ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.E Electronics and Communication Engineering
Anna University Regulation 2013
List of Course Names

S.No.	Sem	Course code	Course	Course Title
1.	I	13C101	HS6151	Technical English-I
2.	I	13C102	MA6151	Mathematics-I
3.	I	13C103	PH6151	Engineering Physics-I
4.	I	13C104	CY6151	Engineering Chemistry-I
5.	I	13C105	GE6151	Computer Programming
6.	I	13C106	GE6152	Engineering Graphics
7.	I	13C107	GE6161	Computer Practices Laboratory
8.	I	13C108	GE6162	Engineering Practices Laboratory
9.	I	13C109	GE6163	Physics and Chemistry Laboratory - I
10.	II	13C110	HS6251	Technical English – II
11.	II	13C111	MA6251	Mathematics – II
12.	II	13C112	PH6251	Engineering Physics – II
13.	II	13C113	CY6251	Engineering Chemistry – II
14.	II	13C114	EC6201	Electronic Devices
15.	II	13C115	EE6201	Circuit Theory
16.	II	13C116	GE6262	Physics and Chemistry Laboratory - II
17.	II	13C117	EC6211	Circuits and Devices Laboratory
18.	III	13C201	MA6351	Transforms and Partial Differential Equations
19.	III	13C202	EE6352	Electrical Engineering and Instrumentation
20.	III	13C203	EC6301	Object Oriented Programming and Data Structures
21.	III	13C204	EC6302	Digital Electronics
22.	III	13C205	EC6303	Signals and Systems
23.	III	13C206	EC6304	Electronic Circuits- I

24.	III	13C207	EC6311	Analog and Digital Circuits Laboratory
25.	III	13C208	EC6312	OOPS and Data Structures Laboratory
26.	IV	13C209	MA6451	Probability and Random Processes
27.	IV	13C210	EC6401	Electronic Circuits II
28.	IV	13C211	EC6402	Communication Theory
29.	IV	13C212	EC6403	Electromagnetic Fields
30.	IV	13C213	EC6404	Linear Integrated Circuits
31.	IV	13C214	EC6405	Control System Engineering
32.	IV	13C215	EC6411	Circuit and Simulation Integrated Laboratory
33.	IV	13C216	EC6412	Linear Integrated Circuit Laboratory
34.	IV	13C217	EE6461	Electrical Engineering and Control System Laboratory
35.	V	13C301	EC6501	Digital Communication
36.	V	13C302	EC6502	Principles of Digital Signal Processing
37.	V	13C303	EC6503	Transmission Lines and Wave Guides
38.	V	13C304	GE6351	Environmental Science and Engineering
39.	V	13C305	EC6504	Microprocessor and Microcontroller
40.	V	13C306	EC6511	Digital Signal Processing Laboratory
41.	V	13C307	EC6512	Communication System Laboratory
42.	V	13C308	EC6513	Microprocessor and Microcontroller Laboratory
43.	VI	13C309	MG6851	Principles of Management
44.	VI	13C310	CS6303	Computer Architecture
45.	VI	13C311	CS6551	Computer Networks
46.	VI	13C312	EC6601	VLSI Design
47.	VI	13C313	EC6602	Antenna and Wave propagation
48.	VI	13C314(PE-I)	EC6001	Medical Electronics
49.	VI	13C315	EC6611	Computer Networks Laboratory
50.	VI	13C316	EC6612	VLSI Design Laboratory

51.	VI	13C317	GE6674	Communication and Soft Skills - Laboratory Based
52.	VII	13C401	EC6701	RF and Microwave Engineering
53.	VII	13C402	EC6702	Optical Communication and Networks
54.	VII	13C403	EC6703	Embedded and Real Time Systems
55.	VII	13C404 (PE-II)	IT6005	Digital Image Processing
56.	VII	13C405(PE-III)	EC6011	Electromagnetic Interference and Compatibility
57.	VII	13C406(PE-IV)	EC6016	Opto Electronic Devices
58.	VII	13C407	EC6711	Embedded Laboratory
59.	VII	13C408	EC6712	Optical and Microwave Laboratory
60.	VIII	13C409	EC6801	Wireless Communication
61.	VIII	13C410	EC6802	Wireless Networks
62.	VIII	13C411(PE-V)	CS6003	Adhoc and Sensor Networks
63.	VIII	13C412(PE-V)	EC6018	Multimedia Compression and Communication
64.	VIII	13C413(PE-VI)	CS6701	Cryptography and Network Security
65.	VIII	13C414 (PE-VI)	EC6019	Data Converters
66.	VIII	13C415	EC6811	Project Work

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B.E Electronics and Communication Engineering

Course Outcomes (CO)

13C101- HS8151 TECHNICAL ENGLISH-I

13C101.1	Develop the learners' basic communication skills in English by listening audios and long text
13C101.2	Explain technical things and develop instructions and recommendations
13C101.3	Summarize cohesively and coherently without grammatical errors, Organize the ideas logically on a topic
13C101.4	Interpret charts and graphs and illustrate different types of essays.
13C101.5	Apply the technical strategies in E-Learning and develop E- Communication Skills

