Course Outcome of M.E (ECE)

PEC108/109: EMBEDDED SYSTEMS DESIGN

The students will be able to

1. Recognize the Embedded system and its programming, Embedded Systems on a Chip (SoC) and the use of VLSI designed circuits.
2. Identify the internal Architecture and perform the programming of ARM processor.
3. Program the concepts of Arduino Microcontroller with various interfaces like memory & I/O devices and Raspberry Pi based embedded platform.
4. Analyze the need of Real time Operating System (RTOS) in embedded systems.
5. Recognize the Real time Operating system with Task scheduling and Kernel Objectives.

PEC101: DISCRETE TIME SIGNAL PROCESSING

1. The students will be able to
2. Recognize the concept of discrete time signal processing and filter design techniques.
3. Analyze the theory of adaptive filter design and its applications.
4. Evaluate the spectra of random signals and variety of modern and classical spectrum estimation techniques.

PEC104: ANTENNA SYSTEMS

The students will be able to

1. Acquire knowledge about basic antenna concepts.
2. Recognize thin linear antennas and arrays.
3. Identify secondary sources, aperture, broadband and frequency independent antennas.
4. Apply the knowledge of mutual coupling on antennas, applications and numerical techniques.
5. Comprehend the adaptive array concept.

PEC105: ADVANCED COMMUNICATION SYSTEMS

The students will be able to

1. Recognize Optimum Receivers for AWGN Channels.
2. Analyze the pass band communication and modulation techniques to understand the small scale fading models.
3. Comprehend the concept of Carrier and Symbol Synchronization.
4. Analyse the concept of ISI and its removal.
5. Describe the concept of communication in band limited channels.

PEC106: OPTICAL COMMUNICATION NETWORKS

The students will be able to

1. Identify, formulate and solve optical communication networks related problems using efficient technical approaches.
2. Design optical networks as well as to interpret statistical and physical data.

3. Design and implement WDM networks.
4. Apply the knowledge to control and manage the functions of optical networks.
5. Recognize the network survivability by various protection schemes.

PEC339: IMAGE PROCESSING AND COMPUTER VISION

The students will be able to
1. Recognize the fundamental techniques of Image Processing and Computer Vision.
2. Interpret the basic skills of designing image compression.
3. Distinguish between different image compression standards.
4. Analyse different computer vision techniques
5. Analyse real time image processing system.

PEC207: RF DEVICES AND APPLICATIONS

The students will be able to
1. Recognize semiconductor device theory at an advanced level including the use of energy band diagram as applied to devices like BJT and MOSFETs.
2. Solve device equations based on equations of continuity and the derivation of C-V and I-V equations of High Frequency devices.
3. Comprehend and develop the equivalent circuit of High Frequency devices and simplify them for analytical work.
4. Carry out the fabrication of devices like SBD, Tunnel diode, DIMOSFET and SiC power devices.

PEC211: PASSIVE OPTICAL NETWORKS

The students will be able to
1. Recognize and evaluate the performance of various enabling technologies used in modern optical networks.
2. Evaluate different WDM network topologies including broadcast-and-select and wavelength routing networks.
3. Design virtual WDM network topologies.
4. Analyze Photonic packet switching networks and time domain optical networking approaches.

PEC212: AUDIO AND SPEECH PROCESSING

The students will be able to
1. Acquire the knowledge about audio & speech signals.
2. Recognize speech generation models.
3. Analyze the audio & speech signal estimation & detection.
4. Acquire knowledge about hardware to process audio & speech signals.
5. Integrate human physiology and anatomy with signal processing paradigms.

PEC215: DETECTION AND ESTIMATION THEORY

The students will be able to

1. Recognize the fundamental concepts of detection and estimation theory involving signal and system models in which there is some inherent randomness and to investigate how to use tools of probability and signal processing to estimate signals and parameters.
2. Identify the optimal estimator/detector or at least bound the performance of any estimator/detector and to study various linear and nonlinear estimation techniques for the detection and estimation of signals with and without noise.
3. Investigate the analytical aspects of various optimum filters/receivers with their system realization and also study various adaptive filters and their mathematical models for detection of Gaussian signals.
4. Apply the concept of white and colored noise with their finite state representation. Also, study is to be done on the time-frequency signal analysis and processing with their various mathematical distribution tools.
5. Evaluate the detection of Doppler-spread targets and the canonical receiver realizations, alongwith the performance of the optimum receiver. Also, study about the models for doubly-spread targets and channels.

PEC216: ADVANCED COMPUTER NETWORKS AND PROTOCOLS

The students will be able to

1. Acquire knowledge about Network Fundamentals.
2. Identify Internetworking.
3. Recognize the Network Standards and Standard Organizations.
4. Interpret the TCP/IP Network Interface Layer Protocol .
5. Acquire knowledge about Routing and Application Layer Protocols.

PEC218: DIGITAL SIGNAL PROCESSORS

The students will be able to

1. Acquire knowledge about Fixed and floating point number systems.
2. Recognize the internal Structures of DSP Processors and memory accesses.
3. Analyse addressing instructions of a DSP processors.
4. Recognize the internal architecture, instructions set, programming and interfacing of different peripheral devices with TMS320C3X, TMS320C5X, TMS320C6X, ADSP 21XX DSP Chips.

PEC: MULTIMEDIA COMPRESSION TECHNIQUES

The students will be able to

1. Recognize and develop human speech mode, understand characteristics of human's visual system, understand the characteristics of human's audio system.
2. Evaluate different compression principles, understand different compression techniques, understand different multimedia compression standards, be able to design and develop multimedia systems according to the requirements of multimedia applications.
3. Analyze the various signal processing aspects of achieving high compression ratios.

