R.M.K. ENGINEERING COLLEGE

RSM Nagar, Kavaraipettai – 601 206

Department of Electronics and Communication Engineering

Course Outcomes – ODD-EVEN Semester 2021-22

Third Semester

20CS202 ̶ Python Programming(Lab Integrated)

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Implement simple Python programs.
CO2	Develop Python programs using functions.
CO3	Represent and solve compound data using Python lists, tuples, dictionaries.
CO4	Implement and perform operations on files, modules and packages.
CO5	Apply Exceptions, Standard Libraries and IDE for application development.
CO6	To learn how to use exception handling in python application for error handling.

20MA303 – Linear Algebra and Partial Differential equations

COs	Course Outcome: The students, after the completion of the course, are expected to….
CO1	Determine the dimension and bases of the vector spaces
CO2	Compute the matrix representation of the linear transformation under the given basis.
CO3	Relate the concept of inner product space in orthogonalization.
CO4	Compute the solutions of partial differential equations.
CO5	Utilize the Fourier series for wave equations.

20EE401 – Control Systems

COs	Course Outcome: The students, after the completion of the course, are expected to….
CO1	Develop mathematical model of linear mechanical and electrical systems.
CO2	Summarize the time response analysis of first and second order systems.
CO3	Determine the applications of P, PI, PID controllers.
CO4	Analyze the frequency response of open and closed loop systems.
CO5	Estimate the stability and suitable compensators for the given system.
CO6	Examine the state variables, controllability and observability of linear and time invariant systems.

20EC302 – Electronic Circuits

COs	Course Outcome: The students, after the completion of the course, are expected to….
CO1	Analyze biasing of BJT and BJT amplifiers
CO2	Analyze biasing of MOSFET and MOSFET amplifiers.
CO3	Compute the frequency response of amplifiers.
CO4	Acquire the knowledge of feedback amplifiers
CO5	Acquire the knowledge of oscillators.
CO6	Illustrate the operation of power amplifiers.

20EC301 – Signals and Systems

COs	Course Outcome: The students, after the completion of the course, are expected to….
CO1	Analyze the properties of Signals and Systems.
CO2	Apply Fourier transform and Laplace transform in Continuous Time signal analysis
CO3	Analyze Continuous Time LTI systems using Fourier and Laplace transforms.
CO4	Apply DTFT and Z transform in Discrete Time signal analysis.
CO5	Analyze Discrete Time LTI systems using DTFT and Z transform.
CO6	Apply Convolution operation for Continuous and Discrete time systems.

20EC303 – Digital Electronics

COs	Course Outcome: The students, after the completion of the course, are expected to….
CO1	Implement Boolean expression using logic gates.
CO2	Design Combinational circuits for a given function using logic gates.
CO3	Implement synchronous and asynchronous sequential circuits for a given application.
CO4	Summarize the types of memory devices.
CO5	Design the combinational logic circuits using Programmable Logic Devices.
CO6	Analyze the various logic families and their characteristics

Practical

20CS202- Python Programming

COs	Course Outcome: The students, after the completion of the course, are expected to.
CO1	Implement simple Python programs
CO2	Develop Python programs using functions.
CO3	Represent and solve compound data using Python lists, tuples, dictionaries.
CO4	Implement and perform operations on files, modules and packages
CO5	Apply Exceptions, Standard Libraries and IDE for application development

20EC311 – Analog & Digital Circuits Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Analyze the characteristics of basic electronic devices
CO2	Analyze the frequency response of the amplifiers
CO3	Analyze the feedback amplifiers and oscillators
CO4	Simulate frequency response of the amplifiers using spice tool.
CO5	Simulate frequency response of the oscillators using spice tool
CO6	Design and test the digital logic circuits.

20EC312-Foundation Lab on IoT

COs	Course Outcome: The students, after the completion of the course, are expected to….
CO1	Acquire knowledge on Internet of Things and its hardware and software components.
CO2	Demonstrate to interface I/O devices, sensors & communication modules.
CO3	Analyze by connecting and exchanging data with other devices and systems over the Internet.
CO4	Analyze to remotely monitor data and control devices.
CO5	Analyze the issues involved in the design of IoT application in terms of performance, efficiency and response time.
CO6	Develop real life IoT based projects.

