RAAK

COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Pondicherry University)

An ISO 9001:2015 Certified Institution

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

SUBJECT WISE COURSE OUTCOME (2022 – 2023)

SUBJECT LIST

(2013 -2014)

S. No.	Course Code	Course Name
1.	T101	Mathematics - I
2.	T102	Physics
3.	T103	Chemistry
4.	T110	Basic Civil and Mechanical Engineering
5.	T111	Engineering Mechanics
6.	T112	Communicative English
7.	P104	Physics Laboratory
8.	P105	Chemistry Laboratory
9.	P106	Workshop Practice
10.	T107	Mathematics - II
11.	T108	Material Science
12.	T109	Environmental Science
13.	T104	Basic Electrical and Electronics Engineering
14.	T105	Engineering Thermodynamics
15.	T106	Computer Programming
16.	P101	Computer Programming Laboratory
17.	P102	Engineering Graphics
18.	P103	Basic Electrical and Electronics Laboratory
19.	P107	NSS/NCC
20.	MA T31	Mathematics - III
21.	EC T32	Electrical Engineering
22.	EC T33	Data Structures and object oriented programming
23.	EC T34	Electronic Devices and Circuits
24.	EC T35	Circuit Theory
25.	EC T36	Engineering Electromagnetics
26.	EC P31	Electrical Engineering Laboratory
27.	EC P32	Data Structures and object oriented programming Laboratory

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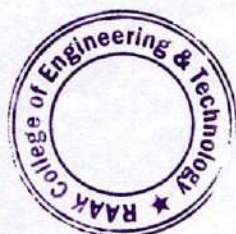Sulthanpet Post,
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28.	EC P33	Electronic Devices and Circuits Laboratory
29.	MA T41	Mathematics - IV
30.	EC T42	Electronic Circuit and Analysis
31.	EC T43	Signals and Systems
32.	EC T44	Linear and digital control system
33.	EC T45	Digital circuits
34.	EC T46	Electronic communication systems
35.	EC P41	Electronic circuit design laboratory
36.	EC P42	Digital circuits laboratory
37.	EC P43	Communication laboratory - I
38.	SP P44	Physical Education
39.	MA T51	Probability and Random Processes
40.	EC T52	Data Communication Network
41.	EC T53	Microprocessors and Microcontrollers
42.	EC T54	System design using integrated circuits
43.	EC T55	Transmission lines and wave guides
44.	EC E02	Consumer Electronics
45.	EC P51	Microprocessors and Microcontroller Laboratory
46.	EC P52	System design using integrated circuits Laboratory
47.	EC P53	Networks and Transmission Lines Laboratory
48.	HS P 54	General Proficiency - I
49.	EC T61	Digital Communication
50.	EC T62	Wireless communication
51.	EC T63	Digital Signal Processing
52.	EC T64	Antennas and wave propagation
53.	EC E06	VLSI design
54.	EC P61	Communication laboratory - II
55.	EC P62	Computer Networks laboratory
56.	EC P63	Digital Signal Processing laboratory
57.	HS PS4	General Proficiency – II
58.	EC T71	Microwave and Optical Engineering
59.	EC T72	Embedded Systems
60.	EC E14	Cryptography and Network Security
61.	EC E15	Spread Spectrum Communication
62.	EC P71	Communication laboratory – III
63.	EC P72	Embedded Systems laboratory
64.	EC P73	Seminar
65.	EC P74	Industrial Visit/Training
66.	EC PW7	Project Work - I

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67.	EC T81	Professional Ethics
68.	EC T82	Industrial Management and Engineering Economics
69.	EC E16	Satellite Communication systems
70.	EC E20	Cellular Mobile Communication
71.	EC P81	Advanced Communication Laboratory
72.	EC P82	Comprehensive Viva
73.	EC PW8	Project Work - II

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T101 Mathematics – I	
CO1	Apply knowledge of mathematics to solve functions of several variables
CO2	Identify, formulate and solve engineering problems like multiple integrals and their usage
CO3	To solve differential equation that model physical processes using effective mathematical tools
CO4	Able to find equation of straight line of shortest distance, equation of plane, angle between straight lines
CO5	Gain the knowledge to solve first order differential equation arising in engineering

