BHARATI VIDYAPEETH'S
COLLEGE OF ENGINEERING, KOLHAPUR

Name of Department: Electronics and Telecommunication Engineering Sem:-III

Class: -Second Year B. TECH

Course: - PCC-ETC0233-Analog and Digital Communication

Course Outcomes:

1. Understand the fundamental concepts of AM Transmitters and receiver in analog communication systems
2. Understand the fundamental concepts of FM Transmitters and Receivers in analog communication systems.
3. Differentiate between various pulse modulation techniques.
4. Solve the problem based on information theory in communication System.
5. Classify different source coding & line coding techniques.
6. Compare different digital modulation technique and distortion in baseband transmission of digital signal.

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Name of Department: Electronics and Telecommunication Engineering
Class: -Second Year B. TECH Sem:-III
Course: - HSSM-ETC0237 Universal Human Values

Course Outcomes:

1. Become more aware of themselves, and their surroundings (family, society and nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
2. Become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
3. Apply what they have learnt to their own self in different day-to-day settings in real life, at least a beginning would be made in this direction.
4. Positively impact common graduate attributes like:
    1. Holistic vision of life
    2. Socially responsible behavior
    3. Environmentally responsible work
    4. Ethical human conduct
    5. Having Competence and Capabilities for Maintaining Health and Hygiene
    6. Appreciation and aspiration for excellence (merit) and gratitude for all

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Name of Department: Electronics and Telecommunication

Class: -Second Year B. TECH Sem:-III

Course: - ETC-MNR0211: Electronics Systems

Course Outcomes:

1. Explain the fundamental principles of electronic components and semiconductor physics.
2. Describe the working of transistors and operational amplifiers in analog electronic circuits.
3. Interpret digital logic circuits and their applications in various systems.
4. Summarize the characteristics of signals and their role in communication systems.
5. Classify different power electronic converters and illustrate their applications in control systems.
6. Discuss the basics of embedded systems and recognize advancements in emerging electronic

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Name of Department: Electronics and Telecommunication Engineering

Class: -Second Year B. TECH Sem:-III

Course: - PCC-ETC0232 ANALOG CIRCUIT DESIGN

Course Outcomes:

1. Analyze & Design Different types of filters & Voltage Regulators
2. Analyze & Design Different types of linear & nonlinear wave shaping circuits
3. Analyze a small signal voltage amplifier.
4. Analyze & Design Single & Multistage RC coupled amplifier Know different types of feedback topologies
5. Analyze & Design Different types of Oscillators
6. Analyze & Design Different types of Multivibrators

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Name of Department: Electronics and Telecommunication Engineering

Class: -Second Year B. TECH Sem:-III

Course: - HSSM-ETC0246: Employability Enhancement Skill

Course Outcomes:

1. Self-Reflection and SWOC Analysis: Students will be able to conduct selfreflection and perform a SWOC analysis to assess their strengths, weaknesses, opportunities, and challenges for personal and professional growth.
2. Effective Communication: Students will develop the ability to communicate clearly and effectively in verbal, written, and non-verbal forms across various platforms and overcome communication barriers.
3. Professional Writing Proficiency: Students will be able to write professional documents, including resumes, emails, and reports, with clarity and effectiveness, following industry standards.
4. Leadership and Teamwork: Students will demonstrate an understanding of leadership qualities and team dynamics and will be able to collaborate effectively in group settings and manage team-based projects.
5. Professional Ethics and Interview Skills: Students will apply professional ethics and etiquette in interviews, group discussions, and workplace interactions, ensuring proper conduct and communication.
6. Problem-Solving and Analytical Skills: Students will be able to solve quantitative and logical problems effectively and apply critical thinking strategies to tackle real-world challenges

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Name of Department: Electronics and Telecommunication

Class: -Second Year B. TECH Sem:-III

Course: - HSSM- ETC0239 Soft Skill Development

Course Outcomes:

1. Demonstrate effective communication through verbal/written communication and improved listening skill.
2. Exhibit effective communication in group discussion/meetings/interviews, prepare & presentations.
3. Demonstrate effective communication in multi-disciplinary and heterogeneous teams through the knowledge of team work, inter-personal relationships, conflict management and leadership quality.
4. Write precise briefs or reports and technical documents.

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Name of Department: Electronics and Telecommunication

Class: -Second Year B. TECH Sem:-III

Course: - PCC-ETC-0231 Network Analysis

Course Outcomes:

1. Explain the graph theory and solve problems related to graph theory and different basic laws and network theorems.
2. Demonstrate two port networks and significance of its parameters.
3. Analyse and design prototype LC filters.
4. Explain series and parallel resonance and address problems related to resonance.
5. Identify and study types of transient responses.

