MEENAKSHI COLLEGE OF ENGINEERING
No 12, Vembuli Amman Kovil Street, West K.K Nagar, Chennai – 600078

M.E. APPLIED ELECTRONICS
Regulation 2021

Course Outcomes

Semester I

Course Name MA4101 Applied Mathematics for Electronics Engineers

CO1	Apply the concepts of fuzzy sets, fuzzy logic, fuzzy prepositions and fuzzy quantifiers and in relate.
CO2	Analyze the performance in terms of probabilities and distributions achieved by the determined solutions.
CO3	Use some of the commonly encountered two dimensional random variables and extend to multivariate analysis.
CO4	Classify various random processes and solve problems involving stochastic processes.
CO5	Use queueing models to solve practical problems.

Course Name RM4151 RESEARCH METHODOLOGY AND IPR

CO1	Plan and carry out effective research projects using different research methods
CO2	Use basic statistical tools to analyze research data and draw meaningful conclusions.
CO3	understand existing research papers, and identify key findings and gaps.
CO4	Learn about different types of intellectual property (like patents and copyrights) and how to protect their own work.
CO5	Understand the importance of ethical practices in research and ensure their work meets these standards.

Course Name AP4151 Advanced Digital Signal Processing

CO1	Describe the basics of Digital Signal Processing and Discrete Time Transforms.
CO2	Design and implement FIR/IIR digital filters using various structures.
CO3	Estimate power spectrum using appropriate parametric/non-parametric method
CO4	Design discrete time system for the given application using Multi rate signal processing
CO5	Analyze discrete time system at different sampling frequencies using the concept of Multirate signal processing

Course Name AP4152 Advanced Digital System Design

CO1	Analyse and design synchronous sequential circuits
CO2	Analyse hazards and design asynchronous sequential circuits
CO3	Knowledge on the testing procedure for combinational circuit and PLA
CO4	Able to design PLD and ROM
CO5	Design and use programming tools for implementing digital circuits of industry standards

Course Name AP4153 Semiconductor Devices and Modeling

CO1	Explore the properties of MOS capacitors.
CO2	Analyze the various characteristics of MOSFET devices.
CO3	Describe the various CMOS design parameters and their impact on performance of the device.
CO4	Discuss the device level characteristics of BJT transistors.
CO5	Identify the suitable mathematical technique for simulation.

Course Name VL4152 Digital CMOS VLSI Design

CO1	Use mathematical methods and circuit analysis models in analysis of CMOS digital circuits
CO2	Create models of moderately sized static CMOS combinational circuits that realize specified digital functions and to optimize combinational circuit delay using RC delay models and logical effort
CO3	Design sequential logic at the transistor level and compare the tradeoffs of sequencing elements including flip
CO4	Understand design methodology of arithmetic building blocks
CO5	Design functional units including ROM and SRAM

Course Name AP4111 Electronics System Design Laboratory

CO1	Design an instrumentation amplifier and voltage regulator
CO2	Design a PCB layout using CAD tool
CO3	Write a Verilog code for various combinational and sequential circuits
CO4	Develop a memory module with FPGA
CO5	Design an PLL circuit

Course Name AP4112 Signal Processing Laboratory

CO1	Understand the audio signal analysis using filters
CO2	Understand the working of statistical method based approaches
CO3	Design the filters
CO4	Demonstrate the working of algorithms for different applications
CO5	knowledge of analyzing the images and video

Semester II

Course Name AP4201 Analog and Mixed Signal IC Design

CO 1	Carry out research and development in the area of analog and mixed signal IC design.
CO2	Well versed with the MOS fundamentals, small signal models and analysis of MOSFET based circuits.
CO3	Analyse and model data converters architecture
CO4	Understand and Design different mixed signal circuits for various applications as per the user specifications.
CO5	Analyze and design mixed signal circuits such as Comparator, ADCs, DACs, PLL

Course Name AP4251 Industrial Internet of Things

CO1	Understand the basic concepts and Architectures of Internet of Things
CO2	Understand various IoT Layers and their relative importance
CO3	Realize the importance of Data Analytics in IoT.
CO4	Study various IoT platforms and Security
CO5	Understand the concepts of Design Thinking.

Course Name AP4202 Power Conversion Circuits for Electronics

CO1	Describe the characteristics, operation of power switching devices and identify their ratings and applications.
CO2	Understand the requirements SCR Protection, Describe the Functioning of SCR their Construction and Performance.
CO3	Analyze and Design the Converter Based on SCR for various Industrial Applications.
CO4	Demonstrate ability to understand High Frequency, Heating Systems, Timers, Relevant Sensors & Actuator and their Application in Industrial Setting.
CO5	Demonstrate the ability to understand and apply Data Communication, Telemetry & SCADA System in Industrial Applications.

Course Name AP4203 Embedded Systems

CO1	Design an Embedded system
CO2	Understand a general and single purpose processor
CO3	Explain different protocols
CO4	Discuss state machine and design process models
CO5	Outline embedded software development tools and RTOS T

Course Name VL4092 Soft Computing and Optimization Techniques

CO1	Develop application on different soft computing techniques like Fuzzy, GA and Neural network
CO2	Implement Neuro-Fuzzy and Neuro-Fuzz-GA expert system
CO3	Implement machine learning through Neural networks.
CO4	Model Neuro Fuzzy system for clustering and classification.
CO5	Able to use the optimization techniques to solve the real world problems

Course *Name* AP4004 Nano Technologies

CO1	Understand the basic concepts of nano electronics and various aspects of nano electronics.
CO2	Summarize the basic knowledge of Semiconductor materials and carbon nano tubes.
CO3	Understand the basic concepts of MOS scaling.
CO4	Understand the advanced nanoscale devices
CO5	Understand the Bio sensor devices.

Course Name AP4211 VLSI Design Laboratory

CO1	Program in Verilog/VHDL for combinational and sequential circuits and implement the program in FPGA
CO2	Implement FIR and IIR filters in FPGA
CO3	Implement data path design and interfaces
CO4	Handle CAD tools to draw/edit, and analyze the CMOS circuits
CO5	Program and interface the Arduino Boards using Embedded C

Semester III

Course Name CU4076 VLSI for Wireless Communication

CO1	Able to recollect basic wireless communication concepts
CO2	To understand the parameters in receiver and design a low noise amplifier
CO3	In a position to apply his knowledge on various types of mixers designed for wireless communication.
CO4	D esign PLL and VCO
CO5	Understand the concepts of transmitters and utilize the power amplifiers in wireless communication.

Course Name AP4008 Advanced Microprocessors and Microcontrollers Architectures

CO1	To understand the fundamentals of microprocessor architecture
CO2	To know and appreciate the high performance features in CISC architecture.
CO3	To know and appreciate the high performance features in RISC architecture
CO4	To perceive the basic features in Motorola microcontrollers.
CO5	To interpret and understand PIC Microcontroller.

Course Name IF4071 Deep Learning

CO1	Feature Extraction from Image and Video Data
CO2	Implement Image Segmentation and Instance Segmentation in Images
CO3	Implement image recognition and image classification using a pretrained network (Transfer Learning)
CO4	Traffic Information analysis using Twitter Data
CO5	Autoencoder for Classification & Feature Extraction

Couse Name OBA431 Sustainable Management

CO1	An understanding of sustainability management as an approach to aid evaluating and minimizing environmental impacts while achieving the expected social impact
CO2	An understanding of cooperate sustainability and responsible business practices
CO3	Knowledge and skills to understand, to measure and interpret sustainability performances.
CO4	Knowledge of innovative practices in sustainable business and community
CO5	Deep understanding of sustainable management of resources and commodities