T102 Physics	
CO1	Apply knowledge of science and engineering to understand physics and its significant contribution in the advancement of technology and invention of new products that dramatically transform modern day society
CO2	Identify different areas of physics which have direct relevance and application to different engineering disciplines
CO3	Apply fundamental knowledge to understanding applications of ultrasonics, optics and some optical devices, lasers and fiber optics, nuclear energy sources and wave mechanics
CO4	Understanding the basic operating principles of laser, its applications, optical fiber and its types, transmission characteristics, applications of optical fibers
CO5	Understanding the basic operating principles of laser, its applications, optical fiber and its types, transmission characteristics, applications of optical fibers

T103 Chemistry	
CO1	Apply knowledge of science and engineering to understand the importance of chemistry in engineering domain
CO2	Identify different electrochemical cells and their usage for industrial process
CO3	Apply fundamental knowledge of chemistry and build an interface of theoretical concepts with industrial applications engineering applications.
CO4	Guide the students to gain the knowledge about the cooling curves, phase diagrams, alloys and their practical importance

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CO5	Strengthen the fundamentals of chemistry and then build an interface of theoretical concepts with then industrial engineering applications

T110-Basic Civil and Mechanical Engineering

CO1	Understand the building classification as per National building code
CO2	Get the idea about construction procedure for various components of the building Students understand the principles of surveying, construction procedure for roads, bridges and dams
CO3	Student will be able know about the working of fraternal and external combustion Systems
CO4	Student will be able know about Non-Conventional Energy Systems
CO5	Student will be able to know about manufacturing process

T111-Engineering Mechanics

CO1	Understand the basics law of mechanics and resolution of forces using different methods
CO2	Learn and apply the knowledge on analysis of forces acting on the trusses and effect of friction force on bodies
CO3	Learn about the centroid and moment of inertia for plane and solid figures
CO4	Understand the three laws of motion, principles of dynamics for particles
CO5	Students will able to analyse the laws of motion for rigid bodies

T112-Communicative English

CO1	Learnt about the definition of communication, importance, concept. Sender, ideation, the levels in communication, channels, oral and return way of communication, body language and non- verbal communication, accuracy, brevity and clarity, difference barriers for communication, techniques in making effective communication, listening importance and types of listening
CO2	Students learnt about the types of letters, report writing, notices and memo and also develop the skill in writing
CO3	Understands the comprehension, identifies the difference between skimming and scanning, guess the meaning of the words, indentify to make notes.
CO4	Students learn the writing skills, how to write a paragraph in a proper manner four modes of writing and how to bibliographical entries
CO5	Students were able to develop their spoken skills by making many activities related to it

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P104 Physics Lab

CO1	Able to understand how to find the thickness of specimen and also to find the radius of curvature of glass using the phenomenon of two interference of light
CO2	Able to understand the specific rotary power of an optical active solution using the principle of polarization
CO3	Too understand about the thermal conductivity of bad conductor and rubber tube
CO4	Ability t understand about the optical properties like dispersive power, resolving power by applying the knowledge of optics

P105 – Chemistry Lab

CO1	Students will become well acquainted to test amount of hardness present in samples of water
CO2	Students will be efficient in estimating acidity/alkalinity in given samples
CO3	Students will have knowledge about estimating amount of dissolved oxygen in water
CO4	Students will become well acquainted to estimate copper in brass
CO5	Students will have knowledge about determination of viscosity of sucrose using Ostwald's viscometer
CO6	To develop an understand on chemicals

T107 Mathematics - II

CO1	Apply knowledge of mathematics to solve matrix algebra technique for practical applications and curl, divergence and integration of vectors in vector calculus
CO2	Identify, formulate and solve engineering problems like laplace transform and to solve differential and integral equations
CO3	Apply formulae and analyze problems of fourier transform techniques
CO4	Determine the fourier transform , Fourier cosine and sine transform of elementary functions, properties of transforms and its application in engineering
CO5	Acquire knowledge of matrix algebra techniques, vector calculus, laplace and Fourier Transform

