T.J.S ENGINEERING COLLEGE

Approved by AICTE, New Delhi & Affiliated to Anna University, Chennai.

TJS Nagar, Peruvoyal, Near Kavaraipettai, Gummidipoondi Taluk, Thiruvallur District -601206

Department of Electronics and Communication Engineering

Course Outcomes – ODD-EVEN Semester 2018-19

Sl. No.	Semester	Theory/Practical	Course Code / Course Name
1	3	Theory	MA8352 -Linear Algebra and Partial Differential
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 CLaboratory
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	EC6501 - Digital Communication
19	5	Theory	EC6502 – Principles of Digital Signal Processing
20	5	Theory	EC6504- Microprocessors & Microcontrollers
21	5	Theory	EC6503- Transmission Lines and Wave Guides
22	5	Theory	GE6351- Environmental Science and Engineering
23	5	Practical	EC6511 - Digital Signal Processing Laboratory
24	5	Practical	EC6512 -Communication Systems Laboratory
25	5	Practical	EC6513- Microprocessors & Microcontrollers Laboratory
26	6	Theory	EC6601- VLSI Design
27	6	Theory	EC6602- Antenna and Wave Propagation
28	6	Theory	CS6551- Computer Networks
29	6	Theory	MG6591- Principles of Management
30	6	Theory	CS6303- Computer Architecture
31	6	Theory	EC6001- Medical Electronics
32	6	Practical	EC6611- Computer Networks Laboratory
33	6	Practical	EC6612- VLSI Design Laboratory
34	6	Practical	GE6674- Communication and Soft Skills Laboratory
35	7	Theory	EC6701-RF and Microwave Engineering
36	7	Theory	EC6702 -Optical Communication and Networks

39	7	Theory	EC6703 -Embedded and Real Time Systems
40	7	Theory	EC6004 – Satellite Communication
41	7	Theory	EC6009 – Advanced computer Architecture
42	7	Theory	EC6015 – Radar and Navigational Aids
43	7	Practical	EC6711- Embedded Laboratory
44	7	Practical	EC6712 -Optical and Microwave Laboratory
45	7	Theory	EC6801- Wireless Communication
46	8	Theory	EC6802 -Wireless Networks
47	8	Theory	GE6075 -Professional Ethics in Engineering
48	8	Theory	GE6757 -Total Quality Management
49	8	Practical	EC6811- Project Work

Third Semester (Academic Year 2018-19)

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
CO2	Discuss the concept of linear transformation , eigenvalues and eigenvectors of
CO3	Relate the concept of inner product space in orthogonalization..
CO4	Understanding the fundamental concepts of partial differential equations and
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
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
CO6	Analyze a hash table and overflow handling

EC8351 -Electronic Circuits- I

COs	Course Outcome: The students, after the completion of the course, are
CO1	**Design** the amplifier circuits using various biasing methods.
CO2	**Analyze** the single stage and multistage BJT amplifiers using small signal equivalent
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
CO1	Examine the operation of signals.
CO2	Analyze the Continuous time signals using Transforms
	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
	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
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
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
CO3	Perform frequency domain analysis and its compensation technique required
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
CO5	To implement searching and sorting algorithms

EC8361 – Analog & Digital Circuits Laboratory

COs	Course Outcome: The students, after the completion of the course, are
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 2018-19)
MA8451- Probability and Random Processes

COs	Course Outcome: The students, after the completion of the course, are
CO1	Understand the fundamental knowledge of the concepts of probability and
CO2	Understand the basic concepts of one and two-dimensional random variables
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

EC8452- Electronic Circuits II

COs	Course Outcome: The students, after the completion of the course, are
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
CO1	Discuss the principle concepts and the spectral characteristics of various
CO2	Discuss the principle concepts and the spectral characteristics of various angle
CO3	Interpret the properties and concepts of random process in the design of
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
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
CO5	Analyze the relation between the fields under time varying
CO6	Find the fundamental relations for time varying fields using

EC8453- Linear Integrated Circuits

COs	Course Outcome: The students, after the completion of the course, are
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
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
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

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 2018-19)

EC6501 - Digital Communication

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

EC6502- Principles of Digital Signal Processing

COs	Course Outcome : The students, after the completion of the course, are
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

GE6351- Environmental Science & Engineering

COs	Course Outcome: The students, after the completion of the course, are
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.

