ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.E Electronics and Communication Engineering
Anna University Regulation 2017
List of Course Names

S.No.	Sem	Course code	Course	Course Title
1.	I	17C101	HS8151	Communicative English
2.	I	17C102	MA8151	Engineering Mathematics - I
3.	I	17C103	PH8151	Engineering Physics
4.	I	17C104	CY8151	Engineering Chemistry
5.	I	17C105	GE8151	Problem Solving and Python Programming
6.	I	17C106	GE8152	Engineering Graphics
7.	I	17C107	GE8161	Problem Solving and Python Programming Laboratory
8.	I	17C108	BS8161	Physics and Chemistry Laboratory
9.	II	17C109	HS8251	Technical English
10.	II	17C110	MA8251	Engineering Mathematics - II
11.	II	17C111	PH8253	Physics for Electronics Engineering
12.	II	17C112	BE8254	Basic Electrical and Instrumentation Engineering
13.	II	17C113	EC8251	Circuit Analysis
14.	II	17C114	EC8252	Electronic Devices
15.	II	17C115	EC8261	Circuits and Devices Laboratory
16.	II	17C116	GE8261	Engineering Practices Laboratory
17.	III	17C201	MA8352	Linear Algebra and Partial Differential Equations
18.	III	17C202	EC8393	Fundamentals of Data Structures In C
19.	III	17C203	EC8351	Electronic Circuits- I
20.	III	17C204	EC8352	Signals and Systems
21.	III	17C205	EC8392	Digital Electronics
22.	III	17C206	EC8391	Control Systems Engineering

23.	III	17C207	EC8381	Fundamentals of Data Structures in C Laboratory
24.	III	17C208	EC8361	Analog and Digital Circuits Laboratory
25.	III	17C209	HS8381	Interpersonal Skills/Listening &Speaking
26.	IV	17C210	MA8451	Probability and Random Processes
27.	IV	17C211	EC8452	Electronic Circuits II
28.	IV	17C212	EC8491	Communication Theory
29.	IV	17C213	EC8451	Electromagnetic Fields
30.	IV	17C214	EC8453	Linear Integrated Circuits
31.	IV	17C215	GE8291	Environmental Science and Engineering
32.	IV	17C216	EC8461	Circuits Design and Simulation Laboratory
33.	IV	17C217	EC8462	Linear Integrated Circuits Laboratory
34.	V	17C301	EC8501	Digital Communication
35.	V	17C302	EC8553	Discrete-Time Signal Processing
36.	V	17C303	EC8552	Computer Architecture and Organization
37.	V	17C304	EC8551	Communication Networks
38.	V	17C305(PE-I)	CS8392	Object Oriented Programming
39.	V	17C306(PE-I)	EC8073	Medical Electronics
40.	V	17C307(PE-I)	EC8074	Robotics and Automation
41.	V	17C308(OE-I)	OMD551	Basics of Biomedical Instrumentation
42.	V	17C309(OE-I)	OTL552	Digital Audio Engineering
43.	V	17C310(OE-I)	OME551	Energy Conservation and Management
44.	V	17C311	EC8562	Digital Signal Processing Laboratory
45.	V	17C312	EC8561	Communication Systems Laboratory
46.	V	17C313	EC8563	Communication Networks Laboratory
47.	VI	17C314	EC8691	Microprocessors and Microcontrollers
48.	VI	17C315	EC8095	VLSI Design
49.	VI	17C316	EC8652	Wireless Communication

50.	VI	17C317	MG8591	Principles of Management
51.	VI	17C318	EC8651	Transmission Lines and RF Systems
52.	VI	17C319(PE-II)	EC8004	Wireless Networks
53.	VI	17C320	EC8681	Microprocessors and Microcontrollers Laboratory
54.	VI	17C321	EC8661	VLSI Design Laboratory
55.	VI	17C322	EC8611	Technical Seminar
56.	VI	17C323	HS8581	Professional Communication
57.	VII	17C401	EC8701	Antennas and Microwave Engineering
58.	VII	17C402	EC8751	Optical Communication
59.	VII	17C403	EC8791	Embedded and Real Time Systems
60.	VII	17C404	EC8702	Ad hoc and Wireless Sensor Networks
61.	VII	17C405(PE-III)	EC8071	Cognitive Radio
62.	VII	17C406(PE-III)	GE8071	Disaster Management
63.	VII	17C407(OE-II)	OBM752	Hospital Management
64.	VII	17C408(OE-II)	OIC751	Transducer Engineering
65.	VII	17C409	EC8711	Embedded Laboratory
66.	VII	17C410	EC8761	Advanced Communication Laboratory
67.	VIII	17C411(PE-IV)	EC8093	Digital Image Processing
68.	VIII	17C412(PE-V)	EC8094	Satellite communication
69.	VIII	17C413	EC8811	Project Work