T108 Material Science

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CO1	Apply core concept in material science to sole engineering problems
CO2	Knowledgeable of contemporary issues relevant to material science and engineering
CO3	Understand about ferrites and its application to magnetic materials
CO4	Select materials for design and construction
CO5	Understand the importance and properties of materials

T109 Environmental Science

CO1	Apply fundamental knowledge to understand about the environment
CO2	Identify environmental pollution through science
CO3	Apply basic knowledge to solve various environmental issues and problems
CO4	Ability to consider issues of environment and sustainable development in his personal and professional undertakings
CO5	Provide a comprehensive knowledge in environmental science, environmental issues and the management from an interdisciplinary perspective

T104 - Basic Electrical and Electronics Engineering

CO1	Will learn the fundamentals of rotational and stationary machine operation, single-phase and three-phase power measurement, magnetic and electrical circuits and these topics
CO2	Will learn the fundamentals of measuring devices, communication systems and networks models
CO3	Knowledge about non-conventional energy systems will be available to students
CO4	The varieties of metal joining will be known by the students
CO5	Students will learn about numerous engines, energies and joints as well construction and building components offered with diverse principles

T105 – Engineering Thermodynamics

CO1	Apply knowledge of mathematics, science and engineering to understand the basics of thermodynamics
CO2	Understand the importance of laws of thermodynamics applied to energy systems
CO3	Understanding refrigeration, heat pump and their physical mechanism
CO4	Understand the laws of motion for rigid bodies
CO5	Understand the effects of forces acting on the bodies in practical situation

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T106 – Computer Programming

CO1	Know concepts in problem solving
CO2	To do programming in C language
CO3	To write diversified solutions using the C language
CO4	To know about structures, pointers and its manipulations
CO5	To know about the evaluation of computers, components and its applications. Basic knowledge on the internet, information technology, word processing and worksheets.

P101– Computer Programming laboratory

CO1	Students can work with command line interface OS's like MS-Dos
CO2	Students can solve most of the real time problems with C Program
CO3	Students can interact with computer using C program, through various input and output functions.
CO4	Students can make a use of various keywords constants, variables, data types operators, type conversion in C programs.
CO5	Students will have knowledge about arrays functions structures and pointers in C Program.

P102-Engineering Graphics

CO1	Perform freehand sketching of basic geometrical constructions and multiple views of objects.
CO2	Project orthographic projections of lines and plane surfaces.
CO3	Draw projections and solids and development of surfaces.
CO4	Visualize and to project isometric and perspective sections of simple solids
CO5	Students will be able to draw orthographic projections and isomeric projections.

P103- Basic Electrical and electronics Laboratory

CO1	Know about basic electrical tools ,applications and precautions
CO2	Perform different types of wiring used in domestic and industrial applications
CO3	Measurements of voltage and phase using CRO, basic operations and applications of devices such as PN junction diode and transistors.
CO4	Understand the function and application of basic logic gates and flip flops
CO5	Gain knowledge in domestic wiring and application of electronics devices in the field of electrical engineering

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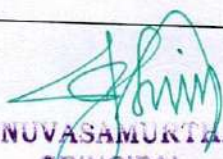Puducherry - 605 110

P103 – NSS/NCC

CO1	To create awareness in social and environmental issues
CO2	To participate in relief and rehabilitation work during natural calamities
CO3	To develop some proposals for local slum area development and waste disposal
CO4	To create team work among students and produce efficient results
CO5	To operate scientific instruments or advanced software

III –SEMESTER & SECOND YEAR

MA T31 – Mathematics – III

CO1	Familiarize with the concept of analytic function, C-R equations and its uses
CO2	Learn about Cauchy's theorem and its uses in complex integration. Taylor's and Laurent's series in complex form
CO3	Learn about Cauchy's Residues theorem and contour integrations
CO4	Gain knowledge of Finite and Infinite Fourier Transforms and applications
CO5	To introduce the route means fire value and parallel theorem on Fourier for practical applications

T32 – Electrical Engineering

CO1	Emphasis the basic concept of electromechanical energy conservation through energy and co energy
CO2	To know about the elementary concepts of rotating machines (DC generator)
CO3	To gain knowledge in the performance characteristics of DC motor
CO4	To understand the principles the equivalent circuit various characteristics and efficiency of Transformers
CO5	To gain knowledge in polyphase transformer ,special transformer and testing of various types of Transformers