13C102 –MA6151-MATHEMATICES-I

13C102.1	Apply the concept of orthogonal transformation to diagonalise the given matrix..
13C102.2	Apply the comparison test , Integral test, D' Alembert's ratio test and Leibnitz' s test to verify the convergence.
13C102.3	Find the radius of curvature, circle of curvature and Centre of curvature of a given curve.
13C102.4	Identify maxima and minima in two variables using partial differentiation.
13C102.5	Apply multiple integral techniques in evaluating Area and Volume of Solids

13C103-PH6151-ENGINEERING PHYSICS-I

13C103.1	Outline the various crystal structure and its growth techniques
13C103.2	Illustrate basic concepts of stress and strain in solids and one dimensional Heat transfer
13C103.3	Illustrate the quantum theory and its applications
13C103.4	Apply the knowledge of acoustics in designing buildings
13C103.5	Classify the type of optical fiber and Laser

13C104-CY6151-ENGINEERING CHEMISTRY-I

13C104.1	List the various methods involved in the polymerization techniques.
13C104.2	Apply the concepts of Thermodynamic laws in engineering applications.
13C104.3	Outline the molecular structure by using spectroscopic techniques.
13C104.4	Illustrate the basic concepts of phase rule for the purpose and significance of alloying.
13C104.5	Apply the basics of Nano materials and their properties in various applications.

13C105-GE6151-COMPUTER PROGRAMMING

13C105.1	Explain the Organization of a Computer and number systems.
13C105.2	Explain the attributes of algorithm and programming basics
13C105.3	Apply arrays and string functions in simple C programs
13C105.4	Explain functions and pointers for solving problems
13C105.5	Apply structure and union in simple C applications

13C106-GE6152-ENGINEERING GRAPHICS

13C106.1	Discuss the orthographic views of Engineering components.
13C106.2	Relate to basic principles of orthographic projection for drawing projection of points, lines and planes.
13C106.3	Apply basic principles of orthographic projection for drawing projection of solids like prisms, pyramids, cone and cylinder.
13C106.4	Show the sectioned view of solids and the development of solid surfaces
13C106.5	Show the isometric projection and perspective views for simple solids.

13C107-GE6161 COMPUTER PRATICE LABORATORY

13C107.1	Apply word processor to prepare data for presentation and visualization
13C107.2	Explain various formatting tools, types of tables, drawing tools and mail merging for effective documentation
13C107.3	Apply spread sheet to prepare data for presentation and visualization
13C107.4	Apply basic programs in C language in problem solving
13C107.5	Apply suitable data structures and functions in problem solving
13C107.6	Exhibit ethical principles in engineering practices
13C107.7	Perform task as an individual and/ or team member to manage the task in time
13C107.8	Express the engineering activities with effective presentation and report.
13C107.9	Interpret the findings with appropriate technological/ research citation

13C108-GE6162-ENGINEERING PRACTICES LABORATORY

13C108.1	Explain the various manufacturing process in smithy, foundry, fitting, assembling and disassembling and will be able to provide effective presentation.
13C108.2	Summarize the operations of various machine tools lathe , drilling
13C108.3	Develop models by using skills achieved from workshop sections like welding, carpentry, sheet metal and plumbing
13C108.4	Apply the skills of basic electrical engineering for domestic wiring practices
13C108.5	Apply the measuring instruments like energy meter and perform measurements in electrical circuits.
13C108.6	Explain the working of electronic components.
13C108.7	Apply the electronic principle for develop engineering circuits.

13C108.8	Exhibit ethical principles in engineering practices
13C108.9	Perform task as an individual and/ or team member to manage the task in time
13C108.10	Express the engineering activities with effective presentation and report.
13C108.11	Express the engineering activities with effective presentation and report.

13C109-BS8161-PHYICS AND CHEMISTRY LABORATORY

13C109.1	Find the wavelength and particle size using laser and thermal conductivity of bad conductors using Lee's Disc
13C109.2	Compare the Young's modulus of the material by non-uniform bending and the wavelength of mercury spectrum using Spectrometer grating both individually and by team work
13C109.3	List the velocity of ultrasonic waves in different liquids like water and kerosene
13C109.4	Estimate strength of acids quantitatively based on the conductance and PH level of the solution both individually and in teams
13C109.5	Estimate water quality parameters such as dissolved oxygen content, chloride content and iron content of the water samples both
13C109.6	Exhibit ethical principles in engineering practices
13C109.7	Perform task as an individual and/ or team member to manage the task in time
13C109.8	Express the engineering activities with effective presentation and report.
13C109.9	Interpret the findings with appropriate technological/ research citation