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Name of Department: Electronics and Telecommunication

Class: -Second Year B. TECH Sem:-III

Course: - PCC-ETC 0210: Mathematics for Electronics Engineering

Course Outcomes:

1. Make use of Linear Differential Equations to solve the Electronics Engineering problems.
2. Develop Fourier series expansion of a function over the given interval.
3. Apply knowledge of vector differentiation to find directional derivatives, curl and divergence of vector fields.
4. Solve problems involving the Normal, Poisson and Binomial distributions in probability theory
5. Find Laplace transforms of given functions.

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Name of Department: Electronics and Telecommunication Engineering

Class: -Second Year B. TECH Sem:-IV

Course: - PCC-ETC0243 Electromagnetic Engineering

Course Outcomes:

1. Understand the fundamentals of mathematical skills related to differential, integral, and vector calculus.
2. Apply and analyse the concepts of steady electric fields.
3. Apply and analyse the concepts of magnetic fields.
4. Develop field equations from understanding Maxwell's Equations & The relation between the fields under time-varying situations.
5. Understand the principles of propagation of uniform plane waves
6. Be aware of electromagnetic interference and compatibility

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Name of Department: Electronics and Telecommunication Engineering

Class: -Second Year B. TECH Sem:-IV

Course: - PCC-ETC0241 Linear Integrated Circuits

Course Outcomes:

1. Explain the internal circuit of operational amplifier and Analyze the differential amplifier.
2. Illustrate various Op-amp configurations.
3. Build and explain applications of Op-amp.
4. Design various Active filters
5. Analyze and design various waveform generators
6 . Make use of Op-amp ICs in various industrial applications

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Name of Department: Electronics and Telecommunication

Class: -Second Year B. TECH Sem: -IV

Course: - ETC-MNR-0244: Electronics Measurements

Course Outcomes:

1. Explain the working of different electromechanical indicating instruments.
2. Describe the construction and working of various electronic instruments.
3. Select an appropriate instrument for the required measurement.
4. Analyze, formulate, and select suitable transducer / sensor for the given industrial application.
5. Describe signal conditioning circuits.
6. Elucidate the concept of several AC bridges for inductance and capacitance

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Name of Department: Electronics and Telecommunication Engineering

Class: -Second Year B. TECH Sem:-IV

Course: - HSSM-ETC0247 Professional Ethics

Course Outcomes:

1. Create an awareness on Engineering Ethics and Human Values to instill Moral and Social Values and Loyalty and to appreciate the rights of others.
2. Understand Engineering Ethics
3. Create an awareness of seeing Engineering as Social Experimentation
4. Understand Safety, Responsibilities and Rights
5. Creating an awareness on Global Issues

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Name of Department: Electronics and Telecommunication Engineering Sem:-IV

Class: -Second Year B. TECH

Course: - VSEC ETC02412 Data Structure using C/C++

Course Outcomes:

1. Elaborate the basic concept of data structure & it‟s types.
2. Design and Implement the various algorithms on arrays & records.
3. Implement algorithms on linked list.
4. Understand the concept of stacks, queues & its applications.
5. Construct various types of trees & their applications.
6. Understand the concept of Graph & Hashing.

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Name of Department: Electronics and Telecommunication Engineering

Class: -Second Year B. TECH Sem: -IV

Course: - ETC-MNR-0244: Electronics Measurements

Course Outcomes:

1. Explain the working of different electromechanical indicating instruments.
2. Describe the construction and working of various electronic instruments.
3. Select an appropriate instrument for the required measurement.
4. Analyze, formulate, and select suitable transducer / sensor for the given industrial application.
5. Describe signal conditioning circuits.
6. Elucidate the concept of several AC bridges for inductance and capacitance

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Name of Department: Electronics and Telecommunication Engineering

Class: -Second Year B. TECH Sem: -IV

Course: - OPEN ELECTIVE-2

Course Outcomes:

1. Understand basic listening, speaking, and conversation skills.
2. Present ideas effectively using suitable styles and multimedia tools.
3. Apply visual, nonverbal, and aural communication cues.
4. Develop interpersonal skills and manage group interactions.
5. Use emotional intelligence, creativity, and critical thinking in problem-solving.
6. Demonstrate leadership, motivation, negotiation, and stress management skills.

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Name of Department: Electronics and Telecommunication

Class: -Second Year B. TECH Sem:-IV

Course: - VEC ETC02410 Simulation Lab

Course Outcomes:

1. Use the network simulator for learning and practice of networking algorithms.
2. Illustrate the operations of network protocols and algorithms
3. Implement data link layer farming methods.