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EC T33 – Data structures and object oriented programming

CO1	Discuss about programming principles and analyzing the problems and about types of arrays
CO2	To gain knowledge about linear data Structure, representation of stack, operation of stack and its application
CO3	To describe about the nonlinear data structures
CO4	To discuss about the structures oriented of objective programming with C++
CO5	To solve various computing problems using C++ languages

EC T34 – Electronic Devices and Circuits

CO1	Students are able to know basic of biasing and stabilization of transistor low and high frequency models
CO2	Able to design and analyze multistage amplifier and feedback amplifier
CO3	Student able to analyze and study the different types of oscillators and multivibrators
CO4	Student able to analyze and study the different types of wave amplifiers shaping circuits and time base generates
CO5	Students can able to design the basic electronic circuits and different types of

EC T35 – Circuit Theory

CO1	Understand the concept of embedded systems the importance of architecture revision in ARM processors and its impact on performance and features
CO2	Understand the sinusoidal steady-state response of RL, RC and RLC circuits including the calculation of currents and voltages
CO3	Understand the concept of transient response in circuits including natural and forced responses
CO4	Understand the concepts of self inductance and mutual inductance in circuits
CO5	Understand and construct the graph representation of a network which illustrate the connections between notes and branches

EC T36 – Engineering Electromagnetics

CO1	Gain proficiency in solving complex electromagnetic problems using analytical and numerical methods
CO2	Develop a thorough understanding of electric and magnetic fields, including Coulomb's law, Gauss's law, Ampère's law, and Faraday's law
CO3	Apply electromagnetic theory to real-world engineering problems, such as designing

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	circuits, communication systems, and understanding electromagnetic interference.
CO4	Learn to use vector calculus to describe electromagnetic fields and solve Maxwell's equations in both differential and integral forms.
CO5	Understand the generation, propagation, and reflection of electromagnetic waves, including concepts of waveguides, transmission lines, and antennas.

EC P31 – Electrical Engineering Laboratory

CO1	Knowledge on performance of DC shunt and series motor and on speed control behaviour of DC shunt motor
CO2	Knowledge on the characteristics of DC shunt generator on OC and load conditions
CO3	Knowledge on performance of single phase transformer
CO4	Knowledge on performance of synchronous machine
CO5	Knowledge on performance and speed control behaviour of an induction motor

EC P32 – Data Structures and Object Oriented Programming

CO1	To implement the linear and nonlinear data Structure concept in c languages
CO2	To implement and understand the object oriented programming concept in C++

EC P33 – Electronic Devices and Circuits Lab

CO1	Analyze the VI characteristics of the diode and transistor
CO2	Analysis the application of slipper and switching circuits

MA T41 – Mathematics - IV

CO1	Formulated solved partial differential equation
CO2	Derive and obtain the solution of wave equation and boundary value problems
CO3	Derive and obtain the solution of heat equation and boundary value problems
CO4	Apply least square method to fit various curves for the given data investigate the validity of hypothesis by z distribution techniques
CO5	Calculation of analysis of variance and explain the use of chi-squared test and its calculation

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EC T42 – Electronic Circuit and Analysis

CO1	Students are able to know basic of biasing and stabilization of transistor low and high frequency models
CO2	Able to design and analyze multistage amplifier and feedback amplifier
CO3	Student able to analyze and study the different types of oscillators and multivibrators
CO4	Student able to analyze and study the different types of wave shaping circuits and time base generates
CO5	Students can able to design the basic electronic circuits and different types of amplifiers

EC T43 – Signals and Systems

CO1	Apply knowledge of mathematics to understand the district time signals systems including their classification and properties
CO2	Identify formulate and solve engineering problems like frequency domain representation of continuous time signals and discrete time signals
CO3	Apply formula and salt problem in district time signals
CO4	Apply formula and solve problems in continuous time LTI system and display time LTI systems
CO5	The students will be able to do discrete fourier transform and finite Fourier transform analysis for any system