13C110-HS6251-TECHNICAL ENGLISH-II

13C110.1	Explain convincingly their opinions and also initiate, negotiate and argue using appropriate communicative strategies.
13C110.2	Apply the basic grammar techniques to enhance the language
13C110.3	Make use of the importance of writing skills and its techniques
13C110.4	Develop various types and formats of reports, emails, resumes, letters, to meet particular needs or purposes
13C110.5	Apply skills pertaining to presentation, group discussion, creative and critical thinking in everyday life

13C111-MA8251- MATHEMATICES-II

13C111.1	Solve the line integral, surface integral and volume integral in Engineering applications
13C111.2	Solve simultaneous first order linear equations with constant coefficients.
13C111.3	Solve the second order ODE by Laplace transformation.
13C111.4	Find the analytic functions by Milne Thomson method
13C111.5	Solve real definite integrals , contour integrals around unit circle and semi-circle

13C112-PH6251-ENGINEERING PHYSICS-II

13C112.1	Infer the electrical properties of material and quantum theory.
13C112.2	Classify the type of semiconductor and its uses.
13C112.3	Outline the magnetic properties of different materials and superconductivity.
13C112.4	Apply the knowledge of polarization in polaroid's
13C112.5	Interpret the metallic glasses, Nano Materials and Biomaterials

13C113-CY6251-ENGINEERING CHEMISTRY-II

13C113.1	Explain the concepts of various water treatment process.
13C113.2	Apply the principles of electrochemical reactions in prevention of materials from corrosion.
13C113.3	Explain the working of power plants using conventional and non-conventional sources of energy such as nuclear, solar and wind
13C113.4	Illustrate knowledge of metals for Engineering Applications
13C113.5	Explain various types of fuels, their manufacturing processes and calculation of calorific theoretically

13C114-EC6201-ELECTRONIC DEVICE

13C114.1	Explain the basic concept and operation of PN Junction Diode.
13C114.2	Explain the operation of Bipolar Junction Transistor in various configuration.
13C114.3	Explain the basic concept and operation of FET and MOSFET.
13C114.4	Explain the operation of various Special Semiconductor Devices.
13C114.5	Explain the operation of various power devices and display devices.

13C115-EE6201-CIRCUIT THEORY

13C115.1	Apply Kirchoff's law on DC and AC network.
13C115.2	Apply network theorems on DC & AC circuit.
13C115.3	Analyze the performance of resonance and coupled circuits.
13C115.4	Analyze the transient response of the DC circuit and characteristics of two port network.
13C115.5	Analyze the performance of three phase circuits

13C116-GE6262-PHYSICS AND CHEMISTRY LABORATORY-II

13C116.1	Find the particle size by diode laser .
13C116.2	List out the thermal conductivity of bad conductors .
13C116.3	Show the velocity of ultrasonic waves in different liquids like water and kerosene
13C116.4	Show the iron content of the given solution using potentiometer
13C116.5	Relate water quality parameters such as alkalinity, hardness, Sodium of the water samples both individually and in teams.
13C116.6	Exhibit ethical principles in engineering practices
13C116.7	Perform task as an individual and/ or team member to manage the task in time
13C116.8	Express the engineering activities with effective presentation and report.
13C116.9	Interpret the findings with appropriate technological/ research citation

13C117-EC6211-CIRCUITS AND DEVICES LABORATORY

13C117.1	Observe the characteristics of diodes and regulator using zener diode.
13C117.2	Demonstrate the input and output characteristics of BJT , FET and SCR
13C117.3	Construct the clipper, clamper & FWR circuits.
13C117.4	Demonstrate the circuits using KVL, KCL, Thevinin, Norton, Superposition, maximum power transfer and reciprocity theorems.
13C117.5	Illustrate the resonance frequency of series & parallel RLC Circuits and the transient response of RL and RC circuits.
13C117.6	Exhibit ethical principles in engineering practices
13C117.7	Perform task as an individual and/ or team member to manage the task in time
13C117.8	Express the engineering activities with effective presentation and report.
13C117.9	Interpret the findings with appropriate technological/ research citation

13C201-MA6351-TRANSFORMS AND PARTIAL DIFFERENTIAL EQUATIONS

13C201.1	Formulate simple Engineering problems as Partial Differential Equations
13C201.2	Apply the concept of Fourier series in solving boundary value problems
13C201.3	Solve the standard Partial Differential Equations in engineering problems like Wave equation, Heat flow equation by Fourier series.
13C201.4	Solve Fourier, Fourier Sine and Cosine transforms and properties
13C201.5	Understand the discrete transform applied to engineering problems.

