

R.M.K. ENGINEERING COLLEGE

RSM Nagar, Kavaraipeetai – 601 206

Department of Electronics and Communication Engineering

Course Outcomes – ODD-EVEN Semester 2020-21

Sl. No.	Semester	Theory/Practical	Course Code / Course Name
1.	3	Theory	MA8352 -Linear Algebra and Partial Differential Equations
2.	3	Theory	EC8393 -Fundamentals of Data Structures In C
3.	3	Theory	EC8351 -Electronic Circuits- I
4.	3	Theory	EC8352 -Signals and Systems
5.	3	Theory	EC8392 -Digital Electronics
6.	3	Theory	EC8391-Control Systems Engineering
7.	3	Practical	EC8381-Fundamentals of Data Structures in C Laboratory
8.	3	Practical	EC8361-Analog and Digital Circuits Laboratory
9.	3	Practical	HS8381-Interpersonal Skills / Listening & Speaking
10.	4	Theory	MA8451- Probability and Random Processes
11.	4	Theory	EC8452- Electronic Circuits II
12.	4	Theory	EC8491- Communication Theory
13.	4	Theory	EC8451- Electromagnetic Fields
14.	4	Theory	EC8453- Linear Integrated Circuits
15.	4	Theory	GE8291- Environmental Science & Engineering
16.	4	Practical	EC8461- Circuit Design & Simulation Laboratory
17.	4	Practical	EC8462- Linear Integrated Circuits Laboratory
18.	5	Theory	EC8501 - Digital Communication
19.	5	Theory	EC8553 - Discrete-Time Signal Processing
20.	5	Theory	EC8552 - Computer Architecture and Organization
21.	5	Theory	EC8551 - Communication Networks
22.	5	Theory	EC8073 - Medical Electronics
23.	5	Theory	OMD551- Bio Medical Instrumentation
24.	5	Practical	EC8562 - Digital Signal Processing Laboratory
25.	5	Practical	EC8561 -Communication Systems Laboratory
26.	5	Practical	EC8563 -Communication Networks Laboratory
27.	6	Theory	EC8691- Microprocessors & Microcontrollers
28.	6	Theory	EC8095- VLSI Design
29.	6	Theory	EC8652- Wireless Communication
30.	6	Theory	MG8591- Principles of Management
31.	6	Theory	EC8651- Transmission Lines & RF Systems
32.	6	Theory	EC8002- Multimedia Compression & Communication
33.	6	Practical	EC8681- Microprocessors & Microcontrollers Laboratory
34.	6	Practical	EC8661- VLSI Design Laboratory
35.	6	Practical	EC8611- Technical Seminar
36.	6	Practical	HS8581- Professional Communication
37.	7	Theory	EC8701 Antennas and Microwave Engineering
38.	7	Theory	EC8751 -Optical Communication

39.	7	Theory	EC6791 -Embedded and Real Time Systems
40.	7	Theory	EC8702- Ad hoc and Wireless sensor Network
41.	7	Theory	EC8071 -Cognitive Radio
42.	7	Practical	OIC751- Transducer Engineering
43.	7	Practical	EC8711 -Embedded Laboratory
44.	7	Theory	EC8761- Advanced Communication Laboratory

Third Semester (Academic Year 2020-21)

MA8352 - Linear Algebra and Partial Differential Equations

COs	Course Outcome: The students, after the completion of the course, are expected to
CO1	Understanding the basic notions associated with vector spaces and its properties.
CO2	Discuss the concept of linear transformation , eigenvalues and eigenvectors of a matrix
CO3	Relate the concept of inner product space in orthogonalization..
CO4	Understanding the fundamental concepts of partial differential equations and the various solution procedures for solving the first order non-linear partial differential equations.
CO5	Utilize the Fourier series problems in current flow, sound waves
CO6	Able to formulate and solve the physical problems of engineering.

EC8393 - Fundamentals of Data Structures In C

COs	Course Outcome: The students, after the completion of the course, are expected to....
CO1	Understand the basic features of C Programming and their applications
CO2	Enumerate the structured data types and dynamic memory objects and apply for real world scenario
CO3	Implement various linear data structures operations in C
CO4	Implement various non linear data structures operations in C
CO5	Analyze the various searching and sorting algorithms and appropriately choose it for an given real world scenario

CO6	Analyze a hash table and overflow handling
------------	--

EC8351 - Electronic Circuits- I

COs	Course Outcome: The students, after the completion of the course, are expected to....
CO1	Design the amplifier circuits using various biasing methods.
CO2	Analyze the single stage and multistage BJT amplifiers using small signal equivalent model.
CO3	Analyze JFET amplifiers using small signal equivalent model.
CO4	Analyze MOSFET amplifiers using small signal equivalent model.
CO5	Determine the frequency response of single stage and multistage amplifiers.
CO6	Design and fault analyze dc power supplies.

EC8352 – Signals & Systems

COs	Course Outcome: The students, after the completion of the course, are expected to....
CO1	Examine the operation of signals.
CO2	Analyze the Continuous time signals using Transforms
CO3	Examine the Continuous time LTI systems using Transforms
CO4	Illustrate the effect of aliasing through Baseband sampling theorem
CO5	Analyze the Discrete time signals using Transforms
CO6	Demonstrate the Discrete time LTI systems using Transforms

EC8392 – Digital Electronics

COs	Course Outcome: The students, after the completion of the course, are expected to....
CO1	Analyze different types of digital electronic circuit using various mapping and logical tools and know the techniques to prepare the most simplified circuit using various mapping and mathematical methods.
CO2	Design various combinational digital circuits using logic gates
CO3	Perform the analysis and design of synchronous sequential circuits
CO4	Perform the analysis and design of asynchronous sequential circuits
CO5	Assess the nomenclature and technology in the area of memory devices and apply the memory devices in different types of digital circuits for real world application.
CO6	Analyze the electronic circuits involved in the design of logic gates

EC8391 – Control Systems Engineering

COs	Course Outcome: The students, after the completion of the course, are expected to....
CO1	Distinguish various mathematical modeling of physical systems
CO2	Perform time domain analysis and its compensation technique required to stabilize control system
CO3	Perform frequency domain analysis and its compensation technique required to stabilize control system
CO4	Analyze the stability of the control system using various techniques
CO5	Perform the state variable analysis of the control system
CO6	Analyze the sampled data control system.