EC T44 – Linear Digital and Control System

CO1	Express a transnational and rotational mechanical system into its equivalent electrical system using free body diagrams and force –voltage, force- current, torque voltage and torque-current analogies. solve for the transfer function for a given block diagram using block diagram reduction techniques and Mason's gain formula
CO2	Determine the output response and time domain specification of first and second order closed loop system through Laplace transform method and apply the positional, integral and derivative controller for reducing the steady state errors and transient response of first and second order control systems
CO3	Synthesize the frequency response from the transfer function using bode plot and polar plot and analyses the stability of the given system
CO4	Diagnose the stability of a given system from its transfer function with the help of Routh-Hurwitz criteria and root locus techniques
CO5	To analyze model and design controller for linear dynamic system

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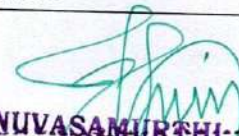| EC T45- Digital Circuits	
CO1	Understand the fundamentals of number systems
CO2	Understand the concepts of Boolean algebra, simplification of boolean function
CO3	Understand the concept of combinational logic design, programmable logic device
CO4	Conceptualize the working of sequential circuits synchronous sequential circuits
CO5	Gain the knowledge in different types of semiconductor memories

EC T46 – Electronics Communication Systems	
CO1	Understand the need for modulation in communication system and the advantages of using amplitude modulation over other modulation techniques.
CO2	Understand the principles of frequency modulation and face modulation in angle modulation
CO3	Understand the concept of additive white caution noise and its relevance in communication system analysis
CO4	Understand the basic principles of radar systems including the concept of transmission reflection and reception of electromagnetic waves.
CO5	Understand the fundamentals of television technology including the principles of image and sound transmission.

EC P41 Electronic Design Circuits Lab	
CO1	Ability to design the circuits in electronics like CE amplifiers FET amplifiers and filters.
CO2	Student can able to check the circuits like amplifiers and filter circuits etc using PSPICE

EC P42 Digital Circuits Lab	
CO1	Ability to understand and design the implementation of combination and sequential logic circuits
CO2	Student can able to check the circuits by using hardware kit and also by Modelsim software by using verilog HDL language

EC P43 Communication Laboratory - I	
CO1	Ability to understand and design the implementation of AM, FM, PWM, PPM, TDM
CO2	Student can able to check the circuits by using MATLAB software

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SP P44 Physical Education	
CO1	Understanding the opportunities of students physical, cognitive, social and emotional development
CO2	Understanding of individual and group motivation and behaviour
CO3	To create teamwork among students and produce efficient result
CO4	The students were taught to operate advanced playing kits
CO5	To motivate the students to prepare the professional and scientific reports

V – SEMESTER & THIRD YEAR

MA T51 – Probability and Random Processes	
CO1	Explain and illustrate the concept of discrete random variable and its probability distribution
CO2	Explain and illustrate the concept of continuous random variable and its probability distribution
CO3	Understand the concept of random process in both deterministic and non-determistic types
CO4	Familiar with Markov chain in discrete time with respect to state diagram, able to calculate transition probabilities
CO5	To expose the basic characteristics features of a queuing system and acquire skills in analysing queuing models

EC T52 – Data Communication Networks	
CO1	Apply knowledge of science and Engineering to understand and analyze different network models networking protocols, various network standards and architecture
CO2	Understand the data link control and medium access mechanism along with the types of error , Error detection and error correction strategies. Generate various non sinusoidal signals using multi vibrators and time base circuits
CO3	Able to identify, formulate and analyze IPV4 and IPV6 protocols and to understand various network routing protocols
CO4	Examine different transport protocol element, congestion control schemes and traffic management schemes for UDP and TCP
CO5	To make the students have dipped understanding and security aspects of data communication networks through different authentication protocols

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EC T53 – Microprocessors and Microcontrollers

CO1	Apply logical thinking to create assembly language programs and interfacing of peripheral devices
CO2	Apply fundamental knowledge of science and Engineering to understand architecture of microprocessor
CO3	To design and analyze microcontroller based system
CO4	To design and analyze peripheral interfaces
CO5	To design microcontroller based system