13C202-EE6352-ELECTRICAL ENGINEERING AND INSTRUMENTATION

13C202.1	Analyze the performance of DC machines.
13C202.2	Analyze the performance of static AC machine
13C202.3	Analyze the performance of different types of AC machines
13C202.4	Discuss the concept of measuring instruments.
13C202.5	Discuss the concept of analog and digital instruments

13C203-EC6301-OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURES

13C203.1	Explain the fundamentals of object oriented programming, particularly in C++
13C203.2	Construct simple applications using C++
13C203.3	Utilize object oriented programming to implement data structures
13C203.4	Illustrate linear, non-linear data structure and their applications
13C203.5	Make use of different methods of organizing large amount of data

13C204-EC6302-DIGITAL ELECTRONICS

13C204.1	Explain the Use of digital electronics in the present contemporary world
13C204.2	Identify various types of combinational digital circuits
13C204.3	Construct synchronous sequential circuits using flip flops
13C204.4	Compare the semiconductor memories and related technologies.
13C204.5	Interpret asynchronous sequential circuits

13C205-EC6303-SIGNALS AND SYSTEMS

13C205.1	Classify the different types of continuous and discrete time signals and systems.
13C205.2	Apply Fourier series, Laplace transform & Fourier transform in continuous time signal .
13C205.3	Analyze continuous time LTI systems using Fourier and Laplace Transforms.
13C205.4	Apply Z transform and DTFT in discrete time signal .
13C205.5	Analyze discrete time LTI systems using Z transform and DTFT.

13C206-EC6304-ELECTRONIC CIRCUITS- I

13C206.1	Understand the working principles, Characteristics and Applications of BJT, FET and MOSFET.
13C206.2	Apply the hybrid pi parameters for the small analysis of various BJT Amplifiers
13C206.3	Apply the hybrid pi parameters for the small analysis of FET and MOSFET Amplifiers
13C206.4	Develop the high frequency model of BJT, FET and MOSFET amplifier circuits.
13C206.5	Explain the different stages of power supply modules.

13C207-EC6311-ANALOG AND DIGITAL CIRCUITS LABORATORY

13C207.1	Demonstrate the working of oscillators , amplifiers using operational amplifiers.
13C207.2	Demonstrate the performance characteristics of filters , Schmitt Trigger and multivibrators using op-amp .
13C207.3	Demonstrate the working of PLL and its application as frequency multiplier.
13C207.4	Demonstrate the working of DC power supply and multivibrators using timer.
13C207.5	Simulate amplifiers, filters, oscillators multivibrators, A/D converters, analog multipliers and CMOS Inverter, NAND and NOR using PSPICE
13C207.6	Exhibit ethical principles in engineering practices
13C207.7	Perform task as an individual and/ or team member to manage the task in time
13C207.8	Express the engineering activities with effective presentation and report.
13C207.9	Interpret the findings with appropriate technological/ research citation

13C208-EC6312-OOPS AND DATA STRUCTURES LABORATORY

13C208.1	Experiment with the basic programs in C++
13C208.2	Make use of array and link list to implement list ADT
13C208.3	Build the linear data structures using C++
13C208.4	Build the nonlinear data structures using C++
13C208.5	Make use of sorting & searching algorithm to increase the efficiency using C++ programming.
13C208.6	Exhibit ethical principles in engineering practices
13C208.7	Perform task as an individual and/ or team member to manage the task in time
13C208.8	Express the engineering activities with effective presentation and report.
13C208.9	Interpret the findings with appropriate technological/ research citation

13C209-MA6451-PROBABILITY AND RANDOM PROCESSES

13C209.1	Explain the basic knowledge of Probability and Distributions
13C209.2	Explain the fundamental knowledge of One and Two dimensional random variables
13C209.3	Categorize Discrete and Continuous processes
13C209.4	Apply the knowledge of correlation and spectral density in Engineering problems
13C209.5	Analyze linear time invariant system

13C210-EC6401-ELECTRONIC CIRCUITS II

13C210.1	Describe the concepts of feedback amplifiers.
13C210.2	Classify the various types of oscillators.
13C210.3	Analyze the different types of tuned amplifiers and its
13C210.4	Discuss various types of wave shaping circuits and multivibrators.
13C210.5	Explain the blocking oscillator and time base generator circuits.

13C211-EC6402-COMMUNICATION THEORY

13C211.1	Explain the principles of different analog modulation techniques
13C211.2	Describe the spectral characteristics of angle modulation techniques
13C211.3	Apply the concepts of Random Process in Communication Systems
13C211.4	Compare noise performance of AM and FM receivers
13C211.5	Explain about discrete memoryless channel and compute the channel efficiency.

13C212-EC6403-ELECTROMAGNETIC FIELDS

13C212.1	Explain the concepts of Coordinate system and laws associated to static electric field
13C212.2	Describe the properties of conductors and dielectric
13C212.3	Describe the laws associated to static Magnetic field
13C212.4	Describe the laws associated to static Magnetic field
13C212.5	Write the Maxwell's equation in different form to understand the electromagnetic wave propagation

13C213-EC6404-LINEAR INTEGRATED CIRCUITS

13C213.1	Explain the linear and non-linear operational amplifiers.
13C213.2	Explain the applications of operational amplifiers
13C213.3	Describe the analog multiplier & PLL circuits and its applications.
13C213.4	Summarize the operations of ADC and DAC using OP-AMP.
13C213.5	Summarize the concept of generation of waveforms using op-amps and operations of special function ICs.