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Name of Department: Electronics and Telecommunication

Class: -Second Year B. TECH Sem:-IV

Course: - PCC-ETC0242 Computer Network

Course Outcomes:

1. Classify different types of Computer Networks, distinguish between OSI and TCP/IP reference model.
2. Summarizes guided & unguided transmission media and different networking devices.
3. Identify, formulate, and manage data link communication.
4. Illustrate Protocols, addressing, routing algorithms and congestion control algorithms used at network layer.
5. Describe TCP, UDP Services and identify fields of TCP/IP header format.
6. Have a basic knowledge of the use of Application layer services.

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Name of Department : Electronics and Telecommunication

Class:-Third Year B.TECH Sem:-V

Course:- PCC-ETC501 Signals and System

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Demonstrate use of signals and their representation.

2 Represent CT & DT system

3 Use Fourier transform for analysis of CT & DT signals

4 Compute DFT and IDFT

5 Analyze signals using Z-transform

6 Realize the systems

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Name of Department: Electronics and Telecommunication

Class:- Third Year B.TECH Sem:-V

Course:-PCC-ETC502: Electromagnetic Engineering

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Explain the fundamentals of mathematical skills related with differential, integral and vector calculus.

2 Apply and analyze the concepts of steady electric & magnetic fields.

3 Develop field equations

4 Understanding of Maxwell's Equations.

5 Extend the knowledge of basic properties of transmission lines

6 To analyze electromagnetic wave propagation in generic transmission line geometries

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Name of Department: Electronics and Telecommunication

Class:-Third Year B.TECH Sem:-V

Course:-PCC-ETC503: Digital and VLSI Design Engineering

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Apply Boolean laws/K-Map-method, to reduce a given Boolean function

2 Design & realize combinational logic circuits using logic gates.

3 Demonstrate the operation of flip-flops, counters, shift registers Synchronous sequential machine using Moore and Mealy machine

4 Design combinational and sequential logic circuits using various description techniques in VHDL

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Name of Department: Electronics and Telecommunication

Class:-Third Year B.TECH Sem:-V

Course:-PCC-ETC504: Optical Communication

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Differentiate the different types of optical fiber structures and light propagating mechanisms.

2 Acquire knowledge of signal degradation mechanism in optical fiber.

3 Understand the construction of and working of optical sources and detectors.

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Name of Department: Electronics and Telecommunication
Class:-Third Year B.TECH Sem:-V

Course:- OEC-ETC501: Industrial Automation

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Demonstrate the working of PLC, DCS and SCADA

2 Apply the concept; analyze the importance and application of industrial automation.

3 Compile ideas into new different solutions with the help of programming languages as per IEC 61131-3.

4 Apply the knowledge of automation for design and development of Graphical user interface for different process.

5Use the advanced software tools for Industrial Automation such Codesys ,GX Works 2, RS logix 5000 , Delta V Explorer etc.

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Name of Department: Electronics and Telecommunication

Class:-Third Year B.TECH Sem:-V

Course: PCC-ETC505: Simulation and Modeling

Course Outcomes: Upon successful completion of this course, the students will be able to:

1 Understand the python programming basics

2 Able to solve programs on decision making & looping statements in python

3 Understand python list, tuple, and dictionary collection concepts

4 Understand simulation programs using SimPy Library

5 Design & Apply Simpy library functions to model real time problems.

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Name of Department: Electronics and Telecommunication

Class:Third Year B.TECH Sem:-VI

Course: PCC-ETC 601: Digital Signal Processing

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Make use of FFT algorithm for filtering of long duration sequences

2 Design digital FIR filters

3 Design digital IIR filters

4 Implement FIR and IIR filters using DSP Processor

5 Apply the basic concept of Multirate digital signal processing

6 Apply the basic concept of wavelet transform

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Name of Department: Electronics and Telecommunication
Class:Third Year B.TECH Sem:-VI

Course: PCC-ETC 602: Microprocessor and Microcontroller

Course Outcomes: Upon successful completion of this course, the students will be able to:

1. Describe Architecture of 8085 and write various Programs.
2. Implement Interrupts and interfacing of memory, 8255 with 8085.
3. Describe Architecture of 8051 and write various Programs.
4. Perform experiment using ON-Chip resources of 8051.
5. Select I/O peripherals to satisfy system design requirements.
6. Design Embedded „C" Programs for I/O Peripheral

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Name of Department: Electronics and Telecommunication
Class:-Third Year B.TECH Sem:-VI

Course: PCC-ETC 603: Power Electronics

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Understand the characteristics of various power electronics devices and Compare the different firing circuits.

2 Analyze converters, Inverters and Choppers.

3 Understand the Industrial applications of Power circuits.

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Name of Department: Electronics and Telecommunication
Class:-Third Year B.TECH Sem:-VI

Course: PCC-ETC604: Antenna and Wave Propagation

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Realize the importance of basics of antenna systems to

2differentiate the applicability of each type of antenna

3 Analyze the utilization of Antenna systems in wide

4areas like wireless communication, fixed line

5communication, computer communication etc.

