

M.E APPLIED ELECTRONICS
COURSE OUTCOMES FOR R2021

YEAR/SEMESTER: I / I	
C101/MA4101-Applied Mathematics for Electronics Engineers	
C101.1	Apply the concepts of fuzzy sets, fuzzy logic, fuzzy prepositions and fuzzy quantifiers and in relate
C101.2	Analyze the performance in terms of probabilities and distributions achieved by the determined solutions
C101.3	Use some of the commonly encountered two dimensional random variables and extend to multivariate analysis
C101.4	Classify various random processes and solve problems involving stochastic processes
C101.5	Use queuing models to solve practical problems
C102/RM4151-Research Methodology and IPR	
C102.1	Understand the research problem and research process
C102.2	Understand research ethics
C102.3	Prepare a well-structured research paper and scientific presentations
C102.4	Explore on various IPR components and process of filing
C102.5	Understand the adequate knowledge on patent and rights
C103 / AP4151-Advanced Digital Signal Processing	
C103.1	Describe the basics of Digital Signal Processing and Discrete Time Transforms
C103.2	Design and implement FIR/IIR digital filters using various structures
C103.3	Estimate power spectrum using appropriate parametric/non-parametric method
C103.4	Analyze discrete time system at different sampling frequencies using the concept of Multirate signal processing
C103.5	Design discrete time system for the given application using Multi rate signal processing

C104 / AP4152- Advanced Digital System Design	
C104.1	Analyse and design synchronous sequential circuits
C104.2	Analyse hazards and design asynchronous sequential circuits
C104.3	Knowledge on the testing procedure for combinational circuit and PLA
C104.4	Able to design PLD and ROM
C104.5	Design and use programming tools for implementing digital circuits of industry standards
C105/AP4153-Semiconductor Devices and Modeling	
C105.1	Explore the properties of MOS capacitors
C105.2	Analyze the various characteristics of MOSFET devices
C105.3	Describe the various CMOS design parameters and their impact on performance of the device
C105.4	Discuss the device level characteristics of BJT transistors
C105.5	Identify the suitable mathematical technique for simulation
C106 / VL4152 - Digital CMOS VLSI Design	
C106.1	Use mathematical methods and circuit analysis models in analysis of CMOS digital circuits
C106.2	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
C106.3	Design sequential logic at the transistor level and compare the tradeoffs of sequencing elements including flip-flops, transparent latches
C106.4	Understand design methodology of arithmetic building blocks
C106.5	Design functional units including ROM and SRAM
C107/ AP4111-Electronics System Design Laboratory	
C107.1	Design an instrumentation amplifier and voltage regulator
C107.2	Design a PCB layout using CAD tool
C107.3	Write a Verilog code for various combinational and sequential circuits
C107.4	Develop a memory module with FPGA
C107.5	Design an PLL circuit

C108/ AP4112 - SIGNAL PROCESSING LABORATORY	
C108.1	Obtain the ability to apply knowledge of linear algebra, random process and multirate signal processing in various signal processing applications
C108.2	Develop the student's ability on conducting engineering experiments, analyze experimental observations scientifically
C108.3	Become familiar to fundamental principles of linear algebra
C108.4	Familiarize the basic operations of filter banks through simulations
C108.5	Apply the principles of random process in practical applications
YEAR/SEMESTER: I / II	
C201/AP4201 - Analog and Mixed Signal IC Design	
C201.1	Carry out research and development in the area of analog and mixed signal IC design
C201.2	Well versed with the MOS fundamentals, small signal models and analysis of MOSFET based circuits
C201.3	Analyse and model data converters architecture
C201.4	Understand and Design different mixed signal circuits for various applications as per the user specifications.
C201.5	Analyze and design mixed signal circuits such as Comparator, ADCs, DACs, PLL
C202/ AP4251-Industrial Internet of Things	
C202.1	Understand the basic concepts and Architectures of Internet of Things
C202.2	Understand various IoT Layers and their relative importance
C202.3	Realize the importance of Data Analytics in IoT
C202.4	Study various IoT platforms and Security
C202.5	Understand the concepts of Design Thinking
C203/ AP4202 – Power Conversion Circuits for Electronics	
C203.1	Describe the characteristics, operation of power switching devices and identify their ratings and applications
C203.2	Understand the requirements SCR Protection, Describe the Functioning of SCR their Construction and Performance