13C214-EC6405-CONTROL SYSTEM ENGINEERING

13C214.1	Explain the various control system components and Determine transfer function for physical systems.
13C214.2	Determine the transient and steady state behaviour of systems subjected to standard test signals
13C214.3	Solve the various frequency response plots and develop Compensators using bode plot.
13C214.4	Determine the stability of the system using various stability criterions.
13C214.5	Determine the transfer function using state variable model.

13C215-EC6411-CIRCUIT AND SIMULATION INTEGRATED LABORATORY

13C215.1	Demonstrate the performance of various types of feedback amplifiers by obtaining its frequency response.
13C215.2	Verify the response of Tuned Amplifiers and oscillator circuits.
13C215.3	Verify the response of wave shaping circuits, Multivibrators and free running blocking oscillator.
13C215.4	Simulate Feedback, Tuned Amplifiers and oscillator circuits using PSPICE.
13C215.5	Simulate wave shape circuits and Voltage and current base circuits using PSPICE.
13C215.6	Exhibit ethical principles in engineering practices
13C215.7	Perform task as an individual and/ or team member to manage the task in time
13C215.8	Express the engineering activities with effective presentation and report.
13C215.9	Interpret the findings with appropriate technological/ research citation

13C216-EC6412-LINEAR INTEGRATED CIRCUIT LABORATORY

13C216.1	Demonstrate the working of oscillators , amplifiers using operational amplifiers.
13C216.2	Demonstrate the performance characteristics of filters , schmitt Trigger and multivibrators using op-amp .
13C216.3	Demonstrate the working of PLL and its application as frequency multiplier.
13C216.4	Demonstrate the working of DC power supply and multivibrators using timer.
13C216.5	Simulate amplifiers, filters, oscillators multivibrators, A/D converters, analog multipliers and CMOS Inverter, NAND and NOR using PSPICE
13C216.6	Exhibit ethical principles in engineering practices
13C216.7	Perform task as an individual and/ or team member to manage the task in time
13C216.8	Express the engineering activities with effective presentation and report.
13C216.9	Interpret the findings with appropriate technological/ research citation

13C217-EE6461-ELECTRICAL ENGINEERING AND CONTROL SYSTEM LABORATORY

13C217.1	Understand the load characteristics of DC motors / generators
13C217.2	Understand the load characteristics and Calculate the Performance of both of Transformer and Induction Motor.
13C217.3	Demonstrate the bridge network circuit to measure the values of passive component.
13C217.4	Analyze the stability of linear system through simulation software.
13C217.5	Illustrate the transfer function of DC generators.
13C217.6	Exhibit ethical principles in engineering practices
13C217.7	Perform task as an individual and/ or team member to manage the task in time
13C217.8	Express the engineering activities with effective presentation and report.
13C217.9	Interpret the findings with appropriate technological/ research citation

13C301-EC6501-DIGITAL COMMUNICATION

13C301.1	Apply the basic concepts of channel coding of discrete memoryless channel
13C301.2	Apply the various waveform coding schemes in digital communication systems.
13C301.3	Construct baseband transmission and Reception schemes in different ways.
13C301.4	Analyze various digital modulation schemes.
13C301.5	Apply the various channel coding in digital communication systems by error control coding scheme.

13C302-EC6502-PRINCIPLES OF DIGITAL SIGNAL PROCESSING

13C302.1	Apply DFT for the analysis of digital signals and systems
13C302.2	Develop various filters for Infinite impulse response and realization of its response
13C302.3	Develop various filters for finite impulse response and realization of its response
13C302.4	Explain the Effects of Finite Precision Representation in Digital Filters
13C302.5	Explain the various DSP applications

13C303-EC6503-TRANSMISSION LINES AND WAVE GUIDES

13C303.1	Explain the characteristics of transmission lines and its losses.
13C303.2	Describe about the standing wave ratio and input impedance in high frequency transmission lines.
13C303.3	Make use of smith chart to determine impedance matching by stubs.
13C303.4	Classify the working of various filters in transmission lines.
13C303.5	Apply the Maxwell's equation to determine the characteristics of TE and TM waves in different waveguides.

13C304-GE6351-ENVIRONMENTAL SCIENCE AND ENGINEERING

13C304.1	Illustrate the features of Ecosystem& biodiversity
13C304.2	Choose pollution control methods and waste management.
13C304.3	Apply the environmental concepts for conservation and protection of natural resources.
13C304.4	Demonstrate the impact of social issues on environment
13C304.5	Demonstrate the impact of human on environment.