6 Discuss radio wave propagation

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Name of Department: Electronics and Telecommunication

Class:-Final Year B.Tech. Sem-VII

Course:-PCC-ETC701: Satellite Communication

Course Outcomes: Upon successful completion of this course, the students will be able to:

1 Understand Orbital aspects involved in satellite communication.

2 Understand various subsystems in satellite communication system

3 Explain and Analyze Link budget calculation.

4 Understand Satellite Network System

5 Explain Non Geostationary Satellite Systems

6 Explain different applications of Satellite Systems

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Name of Department: Electronics and Telecommunication

Class:-Final Year B.TECH Sem:-VII

Course:-PCC-ETC 702: Embedded Systems

Course Outcomes: Upon successful completion of this course, the students will be able to:

1. Develop programs using PIC 16F877
2. Apply on-chip resource facility of PIC 16F877.
3. Understand embedded systems and concepts of ARM7.
4. Develop programs using ARM7
5. Apply on chip resource facility of LPC 2148.
6. Understand RTOS concept

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Name of Department: Electronics and Telecommunication

Class:-Second Year B.TECH Sem:-III

Course:- PCC-ETC703 Computer Network

Course Outcomes:

Upon successful completion of this course, the student will be able to:

1 State the evolution of Computer network, classifies different types of Computer Networks.

2 Design, implements, and analyzes simple computer networks.

3 Identify, formulate, and solve network engineering problems.

4 Illustrate different OSI and TCP/IP protocols.

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Name of Department: Electronics and Telecommunication

Class: Final B.TECH Year Sem:-VII

Course: PCC-ETC704: Image processing

Course Outcomes: Upon successful completion of this course, the students will be able to:

1 List fundamental steps involved in Digital Image Processing.

2 Apply different transforms and filtering techniques on an image.

3 Apply morphological operations

4 Perform image segmentation

5 Apply compression techniques.

6 Perform various operations on color image.

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Name of Department: Electronics and Telecommunication

Class:-FinalYearB.Tech Sem:-VII

Course:-PCE-ETC701: JAVA SCRIPT (ELECTIVE-I)

Course Outcomes: Upon successful completion of this course, the students will be able to:

1 Identity and apply JS objects in web applications.

2 Articulate and write user define functions.

3Describe and develop user –

4rowser interactions.

5 Explain the principles of object oriented programming paradigm.

6 Use and illustrate the events, cookies and handling exceptions

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Name of Department: Electronics and Telecommunication

Class:-Final Year B.Tech Sem:-VII

Course:- PW-ETC701 : Project Phase-I

Course Outcomes: After the completion of the course the student should be able to:

1 Identify the problem statement through literature survey for project work.

2 Develop design strategy for the project work

3 Develop presentation and interpersonal communication skills through project work.

4 Develop the ability to learn independently and to find/integrate information from different sources required in solving real-life problems.

5 enhance technical report writing skills with proper organization of materials;

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Name of Department: Electronics and Telecommunication

Class:- Final Year B.Tech SEM:VIII

Course:- PCC-ETC-801: Microwave Engineering

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1. Analyze the microwave waveguides and passive circuit components.
2 Identify and differentiate the state of art in microwave tubes and their uses in real life
3 Identify materials used in MMIC and microwave hazards
4 Differentiate solid state devices used in microwave based on their characteristics and operations
5 Measure the output power, VSWR, impedance, frequency and wavelength of microwave signal

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Name of Department: Electronics and Telecommunication

Class:-Final Year B.Tech Sem:-VIII

Course:-PCC-ETC 802: Wireless Communication

Course Outcomes: Upon successful completion of this course, the students will be able to:

1List basic fundamentals of wireless communication

2Analyze large & small scale radio wave propagation

3Able to understand basic wireless technologies

4 Able to understand and analyze wireless concept

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Name of Department: Electronics and Telecommunication

Class:-Final Year B.Tech Sem:-VIII

Course:-PCC- ETC 803: Video Engineering

Course Outcomes: Upon successful completion of this course, the students will be able to:

1 Describe picture and sound transmission and reception

2 Explain color composite video signal

3 Describe principle of digital TV system

4 Explain high definition television system

5 Elaborate concept of video conferencing and videophone.

6 Describe advanced TV system like LCD, plasma, LED, CCTV, etc.

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Name of Department: Electronics and Telecommunication

Class:-Final Year B.TECH Sem:-VIII

Course:-PCE-ETC 801: High Performance Communication Networks (Elective II)

Course Outcomes:

Upon successful completion of this course, the students will be able to:

1 Illustrate the different communication networks using the architecture and frames format 2 Design and analyzes simple communication networks.

2 Compare various high performance networks.

3 Develop and research on various networks and its interoperability.