20CS313- Aptitude and Coding Skills I

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Develop vocabulary for effective communication and reading skills
CO2	Build the logical reasoning and quantitative skills.
CO3	Develop error correction and debugging skills in programming.

20MA402- Probability and Random Processes

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Understand the fundamental knowledge of modern probability theory and standard distributions.
CO2	Categorize the probability models and function of random variables based on one and two dimensional random variables.
CO3	Demonstrate and apply the classification of random processes in engineering disciplines.
CO4	Apply the concepts of correlation functions and spectral densities.
CO5	Analyze the response of random inputs to linear time invariant systems.

20EC401- Communication Theory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Compare different Amplitude Modulation Schemes for their efficiency and bandwidth
CO2	Summarize the concepts of Angle Modulation Systems
CO3	Explain different types of Noise in Communication Systems
CO4	Analyze the behavior of Communication system in presence of noise
CO5	Summarize the principles of Sampling and quantization
CO6	Describe the Concepts of Pulse modulation Techniques

20EC402- Microprocessors and Microcontrollers

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Acquire knowledge on the architecture of 8086 microprocessor and 8051 microcontroller.
CO2	Apply programming techniques in developing the assembly language program for microprocessor applications.
CO3	Apply programming techniques in developing the assembly language program for microcontroller applications.
CO4	Analyze various types of interfacing devices with other peripheral devices.
CO5	Design and Construct Memory Interfacing Circuits.
CO6	Design and construct Microprocessor and Microcontroller based systems.

20EC403- Electromagnetic Fields

Cos	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Demonstrate the understanding of three-dimensional coordinate systems.
CO2	Analyze fields and potentials due to static charges.
CO3	Analyze static magnetic fields.
CO4	Interpret Maxwell's equations in integral, differential and phasor forms and explain their physical meaning.
CO5	Explain electromagnetic wave propagation in lossless and lossy media.
CO6	Solve simple problems requiring estimation of electric and magnetic field quantities based on the above concepts.

20EC404- Linear Integrated Circuits

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Describe the significance and applications of Integrated Circuits.
CO2	Demonstrate various Mathematical Circuit applications using IC 741.
CO3	Classify and comprehend the working principle of Data Converters.
CO4	Apply the Analog Multiplier and Phase Locked Loop for recent applications.
CO5	Design Waveform Generators using Op-amp circuits and analyze IC 555 Timers.
CO6	Demonstrate the use of IC regulators and Low dropout regulators for voltage regulation applications.

20GE301- Universal Human values 2: Understanding Harmony

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Would become more aware of themselves, and their surroundings (family, society, nature);
CO2	Would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.
CO3	Would have better critical ability.
CO4	Would become sensitive to their commitment towards what they have understood (human values, human relationship and human society).
CO5	Would be able to 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.

Practical

20EC411- Microprocessors and Microcontrollers Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Write ALP Programs for Arithmetic and logical operations.
CO2	Analyze to interface different I/Os with processor.
CO3	Analyze waveforms using Microprocessors.
CO4	Write programs in 8051.
CO5	Demonstrate to interface different I/Os with Microcontroller
CO6	Demonstrate to perform serial communications between two kits.

20EC412- Linear Integrated Circuits Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Analyze operational amplifiers in linear and nonlinear applications.
CO2	Design Amplifiers, Oscillators, D-A converters using Operational Amplifiers.
CO3	Design Filters using Op-Amp and performs an experiment on frequency response.
CO4	Design Voltage Regulators and DC power supply using ICs.
CO5	Analyze the performance of Filters using PSPICE.
CO6	Analyze the performance of Multivibrators using PSPICE.

20CS414- Aptitude and coding skills – II

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Develop advanced vocabulary for effective communication and reading skills
CO2	Build an enhanced level of logical reasoning and quantitative skills.
CO3	Develop error correction and debugging skills in programming.
CO4	Apply data structures and algorithms in problem solving.