13C305-EC6504-MICROPROCESSOR AND MICROCONTROLLER

13C305.1	Explain the Architecture of 8086 microprocessors and Demonstrate the programs on 8086 microprocessor
13C305.2	Explain the Bus structure and configuration of 8086 microprocessor
13C305.3	Apply the design aspects of I/O and memory interfacing circuits
13C305.4	Explain the Architecture of 8051 Microcontroller and Demonstrate the programs on 8051 Microcontroller
13C305.5	Develop a simple 8051 microcontroller based systems with its resources and compare different processors and controllers.

13C306-EC6511-DIGITAL SIGNAL PROCESSING LABORATORY

13C306.1	Demonstrate the generation of Discrete Time Signals and signal processing operations
13C306.2	Develop the Programs for Frequency Analysis using DFT
13C306.3	Analyze the performance of IIR, FIR and Multirate filters to demonstrate the filtering operation
13C306.4	Generate the Discrete Time Signals and perform signal processing operations using DSP processors
13C306.5	Make use of DSP processors to demonstrate the FIR and IIR filter operations
13C306.6	Exhibit ethical principles in engineering practices
13C306.7	Perform task as an individual and/ or team member to manage the task in time
13C306.8	Express the engineering activities with effective presentation and report.
13C306.9	Interpret the findings with appropriate technological/ research citation

13C307-EC6512-COMMUNICATION SYSTEM LABORATORY

13C307.1	Ability to demonstrate the various functional modules of a communication system
13C307.2	Ability to apply the different analog modulation schemes in communication system and to identify its performance measures.
13C307.3	Ability to apply the concept of various digital modulation schemes in a communication system and to identify the performance.
13C307.4	Apply the various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system .
13C307.5	Apply the various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system .
13C307.6	Exhibit ethical principles in engineering practices
13C307.7	Perform task as an individual and/ or team member to manage the task in time
13C307.8	Express the engineering activities with effective presentation and report.
13C307.9	Interpret the findings with appropriate technological/ research citation

13C308-EC6513-MICROPROCESSOR AND MICROCONTROLLER LABORATORY

13C308.1	To write programs for arithmetical & logical operations, data transfer and code conversion in 8086.
13C308.2	To Develop the programs for sorting and string manipulation in 8086
13C308.3	To Contrast how different, I/O devices can be interfaced to processor and explore several techniques of interfacing Analysis
13C308.4	To write programs for arithmetical, logical operations and code conversion in 8051.
13C308.5	To Develop the programs using Timer and DAC to generate waveforms
13C308.6	Exhibit ethical principles in engineering practices
13C308.7	Perform task as an individual and/ or team member to manage the task in time
13C308.8	Express the engineering activities with effective presentation and report.
13C308.9	Interpret the findings with appropriate technological/ research citation

13C309-MG6851-PRINCIPLES OF MANAGEMENT

13C309.1	Explain the managerial roles in local and global organization, environmental factors & strategies for International business.
13C309.2	Describe the planning process & benefits of MBO and prescribe the decision making model under different conditions.
13C309.3	Illustrate the different organization structure, Line & staff authority, staff selection & career development and performance appraisal process.
13C309.4	Demonstrate the creativity, innovation and leadership styles through the principles of effective communication and organization culture.
13C309.5	Explain the process of control authority, budget preparation, productivity measurement and planning operations in management.

13C310-CS6303-COMPUTER ARCHITECTURE

13C310.1	Illustrate the structures of computers, operations and instructions.
13C310.2	Explain fixed-point and floating point arithmetic in ALU unit.
13C310.3	Illustrate the pipelined execution and design control unit.
13C310.4	Demonstrate the parallel processing architectures.
13C310.5	Explain various memory systems and I/O communication.

13C311-CS6551-COMPUTER NETWORKS

13C311.1	Explain the OSI model and its layer responsibilities in detail.
13C311.2	Interpret the medium access protocols used for internetworking.
13C311.3	Make use of the routing algorithms to find the shortest path in a network for data transfer.
13C311.4	Explain the protocols and congestion control mechanisms involved in transport layer
13C311.5	Classify the different application layer protocols and learn its functions.

13C312-EC6601-VLSI DESIGN

13C312.1	Identify the characteristics and properties of CMOS circuits
13C312.2	Construct the combinational logic circuits for digital operations and its power dissipation.
13C312.3	Construct the sequential logic circuits for digital operations and its timing issues.
13C312.4	Develop different circuits of arithmetic building blocks and its memory architecture.
13C312.5	Summarize the building blocks of FPGA and different testing techniques.

13C313-EC6602-ANTENNA AND WAVE PROPAGATION

13C313.1	Explain the concept of antenna fundamentals and its radiation effects.
13C313.2	Interpret the concepts of aperture antennas.
13C313.3	Explain various types of array antennas.
13C313.4	Analyze special antennas and the techniques to measure the Gain, Radiation pattern & VSWR of antenna.
13C313.5	Identify and explain the mechanism of atmospheric effects on radio wave propagation.