Practicals

EC8381- Fundamentals of Data Structures in C Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to.
CO1	To understand and implement basic data structures using C
CO2	To write basic and advanced programs in C
CO3	To apply linear and non-linear data structures in problem solving.
CO4	To learn to implement functions and recursive functions by means of data structures
CO5	To implement searching and sorting algorithms

EC8361 – Analog & Digital Circuits Laboratory

COs	Course Outcome: The students, after the completion of the course, are expected to
CO1	Design and test rectifiers , filters and regulated power supplies
CO2	Design and test digital logic circuits
CO3	Analyze various amplifiers using BJT and FET
CO4	Determine the differences between cascade and cascode amplifiers
CO5	Measure CMRR in a differential amplifier
CO6	Simulate and analyze analog and digital circuits using Pspice

HS8381-Interpersonal Skills / Listening & Speaking

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	Make effective interpretations

CO5	Participate confidently in conversations both formal and informal
CO6	Participate appropriately in conversations both formal and informal

Fourth Semester (Academic Year 2020-21)

MA8451- Probability and Random Processes

COs	Course Outcome: The students, after the completion of the course, are expected to
CO1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
CO2	Understand the basic concepts of one and two-dimensional random variables and apply in engineering applications.
CO3	Apply the concept random processes in engineering disciplines.
CO4	Understand and apply the concept of correlation and spectral densities.
CO5	Able to analyze the response of random inputs to linear time invariant systems.
CO6	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable.

EC8452- Electronic Circuits II

COs	Course Outcome: The students, after the completion of the course, are expected to
CO1	Analyze different types of amplifier with negative feedback
CO2	Design & Analysis of transistorized RC Oscillators & LC oscillators
CO3	Analyze transistorized tuned amplifiers

CO4	Analysis of wave shaping circuits
CO5	Design & Analysis of multivibrators
CO6	Summarize the operation of power amplifiers.

EC8491- Communication Theory

COs	Course Outcome: The students, after the completion of the course, are expected to
CO1	Discuss the principle concepts and the spectral characteristics of various amplitude modulation techniques.
CO2	Discuss the principle concepts and the spectral characteristics of various angle modulation techniques.
CO3	Interpret the properties and concepts of random process in the design of communication systems.
CO4	Demonstrate the performance of noise in AM and FM systems.
CO5	Gain knowledge in sampling and quantization.
CO6	Discuss the principle concepts of Pulse communication system.

EC8451- Electromagnetic Fields

Cos	Course Outcome: The students, after the completion of the course, are expected to
CO1	Explain the concept of field potentials due to static charges
CO2	How materials(Conductors, Dielectrics, etc...) affect electric fields
CO3	Explain the concept of field potentials due to magnetic fields

CO4	To understand wave propagation in lossless and in lossy media
CO5	Analyze the relation between the fields under time varying situations
CO6	Find the fundamental relations for time varying fields using Maxwell's Equations

EC8453- Linear Integrated Circuits

COs	Course Outcome: The students, after the completion of the course, are expected to
CO1	Describe the characteristics of operational amplifiers.
CO2	Design the various linear and non-linear applications of op-amp.
CO3	Apply the multiplier IC's and PLL in various applications
CO4	Compare the specifications of ADC and DAC.
CO5	Design oscillators and voltage regulators
CO6	Infer the applications of special function IC's.

GE8291- Environmental Science & Engineering

COs	Course Outcome: The students, after the completion of the course, are expected to
CO1	Definition, scope and importance of Risk and hazards
CO2	About the Concepts Of an ecosystem.
CO3	Explain the types of Natural Resources
CO4	Outline the Social Issues and the Environment.
CO5	Compare the Human Population and the Environment.
CO6	Role of information technology in environment and human health.

Practicals

EC8461- Circuit Design & Simulation Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Analyze various feedback amplifiers
CO2	Design oscillators and determine their frequency of operation
CO3	Construct tuned amplifiers and determine their resonant frequency
CO4	Design waveshaping circuits and observe their waveforms
CO5	Analyze multivibrator circuits and their output waveforms
CO6	Simulate feedback amplifiers, multivibrators and wave shaping circuits using SPICE tool and observe their outputs

EC8462- Linear Integrated Circuits Laboratory

COs	Course Outcome : The students, after the completion of the course, are expected to
CO1	Design Oscillators and Amplifiers using operational amplifiers
CO2	Design filters using OPAMP and perform experiment on frequency response
CO3	Analyze the working of PLL and use PLL as frequency multiplier
CO4	Design DC power supply using ICs
CO5	Analyze the performance of oscillators and multivibrators using PSPICE
CO6	Utilize PSPICE Software for circuit design

Fifth Semester (Academic Year 2020-21)

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 Réception
CO4	Compare different 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 equipments.
CO5	Describe the principle of Bio -Telemetry.
CO6	Explain the recent trends in diagnosis & Therapy

OMD551- 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.

Practicals

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.

Sixth Semester (Academic Year 2020-21)

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

Practicals

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 Microwind 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

Seventh Semester (Academic Year 2020-21)
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 Networks
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.

Practicals

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