life.
5. To become a responsible professional having social, economic and administrative considerations.
6. To make own career goals and personal aspirations.

Subject Code &Name -304200: Mini Project

Course Objectives

1. To understand the —Product Development Process" including budgeting through Mini Project.
2. To plan for various activities of the project and distribute the work amongst team members.
3. To inculcate electronic hardware implementation skills by –
4. Learning PCB artwork design using an appropriate EDA tool.
5. Imbibing good soldering and effective trouble-shooting practices. • Following correct grounding and shielding practices.
6. To develop student's abilities to transmit technical information clearly and test the same by delivery of Seminar based on the Mini Project.

7. To understand the importance of document design by compiling Technical Report on the Mini Project work carried out.

Course Outcome

On completion of the course, student will be able to

1. Understand, plan and execute a Mini Project with team.
2. Implement electronic hardware by learning PCB artwork design, soldering techniques, testing and troubleshooting etc.
3. Prepare a technical report based on the Mini project.
4. Deliver technical seminar based on the Mini Project work carried out.