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Course Outcomes (CO)

17C101- HS8151 COMMUNICATION ENGLISH

17C101.1	Construct dialogues for informal conversations and make a lead in group; introduce themselves and their friends and express opinions in English.
17C101.2	Develop general comprehending skills and present lucid skills in free writing.
17C101.3	Make use of the basic grammar techniques and utilize it in enhancing language development
17C101.4	Outline informal, personal letters and emails in English.
17C101.5	Extend the proficiency in writing short essays and relate main and subordinate ideas to improve the writing skill

17C102 -MA8151-ENGINEERING MATHEMATICES-I

17C102.1	Identify maxima or minima of functions of one variable using differentiation..
17C102.2	Identify maxima or minima in two variables using partial differentiation.
17C102.3	Solve proper and improper integrals.
17C102.4	Apply multiple integral techniques in evaluating Area and Volume of Solids
17C102.5	Solve differential equations in Engineering problems.

17C103-PH8151-ENGINEERING PHYSICS

17C103.1	Illustrate basic concepts of stress and strain in solids
17C103.2	Classify the type of optical fiber and Laser
17C103.3	Infer about the transfer of heat energy and its applications
17C103.4	Illustrate the quantum theory and its applications
17C103.5	Outline the various crystal structure and its growth techniques

17C104-CY8151-ENGINEERING CHEMISTRY

17C104.1	Summarize the water related problems in boilers and their treatment techniques.
17C104.2	Explain the concept and need of catalysis.
17C104.3	Apply the chemical properties to categorize the engineering materials and their uses.
17C104.4	Illustrate the quality of fuel by its properties.
17C104.5	Illustrate the methods of harnessing energy from non-conventional energy sources.

17C105-GE8151-PROBLEM SOLVING AND PYTHON PROGRAMMING

17C105.1	Explain algorithmic solutions to simple computational problems.
17C105.2	Explain simple Python statements and expressions.
17C105.3	Apply control flow and functions concept in Python for solving problems
17C105.4	Explain – lists, tuples & dictionaries for representing compound data
17C105.5	Apply files, exception, modules and packages in Python for solving problems

17C106-GE8152-ENGINEERING GRAPHICS

17C106.1	Discuss the orthographic views of Engineering components.
17C106.2	Relate to basic principles of orthographic projection for drawing projection of points, lines and planes.
17C106.3	Apply basic principles of orthographic projection for drawing projection of solids like prisms, pyramids, cone and cylinder.
17C106.4	Show the sectioned view of solids and the development of solid surfaces
17C106.5	Show the isometric projection and perspective views for simple solids.

17C107-GE8161 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

17C107.1	Apply basic concepts and simple Python programs.
17C107.2	Explain Python programs with conditionals and loops.
17C107.3	Apply function definition and recursion in Python program.
17C107.4	Apply Python lists, tuples, and dictionaries for representing compound data.
17C107.5	Apply Read and write data from/to files in python program.
17C107.6	Exhibit ethical principles in engineering practices
17C107.7	Perform task as an individual and/ or team member to manage the task in time
17C107.8	Express the engineering activities with effective presentation and report.
17C107.9	Interpret the findings with appropriate technological/ research citation

17C108-BS8161-PHYICS AND CHEMISTRY LABORATORY

17C108.1	Explain the physical parameters such as thickness of a wire, band gap of semiconductor both individually and by team by using experiments
17C108.2	Compare the Young's modulus and Rigidity modulus of different materials
17C108.3	List the velocity of ultrasonic waves in different liquids like water and kerosene
17C108.4	Estimate strength of acids quantitatively based on the conductance and PH level of the solution both individually and in teams
17C108.5	Estimate water quality parameters such as dissolved oxygen content, chloride content and iron content of the water samples both individually and in teams
17C108.6	Exhibit ethical principles in engineering practices
17C108.7	Perform task as an individual and/ or team member to manage the task in time
17C108.8	Express the engineering activities with effective presentation and report.
17C108.9	Interpret the findings with appropriate technological/ research citation

17C109-HS8251-TECHNICAL ENGLISH

17C109.1	Interpret the passage listened from talk and comprehension.
17C109.2	Rephrase the paragraph of talks and comprehension passages after reading and Interpret charts and graphs.
17C109.3	Develop their speaking skills to make technical presentation
17C109.4	Summarize, resume, analytical and issue-based essays.
17C109.5	Summarize reports and minutes of meeting suitably

17C110-MA8251-ENGINEERING MATHEMATICES-II

17C110.1	Apply the concept of orthogonal transformation to diagonalise the given matrix
17C110.2	Solve line integral, surface integral and volume integral in Engineering applications.
17C110.3	Relate analytic functions by Milne's Thomson method.
17C110.4	Solve real definite integrals as contour integrals around unit circle and semi-circle
17C110.5	Solve the second order ODE by Laplace transformation.