EC6503- Transmission Lines & Wave Guides

Cos	Course Outcome: The students, after the completion of the course, are
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

EC6504- Microprocessors & Microcontrollers

COs	Course Outcome: The students, after the completion of the course, are
CO1	To discuss the architecture of 8086 microprocessor and acquire skills in 8086
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

Practical

EC6511 - Digital Signal Processing Laboratory

COs	Course Outcome: The students, after the completion of the course, are
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
CO4	Analyze the architecture of a DSP Processor
CO5	Design and Implement the FIR and IIR Filters in DSP Processor for
CO6	Design a DSP system for various applications of DSP

EC6513- Microprocessors & Microcontrollers Laboratory

Cos	Course Outcome: The students, after the completion of the course, are
CO1	Experiment with 8086 Microprocessor to write ALP for basic Arithmetic ,
CO2	Experiment with 8086 Microprocessor to display System date, Size , Time
CO3	Make use of Interfacing Kits with processor for applications like stepper
CO4	Utilize interfacing Kits with processor to generate waveforms, A/D ,D/A and
CO5	Experiment with 8051 Microcontroller to write ALP for basic Arithmetic,

EC6512 -Communication Systems Laboratory

COs	Course Outcome: The students, after the completion of the course, are
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
CO5	Apply various channel coding schemes & demonstrate their capabilities
CO6	simulate & validate the various functional modules of a communication system

Sixth Semester (Academic Year 2018-19)

CS6303 - Computer Architecture

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

CS6551 – Computer Networks

COs	Course Outcome: The students, after the completion of the course, are
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.

EC6001 - 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

EC6601- VLSI Design

COs	Course Outcome: The students, after the completion of the course, are
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.

MG6591- Principles of Management

COs	Course Outcome: The students, after the completion of the course, are
CO1	Explaining the basic principles, concepts, evolution of management thinking,
CO2	Apply knowledge on Planning tools and techniques. Discuss the stages in
CO3	Illustrate the concepts of organizing and its steps of an organization.
CO4	Assess and compare different leadership styles and select appropriate style for
CO5	Explain the process of controlling and various controlling techniques
CO6	Illustrate the use of computers and IT in management to control productivity

Practical

EC6611 -Communication Networks Laboratory

COs	Course Outcome: The students, after the completion of the course, are
CO1	Establishing communication between computers
CO2	Implementing various networking protocols and establishing connection
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

EC6612- VLSI Design Laboratory

Cos	Course Outcome: The students, after the completion of the course, are
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

GE6674-Communication and Soft Skills Laboratory

Cos	Course Outcome: The students, after the completion of the course, are
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
CO5	Attend job interviews and be successful in them
CO6	Develop adequate Soft Skills required for the workplace

Seventh Semester (Academic Year 2018-19)

EC6701-RF and Microwave Engineering

Cos	Course Outcome: The students, after the completion of the course, are
CO1	Formulate Scattering parameters for 2 port RF Networks
CO2	Discuss RF Amplifier design and Perform Impedance matching
CO3	Classify microwave frequency range and Implement microwave components
CO4	Discuss microwave semiconductor devices
CO5	Examine mathematically the working principle of microwave conventional
CO6	Carry out the measurements at microwave frequencies

EC6702 -Optical Communication and Networks

Cos	Course Outcome: The students, after the completion of the course, are

CO1	Classify different elements of ray optics and discuss electromagnetic mode
CO2	Discuss the channel impairments in optical waveguides and examine coupling
CO3	Classify light sources and detectors
CO4	Examine optical receiver operation and differentiate different measurement
CO5	Describe basic optical networks
CO6	Outline on classification, performance of optical networks

EC6703 -Embedded and Real Time Systems

Cos	Course Outcome: The students, after the completion of the course, are
CO1	Define the Architecture and programming of ARM Processor.
CO2	Outline the Concepts Of real time embedded systems and computing platforms.
CO3	Explain the basics Of real time operating systems with examples and apply the
CO4	Build the System design techniques to develop software for embedded
CO5	Compare the several purpose operating system and real time operating system.
CO6	Design the various real time applications using system concepts.