20EC413-MINI PROJECT AND INDUSTRIAL INTERNSHIP

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Solve the real time problems using hardware, software, Computational tools.
CO2	Integrate software and the assembled components in the designed PCB.
CO3	Summarize the knowledge inferred through technical report.
CO4	Communicate a practical understanding of how a business organization actually operates
C05	Exhibit the ability to effectively work in a professional environment and demonstrate work ethic and commitment in a work-based environment.
CO6	Reflect on personal and professional development needs and set strategic goals for advancing along an intended career path

Fifth Semester

EC8501 - Digital Communication

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Learn the basic concepts of Information theory and source coding techniques for Communication Systems.
CO2	Understand and compare different waveform coding schemes.
CO3	Analyse the principles involved in Baseband signal Transmission and Reception
CO4	Compare différent digital modulation schemes and design of non-coherent receivers.
CO5	Interpret the knowledge on channel coding.
CO6	Learn and relate different error control coding schèmes.

EC8553 - Discrete-Time Signal Processing

COs	Course Outcome : The students, after the completion of the course, are expected to ….
CO1	Analyze the discrete time systems, linear and circular convolutions.
CO2	Apply DFT & FFT to analyze discrete time signal.
CO3	Design IIR filter by impulse invariance and bilinear transformation technique.
CO4	Construct FIR filter and develop the windowing technique.
CO5	Examine the finite word length effects and minimize the quantization errors.
CO6	Remember the applications of the DSP

EC8552 - Computer Architecture and Organization

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Describe the basic organization of modern computer systems.
CO2	Implement fixed and floating point arithmetic operations in computer architecture.
CO3	Illustrate pipelined control units.
CO4	Summarize the performance of memory systems.
CO5	Understand the parallel processing technique
CO6	Summarize the multiprocessors technique

EC8551 - Communication Networks

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	To classify the components required to build different types of networks
CO2	To illustrate the functionality of Media Access and Internetwork
CO3	To summarize the various Routing Mechanism
CO4	To explain the overview of Transport Layer and its Application requirements
CO5	To study about the flow control and congestion control
CO6	To describe the Traditional Application Layer.

EC8073 - Medical Electronics

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Discuss the characteristics of the bioelectric signals
CO2	Describe the measurement techniques for various non electrical parameters.
CO3	Illustrate the working of human assist devices
CO4	Discuss the operation of diathermy equipment.
CO5	Describe the principle of Bio -Telemetry.
CO6	Explain the recent trends in diagnosis & Therapy

OMD551- Basic of Bio Medical Instrumentation

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Study about the different bio potential and its propagation
CO2	Understand the different types of electrodes and its placement for various recording
CO3	Study about the different bio signal characteristics and electrode configuration
CO4	Study the design of bio amplifier for various physiological recording
CO5	Learn the different measurement techniques for non-physiological parameters.
CO6	Familiarize the different biochemical measurements.

Practical

EC8562 - Digital Signal Processing Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Carryout basic signal processing operations
CO2	Design and Implement the FIR and IIR Filters using MATLAB
CO3	Demonstrate their abilities towards MATLAB based implementation of various DSP systems
CO4	Analyze the architecture of a DSP Processor
CO5	Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals
CO6	Design a DSP system for various applications of DSP

EC8561 -Communication Systems Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	To visualize the effects of sampling and TDM
CO2	To Implement AM & FM modulation and demodulation
CO3	Simulate end-to-end Communication Lin
CO4	Demonstrate their knowledge in base band signaling schemes through implementation FSK, PSK and DPSK
CO5	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system
CO6	Simulate & validate the various functional modules of a communication system

EC8563 -Communication Networks Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Establishing communication between computers
CO2	Implementing various networking protocols and establishing connection between computers
CO3	Program a network using sockets and exchange information
CO4	Implementing various routing protocols and maintaining a secure data transfer
CO5	Summarize and compare various routing protocols
CO6	Simulate various types of topologies and understanding the differences between them.