17C111-PH8253-PHYSICS FOR ELECTRONICS ENGINEERING

17C111.1	Infer the electrical properties of material.
17C111.2	Classify the type of semiconductor and its uses.
17C111.3	Outline the magnetic and dielectric properties of different materials.
17C111.4	Explain the optical properties of materials
17C111.5	Interpret the Nano devices and its applications

17C112-BE8254-BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING

17C112.1	Apply the concept of three phase circuits in power system.
17C112.2	Analyze the working and performance characteristics of static AC machine.
17C112.3	Analyze the construction and working of DC machines.
17C112.4	Illustrate the working of various AC machines.
17C112.5	Analyze the working of various measuring instrument

17C113-EC8251-CIRCUIT ANALYSIS

17C113.1	Apply Kirchhoff's law on DC and AC network.
17C113.2	Apply network theorems on DC& AC circuit.
17C113.3	Analyze the performance of resonance and coupled circuits.
17C113.4	Distinguish the transient response of the DC and AC circuits for various excitation
17C113.5	Analyze the parameter of two port network

17C114-EC8252-ELECTRONIC DEVICES

17C114.1	Explain the basic concept and operation of PN Junction Diode.
17C114.2	Explain the operation of Bipolar Junction Transistor in various configuration.
17C114.3	Explain the basic concept and operation of FET and MOSFET.
17C114.4	Explain the operation of various Special Semiconductor Devices.
17C114.5	Explain the operation of various power devices and display devices.

17C115-EC8261-CIRCUIT AND DEVICES LABORATORY

17C115.1	Observe the characteristics of diodes and regulator using zener diode.
17C115.2	Demonstrate the input and output characteristics of BJT , FET and SCR
17C115.3	Construct the clipper, clamper & FWR circuits.
17C115.4	Demonstrate the circuits using KVL, KCL, Thevinin, Norton, Superposition, maximum power transfer and reciprocity theorems.
17C115.5	Illustrate the resonance frequency of series & parallel RLC Circuits and the transient response of RL and RC circuits.
17C115.6	Exhibit ethical principles in engineering practices
17C115.7	Perform task as an individual and/ or team member to manage the task in time
17C115.8	Express the engineering activities with effective presentation and report.
17C115.9	Interpret the findings with appropriate technological/ research citation

17C116-GE8261-ENGINEERING PRACTICES LABORATORY

17C116.1	Explain the various manufacturing process in smithy, foundry, fitting, assembling and disassembling and will be able to provide effective presentation.
17C116.2	Summarize the operations of various machine tools lathe , drilling
17C116.3	Develop models by using skills achieved from workshop sections like welding, carpentry, sheet metal and plumbing
17C116.4	Apply the skills of basic electrical engineering for domestic wiring practices
17C116.5	Apply the measuring instruments like energy meter and perform measurements in electrical circuits.
17C116.6	Explain the working of electronic components.
17C116.7	Apply the electronic principle for develop engineering circuits.
17C116.8	Exhibit ethical principles in engineering practices
17C116.9	Perform task as an individual and/ or team member to manage the task in time
17C116.10	Express the engineering activities with effective presentation and report.
17C116.11	Interpret the findings with appropriate technological/ research citation

17C201-MA8352-LINEAR ALGEBRA AND PARTIAL DIFFERENTIAL EQUATION

17C201.1	Express Vector Spaces in different dimensions.
17C201.2	Explain matrix representation and Eigen values, Eigen vectors of linear transformation.
17C201.3	Apply inner product spaces in Orthogonalization
17C201.4	Solve Homogeneous and Non-homogeneous differential equations using Partial Differentiation
17C201.5	Solve one dimensional wave and heat equations using Fourier series and its steady state.

17C202-EC8393-FUNDAMENTALS OF DATA STRUCTURE IN C

17C202.1	Develop C Program using the concepts of looping, branching, arrays and string
17C202.2	Develop c program using the concepts of Functions, Pointers, Structures And Unions
17C202.3	Analyze the different Linear Data Structures algorithms using c programming
17C202.4	Analyze the different Non-Linear Data Structures algorithm using c programming
17C202.5	Analyze the concept of Searching And Sorting Algorithms

17C203-EC8351-ELECTRONIC CIRCUITS-I

17C203.1	Understand the working principles, Characteristics and Applications of BJT, FET and MOSFET.
17C203.2	Apply the hybrid pi parameters for the small analysis of various BJT Amplifiers
17C203.3	Apply the hybrid pi parameters for the small analysis of FET and MOSFET Amplifiers
17C203.4	Develop the high frequency model of BJT, FET and MOSFET amplifier circuits.
17C203.5	Explain the different stages of power supply modules.