C203.3	Analyze and Design the Converter Based on SCR for various Industrial Applications
C203.4	Demonstrate ability to understand High Frequency, Heating Systems, Timers, Relevant Sensors & Actuator and their Application in Industrial Setting
C203.5	Demonstrate the ability to understand and apply Data Communication, Telemetry & SCADA System in Industrial Applications
C204/ AP4203 – Embedded Systems	
C204.1	Able to design an Embedded system
C204.2	Understand a general and single purpose processor
C204.3	Explain different protocols
C204.4	Discuss state machine and design process models
C204.5	Outline embedded software development tools and RTOS
C205/AP4004-Nano Technologies	
C205.1	Understand the basic concepts of nano electronics and various aspects of nano electronics
C205.2	Summarize the basic knowledge of Semiconductor materials and carbon nano tubes
C205.3	Understand the basic concepts of MOS scaling
C205.4	Understand the advanced nano scale devices
C205.5	Understand the Bio sensor devices
C206/AP4091-Automotive Electronics	
C206.1	Explain the fundamentals, operation, function of various sensors and actuators in engine management systems
C206.2	Explain the Automotive Transmission Control Systems
C206.3	Enumerate the principles, application, construction and specification of different sensors and actuators usable in typical automobile by suitable testing
C206.4	List out the principles and characteristics of charging system components and demonstrate their working with suitable tools
C206.5	Describe the principles and architecture of electronics systems and its

	components present in an automobile related to instrumentation, control, security and warning systems
C207/AP4211-VLSI Design Laboratory	
C207.1	Program in Verilog/VHDL for combinational and sequential circuits and implement the program in FPGA
C207.2	Implement FIR and IIR filters in FPGA
C207.3	Implement data path design and interfaces
C207.4	Handle CAD tools to draw/edit, and analyze the CMOS circuits
C207.5	Program and interface the Arduino Boards using Embedded C
YEAR/SEMESTER: II/III	
C301/ AP4008- Advanced Microprocessors and Microcontrollers Architectures	
C301.1	To understand the fundamentals of microprocessor architecture
C301.2	To know and appreciate the high performance features in CISC architecture
C301.3	To know and appreciate the high performance features in RISC architecture
C301.4	To perceive the basic features in Motorola microcontrollers
C301.5	To interpret and understand PIC Microcontroller
C302/AP4010 - Modeling and Synthesis with HDL	
C302.1	Demonstrate knowledge on HDL design flow and digital circuits design
C302.2	Design and develop the combinational and sequential circuits using various modeling
C302.3	Solving algorithmic state machines using hardware description language
C302.4	Analyze the process of synthesizing the combinational and sequential descriptions
C302.5	Know the advantages of programmable logic devices and their description in Verilog
C303/CU4076-VLSI for Wireless Communication	
C303.1	Able to recollect basic wireless communication concepts
C303.2	To understand the parameters in receiver and design a low noise

	amplifier
C303.3	In a position to apply his knowledge on various types of mixers designed for wireless communication
C303.4	Design PLL and VCO
C303.5	Understand the concepts of transmitters and utilize the power amplifiers in wireless communication
C304/OBA433- Intellectual Property Rights	
C304.1	Understanding of intellectual property and appreciation of the need to protect it
C304.2	Awareness about the process of patenting
C304.3	Understanding of the statutes related to IPR
C304.4	Ability to apply strategies to protect intellectual property
C304.5	Ability to apply models for making strategic decisions related to IPR
C305/AP4311 - Project Work I	
C305.1	Design and analyze, an identified problem using scientific tools
C305.2	Simulation/ Theoretical analysis of a physical system
C305.3	Integrate various domain knowledge for a sustainable solution
C305.4	Set Goals, Targets, timeline, plan and execute activities of the project
C305.5	Disseminate work both in oral and written format.
YEAR/SEMESTER- II/IV	
C401/AP4411 - Project Work II	
C401.1	Design and analyze, an identified problem using scientific tools and research simulation/ theoretical analysis of a physical system
C401.2	Simulation/ Theoretical analysis of a physical system
C401.3	Integrate various domain knowledge in carrying out experimental work and provide a sustainable solution.
C401.4	Set Goals, Targets, timeline, plan and execute activities of the project
C401.5	Disseminate work both in oral and written format