EC6004 – Satellite Communication

Cos	Course Outcome: The students, after the completion of the course, are
CO1	Analyze the satellite orbits.
CO2	Analyze the earth segment.
CO3	Analyze the space segment.
CO4	Analyze various satellite access
CO5	Design various satellite applications
CO6	Analyze system noise of transmitter and receiver earth station.

EC6009 – Advanced Computer Architecture

COs	Course Outcome: The students, after the completion of the course, are
CO1	Evaluate performance of different architectures with respect to various parameters
CO2	Analyze performance of different ILP techniques
CO3	Design and anlayse pipelined control units
CO4	Evaluate performance of memory systems
CO5	Understand parallel processing architectures.
CO6	Identify cache and memory related issues in multi-processors

EC6015 – Radar and Navigational Aids

COs	Course Outcome: The students, after the completion of the course, are
CO1	To understand the principles of basic radar communication.
CO2	To apply Doppler principle to radars and hence detect moving targets, cluster, also to
CO3	To refresh principles of antennas and propagation as related to radars, also study of
CO4	To understand the principles of navigation.
CO5	To understand the concepts of landing aids as related to navigation.
CO6	To understand the concepts of satellite Navigation system.

Practicals

EC6711- Embedded Laboratory

COs	Course Outcome: The students, after the completion of the course, are
CO1	Develop the program in ARM for RGB led based applications
CO2	Interface memory and write program related to memory operation
CO3	Analyze the performance of wireless communication services
CO4	Develop program for interfacing keyboard display
CO5	Develop program for interfacing stepper motor
CO6	Formulate a mini project using embedded system

EC6712 -Optical and Microwave Laboratory

COs	Course Outcome: The students, after the completion of the course, are
CO1	Inspect the behaviour of various microwave components and devices
CO2	Estimate analog and digital link frequency response of an optical fiber cable
CO3	Examine the various connector and bending losses prevailing in an optical
CO4	Measure the characteristics of directional coupler, isolator ,circulator and
CO5	Test the radiation pattern and formulate the efficiency of microwave antenna
CO6	Discuss the DC characteristics of LED and Photo diode and calculate its

Eighth Semester (Academic Year 2018-19)

EC6801- Wireless Communication

COs	Course Outcome: The students, after the completion of the course, are
CO1	Explain the Characteristics of fading in wireless channels
CO2	Describe the fundamentals of Cellular Architecture
CO3	Use various signaling schemes for wireless communication channels
CO4	Compare the performance of channel using various propagation models
CO5	Analyze the various mitigation techniques to address fading and interference
CO6	Explain the Characteristics of fading in wireless channels

EC6802 -Wireless Networks

COs	Course Outcome: The students, after the completion of the course, are
CO1	Explain various standards and technologies in wireless LAN
CO2	Illustrate packet delivery and routing mechanism used in mobile network layer.
CO3	Compare traditional and classical TCP in mobile transport layer.
CO4	To explain overview of UTMS terrestrial radio access network.
CO5	To describe about 4G networks vision, features and challenges.
CO6	Summarize LTE networks, their architectures and the protocols involved.

GE6075 -Professional Ethics in Engineering

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

GE6757 -Total Quality Management

COs	Course Outcome: The students, after the completion of the course, are

CO1	Explain the customer care management systems
CO2	Apply the leadership qualities in management
CO3	Explain the Benchmark in manufacturing system
CO4	Execute the Quality Management principles using six sigma
CO5	Explain the ISO Auditing system
CO6	Explain the customer care management systems

Practicals

EC6811- Project Work

COs	Course Outcome: The students, after the completion of the course, are
CO1	Analyze the various factors and techniques currently in use in their respective
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
CO6	Simplify the challenging engineering practical problems in real world