EC T54 – System Design using Integrated Circuits

CO1	To impact knowledge on linear IC operational amplifier IC 741 in designing various circuits in the field of electronics Engineering
CO2	Implement the different ICS like IC regulators IC 555 and PLL565 and its applications in the field of Engineering and the design concepts of analogue to digital and digital to analog converters
CO3	To understand the different digital integrated circuit families and its comparisons
CO4	Design system and demonstrate state diagram and state mission using synchronous and asynchronous sequential logic circuits
CO5	To understand the concept of processor and control unit with processor and its bus organization

EC T55- Transmission Lines and Waveguides

CO1	To understand about two port networks and to use them to analyze important two port networks like filters, attenuator, equalizer.
CO2	understand the concept of transmission lines and the losses associated with them and to use inductive loading to minimize the losses.
CO3	give thorough understanding about impedance transformation and matching and to use the Smith chart in problem solving.
CO4	study about the types of wave propagation between metallic planes, and to understand about the attenuation and wave velocity and wave length.
CO5	understand the wave propagation through cylindrical metallic surfaces and generate microwave signals through cavity resonators.

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EC EO2-Consumer Electronics	
CO1	Understand the working principles and characteristics of different types of loudspeakers and loudspeakers
CO2	Understand the structure and characteristics of composite video signals, including synchronization signals and color encoding,.
CO3	Understand the Principles and components involved in optical recording and reproduction system.
CO4	Understand the architecture and operation of Public Switched Telephone Networks (PSTN), including the roles of central offices Exchanges and subscriber lines.
CO5	Understand the basic principles of operation and block diagrams of microwave ovens, including the generation of microwaves, control systems, and safety features.

EC P51-Microprocess and microcontroller laboratory	
CO1	Ability to understand the logic of the program and execute the program in the Microprocessor Kit
CO2	Apply the knowledge of the program through Hardware in real time applications

EC P52 - System Design using Integrated Circuits Laboratory	
CO1	Study the operation, performance and applications of Op amp 741 by designing various circuits
CO2	To design the signal generators using IC 555 for defined time constant and analyze its performance

EC P53- Networks And Transmission Lines Laboratory	
CO1	Analyze the different types of two port network and study their characteristics
CO2	Study the properties of low frequency and high frequency transmission lines

HS P54 - General Proficiency – I	
CO1	To hone the communication and non-verbal skills of the students
CO2	To improve their Listening, Speaking, Reading and writing skills of students
CO3	To help the students to get rid of the inhibitions and communicate with ease.
CO4	To enhance the employability prospects of students

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CO5	To ensure the personality development of the students by sharpening their Soft skills

VI-SEMESTERS & THIRD YEAR

EC T61-Digital Communication

CO1	Apply fundamental knowledge of engineering to understand and analyze various filter receiver and basic type baseband modulated schemes.
CO2	Apply fundamental knowledge of engineering to understand and analyze various filter receiver and basic type Band pass modulation
CO3	Design and conduct experiments, as well as to analyze and interpret data about Spread spectrum technologies, frequency hopping and CDMA.
CO4	Apply fundamental knowledge of engineering to understand and analyze various filters, receivers and basic types of Base Band modulation schemes
CO5	Apply fundamental knowledge of engineering to understand and analyze various filters, receivers and basic types of Band Pass modulation

EC T62 - Wireless Communication

CO1	Understand the concepts of wireless communication using cellular environment.
CO2	Acquire knowledge on different program models and multi access techniques.
CO3	Analyze about diversity and equalizers.
CO4	Analyze the wireless network systems.
CO5	Understand various wireless network system.

EC T63-Digital Signal Processing

CO1	Analyzing The Classification Of Signals And Systems In The Time And Frequency Domains.
CO2	Perform The Stability Analysis Of Discrete Time System.
CO3	Acquire Knowledge On Spectral Analysis Of System.
CO4	Design Analyze And Compare Digital Filters For Processing Of Discrete Time Signals.
CO5	Acquire Knowledge On Dsp Architecture And Implement Dft And Fft Algorithms In Dsp.

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EC T64 - Antennas and Wave Propagation

CO1	Able to analyze the radiation characteristics of fundamental antennas like dipoles and monopoles. Able to understand the concepts of pattern multiplication and Array antennas.
CO2	Understand the radiation principles of aperture, slot and micro strip antenna and its application.
CO3	Understand the radiation principles of travelling wave, broadband antennas and its application.
CO4	Understand the radiation principles of special antennas and their application. Able to understand and apply different antenna measurement techniques
CO5	Learn factors influencing the propagation of radio waves, types of fading and diversity schemes.