13C314 (PE-I)-EC6001-MEDICAL ELECTRONICS

13C314.1	Explain the terminologies of electro-physiology and its recording
13C314.2	Describe the measurement techniques of biochemical and non-electrical parameters.
13C314.3	Demonstrate the various types of assist devices
13C314.4	Construct the diathermy and bio telemetry system
13C314.5	Explain the recent trends of biomedical instrumentation units which will help to restore normal functioning.

13C315-EC6611-COMPUTER NETWORKS LABORATORY

13C315.1	Implement Error detection /correction techniques.
13C315.2	Implement flow control mechanism using protocols for data transfer in communication networks.
13C315.3	Implement IP Commands and IP address configuration.
13C315.4	Make use of the routing algorithms associated with network layer functions of the OSI model.
13C315.5	simulate cryptographic algorithms and congestion control algorithms.
13C315.6	Exhibit ethical principles in engineering practices
13C315.7	Perform task as an individual and/ or team member to manage the task in time
13C315.8	Express the engineering activities with effective presentation and report.
13C315.9	Interpret the findings with appropriate technological/ research citation

13C316-EC6612-VLSI DESIGN LABORATORY

13C316.1	Develop the HDL Code for basic integrated digital circuits
13C316.2	Develop the HDL code for advanced digital integrated digital circuits
13C316.3	Experiment with the FPGA board by transferring the logic modules into it.
13C316.4	Develop, Synthesis, Place and Route the digital IPs
13C316.5	Design, simulate and extract the layouts of Analog IC blocks using EDA tools
13C316.6	Exhibit ethical principles in engineering practices
13C316.7	Perform task as an individual and/ or team member to manage the task in time
13C316.8	Express the engineering activities with effective presentation and report.
13C316.9	Interpret the findings with appropriate technological/ research citation

13C317-GE6674-COMMUNICATION AND SOFT SKILLS - LABORATORY BASED

13C317.1	Make use of GD Strategies and participating in Group Discussion
13C317.2	Develop various types and formats of reports, emails, resumes, letters, to meet particular needs or purposes
13C317.3	Develop their knowledge to take part in international examination such as IELTS and TOEFL for enhancing verbal ability.
13C317.4	Relate the stress management & career management strategies in one's career development
13C317.5	Develop their creative and critical thinking adapting learning styles and strategies
13C317.6	Exhibit ethical principles in engineering practices
13C317.7	Perform task as an individual and/ or team member to manage the task in time
13C317.8	Express the engineering activities with effective presentation and report.
13C317.9	Interpret the findings with appropriate technological/ research citation

13C401-EC6701-RF AND MICROWAVE ENGINEERING

13C401.1	Explain the low frequency and high frequency parameters
13C401.2	Analyze characteristics of amplifier and matching networks
13C401.3	Explain the active & passive microwave devices used in Microwave communication systems.
13C401.4	Utilize the microwave amplifiers for microwave generation.
13C401.5	Analyse microwave signals and parameters.

13C402-EC6702-OPTICAL COMMUNICATION AND NETWORKS

13C402.1	Explain the various fiber modes & configurations in optical fiber.
13C402.2	Identify the various signal degradation factors associated with optical fiber.
13C402.3	Explain the various optical sources and optical detectors and their use in the optical communication system.
13C402.4	Explain the Receiver configuration and various optical fiber measurements associated with optical system.
13C402.5	Analyze the digital transmission and its associated parameters on system performance.

13C403-EC6703-EMBEDDED AND REAL TIME SYSTEMS

13C403.1	Explain the concepts of Embedded Computing and Demonstrate the programs on ARM processor.
13C403.2	Outline the program level concepts in embedded processor computing.
13C403.3	Explain the basic concepts of real time Operating System.
13C403.4	Explain the various design methodologies for embedded system.
13C403.5	Describe the real-time applications using embedded-system concepts.

13C404 (PE-II)-IT6005-DIGITAL IMAGE PROCESSING

13C404.1	Explain Digital Image Fundamentals.
13C404.2	Describe Image Enhancement Techniques
13C404.3	Explain Image Restoration and Segmentation Techniques
13C404.4	Apply various models for Image Compression Techniques
13C404.5	Represent the features of Images

13C405 (PE-III)--EC6011-ELECTROMAGNETIC INTERFERENCE AND COMPATIBILITY

13C405.1	Understand the different types of EMI sources and the basic issues of electromagnetic compatibility problems.
13C405.2	Describe about different coupling mechanisms of EMI.
13C405.3	Identify the solution to EMI problems in PCB level design, subsystem and system level design
13C405.4	Explain the various EMI/EMC standards and regulation.
13C405.5	Summarize about the emission immunity level from different systems to couple with prescribed EMC standards.