EC8691- Microprocessors & Microcontrollers

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	To discuss the architecture of 8086 microprocessor and acquire skills in 8086 Programming.
CO2	To design the system using 8086
CO3	To classify the various interfacing techniques with 8086
CO4	To discuss the architecture of 8051 microcontroller
CO5	To program various devices using 8051
CO6	To interface the various devices using 8051

EC8095- VLSI Design

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Realize the concepts of digital building blocks using MOS transistor.
CO2	Design combinational MOS circuits and power strategies.
CO3	Design and construct Sequential Circuits and Timing systems.
CO4	Design arithmetic building blocks and memory subsystems.
CO5	Apply and implement FPGA design flow.
CO6	Apply the design techniques for testability and manufacturability.

EC8652- Wireless Communication

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Define a wireless channel
CO2	Explain the concepts of cellular system
CO3	Classify multiple access techniques
CO4	Design and implement various signaling schemes for fading channel
CO5	Compare multipath mitigation techniques and analyze their performance
CO6	Discuss various multiple antenna techniques

MG8591- Principles of Management

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Explaining the basic principles, concepts, evolution of management thinking, the role of managers and different types of organization.
CO2	Apply knowledge on Planning tools and techniques. Discuss the stages in decision making process and explain the types of strategies in order to make rational decisions.
CO3	Illustrate the concepts of organizing and its steps of an organization.
CO4	Assess and compare different leadership styles and select appropriate style for an organization and explain various theories of motivation
CO5	Explain the process of controlling and various controlling techniques
CO6	Illustrate the use of computers and IT in management to control productivity and management problems. Interpret the advantage of Reporting.

EC8651- Transmission Lines & RF Systems

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Discuss the various types of transmission lines and propagation of signals.
CO2	Examine signal propagation at Radio frequencies
CO3	Implement different methods of impedance matching
CO4	Analyze the field components in guided systems
CO5	Explain the RF system design Concepts.
CO6	Analyze the RF amplifier power and stability considerations

EC8002- Multimedia Compression & Communication

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Design audio compression techniques
CO2	Configure image compression techniques
CO3	Configure video compression techniques
CO4	Configure text compression techniques
CO5	Select suitable service model for specific application
CO6	Configure multimedia communication network

Practical

EC8681- Microprocessors & Microcontrollers Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Experiment with 8086 Microprocessor to write ALP for basic Arithmetic , Logical, fixed, floating Point, Code Conversion and String operations
CO2	Experiment with 8086 Microprocessor to display System date, Size , Time Delay and Password checking.
CO3	Make use of Interfacing Kits with processor for applications like stepper motor, Traffic light controller etc
CO4	Utilize interfacing Kits with processor to generate waveforms, A/D ,D/A and I/Os operations
CO5	Experiment with 8051 Microcontroller to write ALP for basic Arithmetic, Logical and Code Conversion
CO6	Make use of 8086 processor to Count Number of Odd and Even Numbers and also find LCM of two 8 Bit numbers

EC8661- VLSI Design Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Recall the basics of Verilog language
CO2	Develop HDL code for basic as well as advanced digital integrated circuits
CO3	Model NAND, NOR and Inverter using Micro wind layout design
CO4	Plan to place and route the logic modules
CO5	Design and simulation of analog IC blocks using EDA tool
CO6	Layout Extraction of analog IC blocks using EDA tool

EC8611- Technical Seminar

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Understand the Listening and responding appropriately
CO2	Make effective presentations
CO3	Make effective interpretations
CO4	Participate confidently in conversations
CO5	Participate appropriately in conversations
CO6	Manage time efficiently

HS8581- Professional Communication

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Understand the Listening and responding appropriately
CO2	Participate in group discussions
CO3	Make effective presentations
CO4	Participate confidently and appropriately in conversations both formal and informal
CO5	Attend job interviews and be successful in them
CO6	Develop adequate Soft Skills required for the workplace

EC8701-Antennas and Microwave Engineering

Cos	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Apply the basic principles and evaluate antenna parameters and link power budgets
CO2	Compare the radiation mechanisms of wire and loop antennas
CO3	Design and assess the performance of aperture and frequency independent antennas
CO4	Distinguish the radiation pattern of end fire and broad side arrays
CO5	Describe the working principle of active and passive microwave components
CO6	Design a microwave system given the application specifications