EC E06- VLSI Design

CO1	Understand the principles and operation of MOS transistors in VLSI fabrication including NMOS, PMOS, CMOS, and Bi CMOS technologies
CO2	Understand the principles and design methodologies of combinational and sequential circuits.
CO3	Understand various circuit families used in digital subsystem design, including Dynamic CMOS logic, Domino CMOS logic and Pseudo NMOS lo'lic.
CO4	Understand the importance of testing in CMOS technology and the need for ensuring the reliability and functionality of integrated circuits
CO5	Understand the basics of Verilog hardware description language (HDL), including its syntax and structure.

EC P61- Communication Laboratory- IJ

CO1	Analyze the generation of various baseband and pass band modulation schemes and perform the time domain analysis.
CO2	Analyze the performance of various digital modulation schemes in terms of error rate and spectral efficiency using MATLAB.

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EC P62- Computer Networks Laboratory

CO1	Analyze the generation of traffic models of voice, data, video and ISDN model using MATLAB.
CO2	Analyze the performance of various encryption, decryption, flow control algorithms, error control algorithms, shortest routing algorithms using MATLAB.

EC P63-Digital Signal Processing Laboratory

CO1	Ability to model and analyze the DSP processing techniques using MATLAB.
CO2	Ability to model and analyze the DSP processing techniques using TI DSP processor kit.

HS P64 - General Proficiency – II

CO1	To develop the students' critical thinking and analytical skills
CO2	To help the students to equip themselves with the necessary skill sets.
CO3	To improve the students· problem solving skill
CO4	To help the students to prepare for interviews and face them with confidence.
CO5	To make a students industry read y and employable

VII-SEMESTER & FINAL YEAR

EC T71- Microwave And Optical Engineering

CO1	Apply fundamental knowledge of engineering to understand and analyze the principles, operation, performance, applications of various microwave tubes, semiconductor devices, to concept of S-parameter.
CO2	Apply fundamental knowledge of engineering to understand and analyze the concepts S-parameter.
CO3	Design, analyze various types of antenna and measure the light propagation, signal degradation in optical fibers.
CO4	Apply fundamental knowledge of engineering to understand and analyze the concepts optical sources, detectors and amplifiers.
CO5	Demonstrate the working principle of optical fiber link, WDM and optical network.

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EC T72	Embedded Systems
CO1	Understand the fundamental concepts of embedded systems and their design metrics.
CO2	Understand and utilize various C program elements including macros, functions, data types, structures, pointers, and function calls.
CO3	Understand the fundamental concepts of real-time systems, including issues specific to real-time computing.
CO4	Understand the importance of reliability evaluation in designing dependable systems.
CO5	Analyze architectural power minimization strategies focusing on architectural-level optimizations to reduce power consumption.

EC T83 - Spread Spectrum Communication	
CO1	analyze the basic concepts of spread spectrum technology
CO2	Acquire knowledge on different types of jamming techniques and how they improve performance for mobile radio channels
CO3	Characterize the trade-offs among difference spread spectrum techniques and identify the pros and cons.
CO4	Design and conduct experiments, as well as to analyze and interpret data about Spread spectrum technologies, frequency hopping and CDMA.
CO5	Understand the basic concept of applications.

EC E14- Cryptography And Network Security	
CO1	To understand the fundamental concepts of Security Services Attacks and Mechanisms
CO2	To comprehend the mathematical concepts related to Symmetric key Cryptography
CO3	To understand Public Key Cryptography and its types
CO4	To learn about different Authentication and Signature techniques
CO5	To understand the importance of Network Security

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EC P7I - Communication Laboratory- III

CO1	Ability to understand the Microwave Communication Engineering concepts and Students will get practical exposure in hi11.h frequencv hardware experiments.
CO2	Ability to understand the optical communication Engineering concepts using trainer kits.