4. Recognize and develop new paradigm technologies in audio and video coding.
5. Describe the application of modern multimedia compression techniques in the development of new wireless communication protocols.

PEC: FRACTIONAL TRANSFORMS AND APPLICATIONS

The students will be able to
1. Recognize Time frequency analysis of signals.
2. Describe the concepts of Fractional Fourier Transform.
3. Identify the various applications of Fractional Transform.
4. Evaluate different types of Fractional Fourier Transforms.

PEC: OPTOELECTRONICS

The students will be able to
1. Recognize fundamentals, advantages and advances in optoelectronic devices, circuits and systems.
2. Acquire a detailed understanding of types, basic properties and characteristics of optical waveguides, modulators and detectors.
3. Dewcribe the knowledge of design, working, Classification and analysis of Semiconductor Lasers, LEDs, and modulators.
4. Identify, formulate and solve engineering and technological problems related to optical sources, displays, detectors and optical measurements.

PEC: HDL AND SYSTEM C PROGRAMMING

The students will be able to
1. Design and model digital systems in VHDL and SystemC at different levels of abstraction.
2. Analyse the partition of a digital system into different subsystems.
3. Simulate and verify a design.
4. Synthesize a model from its simulation version.
5. Apply modern software tools for digital design in VHDL.

PEC: MICROSTRIP ANTENNAS

The students will be able to
1. Recognize the basic concept of micro-strip antennas, methods of analysis and configurations.
2. Analyze micro-strip antennas arrays.
3. Evaluate the physical significance of discontinuities.
4. Evaluate the significance of different micro-strip feed mechanism available.
5. Recognize coupled micro-strip line with multiband and broadband behavior.
6. Demonstrate the CPW feeding technique and its implementation.

PEC: MACHINE LEARNING

The students will be able to
1. Differntiate the parametric and non parametric estimations.
2. Recognize data in the pattern space.
3. Design a Trainer and test classifiers using supervised learning.
4. Apply clustering algorithms to process big data real time.
5. Apply Bayesian parameter estimation to real world problems.

PEC: ADAPTIVE SIGNAL PROCESSING

The students will be able to
1. Acquire knowledge about Signals and Systems.
2. Identify Estimation Theory.
3. Describe the Estimation of Waveforms.
4. Recognize system modeling and Identification.
5. Acquire knowledge about Adaptive Filtering.
6. Acquire knowledge about Adaptive Equalization.
7. Acquire knowledge about Non-stationary Signal Analysis and its Applications.

PEC: ROBOTICS AND AUTOMATION

The students will be able to
1. Recognize the basics of robotics and their functionality.
2. Comprehend the fundamentals of sensors.
3. Evaluate various driver systems for robots.
4. Analyze the image processing and computer vision for robotics.
5. Recognize development of algorithms for robot kinematics.

PEC: ADVANCED OPTICAL TECHNOLOGIES

The students will be able to
1. Recognize the Fundamentals, advantages and advances in optical devices and circuits.
2. Describe advanced optical waveguides, detectors, amplifiers, silicon photonics and MEMS applications in photonics.
3. Acquire Knowledge of Design, working, Classification and analysis of Advanced Semiconductor Lasers and High speed modulators.

PEC: ARTIFICIAL INTELLIGENCE

The students will be able to
1. Analyse the applications of artificial intelligence and categorize various problem domains, uninformed and informed search methods.
2. Identify advanced search techniques and algorithms like minimax for game playing.
3. Recognize the importance of probability in knowledge representation for reasoning under uncertainty.

4. Describe Bayesian networks and drawing Hidden Markov Models.
5. Interpret the architecture for intelligent agents and implement an intelligent agent.

PEC: BIOMEDICAL SIGNAL PROCESSING

The students will be able to
1. Recognize the basics of various biomedical signals.
2. Comprehend the fundamentals of processes related to biomedical signals.
3. Analyze various parameters related to biomedical signals.
4. Evaluate data compression and its application in biomedical field.
5. Recognize neurological models of ECG, etc.

PEC: CLOUD COMPUTING

The students will be able to
1. Recognize different cloud architectures.
2. Apply the knowledge of data processing in cloud.
3. Apply clustering algorithms to process big data real time.
4. Identify the security issues in cloud environment.
5. Comprehend the nuances of cloud based services.

PEC: RF CIRCUIT DESIGN

The students will be able to
1. Describe the knowledge about Basic Principles in RF Design.
2. Identify Distributed Systems.
3. Analyse high frequency Amplifier Design.
4. Design Low Noise Amplifier (LNA)
5. Apply the knowledge about Mixers and RF Power Amplifiers.

PEC: IP OVER WDM

The students will be able to
1. Describe the knowledge about protocol design concepts, electro-optic and wavelength conversion.
2. Define Terabit Switching and Routing Network Elements& Optical Network Engineering.
3. Analyze the performance of Traffic Management for IP-over-WDM and Wavelength-Routing Networks.
4. Analyze Internetworking Optical Internet and Optical Burst Switching, Survivability in IP-over-WDM Networks.
5. Differntiate Optical Internetworking Models and Standards Directions.

PEC: SOFT COMPUTING TECHNIQUES

The students will be able to

1. Solve Pattern Classification & Function Approximation Problems.
2. Design appropriate ANN model for a given Problem.
3. Apply data pre-processing techniques.
4. Design Fuzzy inference systems from linguistic models.
5. Design genetic optimization to create objective functions for a given optimization problem.