13C406 (PE-IV)-EC6016-OPTO ELECTRONIC DEVICES

13C406.1	Explain the basics of Solid state semiconductor physics.
13C406.2	Explain concepts of LEDs and LASER.
13C406.3	Classify different optical detection devices.
13C406.4	Distinguish among different light modulation techniques.
13C406.5	Explain the operation of Optoelectronic Integrated Circuits and its Applications

13C407-EC6711-EMBEDDED LABORATORY

13C407.1	Practice to write the programs for ARM based applications.
13C407.2	Demonstrate the memory operations, A/D & D/A convertors using ARM system
13C407.3	Analyze the interrupt functions in ARM based systems.
13C407.4	Demonstrate the keyboard, display, motor and sensor interfacing units.
13C407.5	Design an ARM based system as a mini project.
13C407.6	Exhibit ethical principles in engineering practices
13C407.7	Perform task as an individual and/ or team member to manage the task in time
13C407.8	Express the engineering activities with effective presentation and report.
13C407.9	Interpret the findings with appropriate technological/ research citation

13C408-EC6712-OPTICAL AND MICROWAVE LABORATORY

13C408.1	Show the DC characteristic of LED and photo diode.
13C408.2	Demonstrate the performance of analog and digital optical link.
13C408.3	Identify various types of losses associated with fibers
13C408.4	Demonstrate the characteristics of various microwave active and passive components.
13C408.5	Demonstrate the microwave parameters such as frequency, wavelength, VSWR and radiation pattern.
13C408.6	Exhibit ethical principles in engineering practices
13C408.7	Perform task as an individual and/ or team member to manage the task in time
13C408.8	Express the engineering activities with effective presentation and report.
13C408.9	Interpret the findings with appropriate technological/ research citation

13C409-EC6801-WIRELESS COMMUNICATION

13C409.1	Explain the wireless channel characteristics and outline the mobile radio propagation, fading models and parameters.
13C409.2	Identify the cellular system based on resource availability and traffic demands with technical challenges.
13C409.3	Apply the digital signalling schemes with a model of QPSK,DQPSK signals.
13C409.4	Identify suitable signalling and multipath mitigation techniques for the wireless channel and system under consideration.
13C409.5	Explain the various multiple antenna techniques and MIMO systems.

13C410-EC6802-WIRELESS NETWORKS

13C410.1	Explain the various protocols and standards of wireless LAN.
13C410.2	Describe the Internet protocols and routing procedure in mobile network layer.
13C410.3	Explain the concept of TCP in mobile transport layer.
13C410.4	Explain the different wireless WAN architectures.
13C410.5	Explain the concept of latest 4G network strategies.

13C411 (PE-V)-CS6003-ADHOC AND SENSOR NETWORKS

13C411.1	Explain the concepts, network architectures and applications of ad hoc and wireless sensor networks
13C411.2	Classify the design issues and different categories of MAC protocols
13C411.3	Explain the various Ad hoc routing protocols and transport layer mechanisms
13C411.4	Explain the sensor characteristics and WSN layer protocols
13C411.5	Illustrate the issues of routing in WSN and QoS related performance measurements

13C412 (PE-V)-EC6018-MULTIMEDIA COMPRESSION AND COMMUNICATION

13C412.1	Explain the various multimedia components.
13C412.2	Apply the various audio and video compression techniques.
13C412.3	Apply the various text and image compression techniques.
13C412.4	Analyze the concepts of VoIP technology.
13C412.5	Explain the compression concepts in multimedia communication.

13C413 (PE-VI)-CS6701-CRYPTOGRAPHY AND NETWORK SECURITY

13C413.1	Compare various encryption techniques.
13C413.2	Contrast public key algorithms with private key algorithms.
13C413.3	Apply various message authentication functions and secure algorithms.
13C413.4	Identify different types of security systems and applications.
13C413.5	Analyze different levels of security and services in e-mail & web security

13C414 (PE-VI)-EC6019-DATA CONVERTERS

13C414.1	Explain the concept and architecture of sample and hold circuits.
13C414.2	Use the single stage and cascaded stage amplifiers as comparator.
13C414.3	Illustrate the types of Analog to Digital Conversion (ADC) circuits.
13C414.4	Illustrate the types of Digital to Analog Conversion (DAC) circuits.
13C414.5	Explain the precision and calibration techniques.

13C415-EC6811-PROJECT WORK

13C415.1	Use literature to identify the objective, scope and the concept of the work
13C415.2	Apply suitable methods and materials to carry out experiments by conserving eco-system
13C415.3	Develop a prototype-experimental set-up necessary to complete the project
13C415.4	Discuss the results obtained to derive conclusions
13C415.5	Defend the work by preparing a report as per the University format.
13C415.6	Assess health, safety and legal relevant to professional engineering practices.
13C415.7	Comply the environmental needs and sustainable development.
13C415.8	Justify ethical principles in engineering practices
13C415.9	Perform multi-disciplinary task as an individual and - or team member to manage the project-task.
13C415.10	Comprehend the Engineering activities with effective presentation and report.
13C415.11	Interpret the findings with appropriate technological - research citation

HOD **PRINCIPAL**