EC P72- Embedded Systems Laboratory

CO1	Ability to understand the logic of the program and execute the program in the Software
CO2	Apply the knowledge of the program through Hardware in real lime applications

EC P73-seminar

CO1	An ability to write technical documents and give oral presentations related to the work completed and improve personality development and communication skills
CO2	Train the students to approach ethically any multidisciplinary engineering challenges with economic, environmental and social contexts and to set them for future recruitment by the potential employers .
CO3	Identify and apply appropriate well-rehearsed note-taking interactive and time management strategies to their academic studies.
CO4	Develop audience centered presentation meeting concrete professional objectives and integrating ethical and legal visual aids.
CO5	Identify and critically evaluate the quality of claims, explanation, support and delivery in public and professional discourse, understand the factors influencing a speakers, credibility.

EC P74 Industrial Visit/Training

CO1	Industrial visits provide an excellent opportunity to interact with industries and know more about industrial environment. Industrial visit helos to combine theoretical knowledge with industrial knowled2e
CO2	Industrial visit provides students with an opportunity to learn practically through interaction, working methods and employment practices

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ECPW7	Project Work-I
CO1	Select a suitable project making use of the technical and engineering knowledge gained from previous courses with the awareness impact of technology on the Society and their ethical responsibilities.
CO2	Collect and disseminate information related to selected project
CO3	Identify the modern tools required for the implementation of the project
CO4	Form a team and distribute the work among themselves.
CO5	Communicate technical and general information by means of oral as well as written presentation skills with professionalism.

VIII-SEMESTER & FINAL YEAR

EC T81-professional ethics	
CO1	Have a fundamental understanding of the objectives of ethics in engineering.
CO2	Apply the self ethically beliefs and those inside to the area of involvement.
CO3	Will be more responsible to the society, environment and to the involved area. Must stand for uplift of the country without seeking personal benefits.
CO4	Make assessment and knowledge on their right and duties in the specialized area.
CO5	Identify and classify threats and security issues to the environment and to country, and will stand as perfect leaders.

EC T82 - Industrial Management and Engineering Economics	
CO1	Understand the flow of goods, services, and resources in an economy
CO2	Understand various methods for comparing alternatives in engineering economic analysis
CO3	Understand the concept of depreciation and its importance in financial accounting and engineering economics.
CO4	Understanding the fundamental principles and areas of focus within the discipline of management
CO5	Understanding the distinction between fixed costs (expenses that do not change regardless of production or sales volume)

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EC E16- Satellite Communication Systems

CO1	Understand the basic concept of satellite communication.
CO2	Understand the basic concept and features of Satellite communication link design model and parameters to maintain the wireless networks.
CO3	Understand the basic of Satellite Access
CO4	Acquire knowledge on Laser Satellite Communication and link design model.
CO5	Acquire knowledge on various applications and services of Satellite Communication

EC E20 Cellular Mobile Communication

CO1	An introduction to the fundamentals of cellular communications and Characterizes the trade-off among frequency reuse, signal to interference ratio, capacity and spectral efficiency.
CO2	Acquire the knowledge of Handoff detection and Authentication for Roaming management with Radio link transfer and Assessment techniques.
CO3	Gain better understanding of GSM signaling, Services and its real time application and Voice over Internet Protocol.
CO4	To explore the students with the structure of various protocols involved in wireless communication Model, Gateway and Developer tool kits for mobile environment.
CO5	To understand the wireless communication systems and standards by various Wireless Techniques like Wireless Local Loon and different cellular Generations

EC PSI -Advanced Communication Laboratory

CO1	I Study the characteristics of microwave and optical link and analyze the spectrum of various band pass signal.
CO2	I Analyze the performance of various communication link in terms of error rate and spectral efficiency using MATLAB

EC P82 - Comprehensive Viva

CO1	Students understand the fundamentals of all the subjects studied in the entire program
CO2	Students gets ability to face interview both at the academic and the industrial sector

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EC PW8 - Project Phase II	
CO1	Define and complete the selected project making use of the technical and engineering knowledge which meets the expected outcome.
CO2	Work with the modem tools required for the implementation of the project.
CO3	Achieve the results within in the stipulated time
CO4	To well as written presentation skills with professionalism
CO5	Acquire problem solving system integration, project management documentation skills,

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