EC8751 -Optical Communication

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Describe basic elements in optical fibers, different modes and configurations
CO2	Summarize the transmission characteristics associated with dispersion and polarization techniques
CO3	Discuss the Characteristics of various fiber optical sources and detectors
CO4	Explain fiber optic receiver systems, measurements and coupling techniques
CO5	Realize optical communication systems and its networks
CO6	Compare the performance of optical networks

EC8791 -Embedded and Real Time Systems

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Interpret the concepts of embedded system design and analysis.
CO2	Develop the application programs with the knowledge of ARM Processor Architecture
CO3	Analyze the performance and optimization techniques of embedded programming components.
CO4	Apply the basic concepts of Real Time System for Embedded system design
CO5	Evaluate the Real time operating system performance and power optimization strategies for embedded system process
CO6	Model embedded system applications using ARM Processor and RTOS Concepts.

EC8702 –Adhoc and Wireless sensor Network

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Know the basics of Ad hoc networks and Wireless Sensor Network
CO2	Apply this knowledge to identify the suitable routing algorithm based on the network and user requirement
CO3	Apply the knowledge to identify appropriate physical and MAC layer protocols
CO4	Understand the transport layer and security issues possible in Ad hoc and sensor networks
CO5	Be familiar with the OS used in Wireless Sensor Networks and build basic modules
CO6	Understand the sensor network simulation platforms and tools

EC8071- Cognitive Radio

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Explain the concepts of software defined radios
CO2	Describe the Principles of self aware cognitive radios
CO3	Compare various approaches for optimizing radio resources
CO4	Classify the various networking techniques for cognitive radio
CO5	Illustrate various security issues in cognitive radio
CO6	Explain the role of cognitive radio in next generation applications

OIC751 –Transducer Engineering

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Apply the mathematical knowledge and science & engineering fundamentals gained to solve problems pertaining to measurement applications
CO2	Select the right transducer for a given application
CO3	Analyze the static and dynamic characteristics of transducers
CO4	Demonstrate different types of resistive transducers and their application areas
CO5	Explain different types of capacitive and inductive transducers
CO6	Explain Piezoelectric, Hall effect, Magneto elastic, MEMS and Smart transducers

Practical

EC8711- Embedded Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Write programs in ARM for a specific Application
CO2	Interface memory and write programs related to memory operations
CO3	Interface A/D and D/A convertors with ARM system
CO4	Analyze the performance of interrupt
CO5	Write programs for interfacing keyboard, display, motor and sensor.
CO6	Formulate a mini project using embedded system

EC8761 –Advanced Communication Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Analyze the performance of simple optical link by measurement of losses
CO2	Analyze the mode characteristics of fiber
CO3	Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER
CO4	Estimate the Characteristics of wireless channel
CO5	Analyze the performance of Wireless Communication System
CO6	Understand the intricacies in Microwave System design

EC8094- Satellite Communication

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Understand the satellite orbits and its trajectories with the definitions of parameters associated with it.
CO2	Understand principle, working and operation of various sub systems of satellite as well as the earth stations.
CO3	Analyse and design satellite communication link
CO4	Apply various communication techniques for satellite applications
CO5	Learn advanced techniques and regulatory aspects of satellite communication
CO6	Understand role of satellite in various applications

GE8076 –Professional Ethics in Engineering

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Create awareness on human values and apply ethics in society
CO2	Identify an ethical issue and assess variety of moral issues using ethical theories in engineering.
CO3	Analyze engineering, social experimentation and engineers as responsible experimenters
CO4	Realize engineers' safety and their responsibilities, professional rights, employee rights, and intellectual property rights.
CO5	Interpret various types of ethics like business ethics, environmental ethics and computer ethics.
CO6	Take part an engineers as managers, consulting engineers, engineers as expert witness and advisors

Practical

EC6811- Project Work

COs	Course Outcome: The students, after the completion of the course, are expected to ….
CO1	Analyze the various factors and techniques currently in use in their respective field of study
CO2	Evaluate a new and border field of engineering not restricted by any boundary
CO3	Develop their ability to solve their specific problem right from its identification
CO4	Study about different literature reviews till the successful solutions
CO5	Appraise the solution by formulating proper methodology related to the problem
CO6	Simplify the challenging engineering practical problems in real world