17C204-EC8352-SIGNALS AND SYSTEMS

17C204.1	Classify the different types of continuous and discrete time signals and systems.
17C204.2	Apply Fourier series, Laplace transform & Fourier transform in continuous time signal .
17C204.3	Analyse continuous time LTI systems using Fourier and Laplace Transforms.
17C204.4	Apply Z transform and DTFT in discrete time signal .
17C204.5	Analyse discrete time LTI systems using Z transform and DTFT.

17C205-EC8392-DIGITAL ELECTRONICS

17C205.1	Explain the Use of digital electronics in the present contemporary world
17C205.2	Identify various types of combinational digital circuits using logic gates
17C205.3	Analyze synchronous sequential circuits
17C205.4	Analyze asynchronous sequential circuits
17C205.5	Compare the semiconductor memories and related technologies.

17C206-EC8391-CONTROL SYSTEMS ENGINEERING

17C206.1	Explain the various control system components and Determine transfer function for physical systems.
17C206.2	Determine the transient and steady state behaviour of systems subjected to standard test signals
17C206.3	Solve the various frequency response plots and develop Compensators using bode plot.
17C206.4	Determine the stability of the system using various stability criterions.
17C206.5	Determine the transfer function using state variable model.

17C207-EC8381-FUNDAMENTAL OF DATA STRUCTURES IN C LABORATORY

17C207.1	Experiment with the basic and advanced programs in C
17C207.2	Utilize the functions and recursive functions in C
17C207.3	Build the linear data structures using C
17C207.4	Build the nonlinear data structures using C
17C207.5	Make use of sorting & searching algorithm to increase the efficiency using C programming.
17C207.6	Exhibit ethical principles in engineering practices
17C207.7	Perform task as an individual and/ or team member to manage the task in time
17C207.8	Express the engineering activities with effective presentation and report.
17C207.9	Interpret the findings with appropriate technological/ research citation

17C208-EC8361-ANALOG & DIGITAL CIRCUITS LABORATORY

17C208.1	Demonstrate the performance of CE/CB/CC/CS amplifiers, by obtaining its frequency response.
17C208.2	Verify the characteristics of different amplifier circuits and the efficiency of regulated power supply.
17C208.3	Simulate BJT, FET and MOSFET, Cascode and Cascade amplifiers using PSPICE .
17C208.4	Build combinational circuits for Arithmetic, Code conversions, data selection and distribution operations.
17C208.5	Construct Sequential circuits for Counter operations.
17C208.6	Exhibit ethical principles in engineering practices
17C208.7	Perform task as an individual and/ or team member to manage the task in time
17C208.8	Express the engineering activities with effective presentation and report.
17C208.9	Interpret the findings with appropriate technological/ research citation

17C209-HS8381-INTERPERSONAL SKILL/LISTENING AND SPEAKING

17C209.1	Interpret ideas with clear utterances
17C209.2	Build general and academic listening skills and respond in different situation
17C209.3	Explain opinion and converse effectively both formal and informal
17C209.4	Apply skills in GD for life long progress
17C209.5	Make use of communicative techniques and speak fluently in English throughout their life
17C209.6	Exhibit ethical principles in engineering practices
17C209.7	Perform task as an individual and/ or team member to manage the task in time
17C209.8	Express the engineering activities with effective presentation and report.
17C209.9	Interpret the findings with appropriate technological/ research citation

17C210-MA8451-PROBABILITY AND RANDOM PROCESS

17C210.1	Explain the basic knowledge of Probability and Distributions
17C210.2	Explain the fundamental knowledge of One and Two dimensional random variables
17C210.3	Categorize Discrete and Continuous processes
17C210.4	Apply the knowledge of correlation and spectral density in Engineering problems
17C210.5	Analyse linear time invariant system

17C211-EC8452-ELECTRONIC CIRCUITS-II

17C211.1	Explain the concept of feedback amplifiers and stability problems
17C211.2	Classify the oscillator circuits based on frequency range.
17C211.3	Use the Neutralization techniques in tuned amplifiers circuits.
17C211.4	Categorize the wave shaping and multivibrator circuits .
17C211.5	Illustrate the Power amplifiers and DC - DC converter circuits.

17C212-EC8491-COMMUNICATION THEORY

17C212.1	Explain the principles of different analog modulation techniques
17C212.2	Describe the spectral characteristics of angle modulation techniques
17C212.3	Apply the concepts of Random Process in Communication Systems
17C212.4	Compare noise performance of AM and FM receivers
17C212.5	Summarize the principles of sampling and quantization.

17C213-EC8451-ELECTROMAGNETIC FIELDS

17C213.1	Explain the concepts of Coordinate system and electromagnetic Laws
17C213.2	Describe the laws associated to static electric field and the properties of conductors and dielectric
17C213.3	Describe the laws associated to static Magnetic field and behaviour of magnetic materials
17C213.4	Write the Maxwell's equation in different form to understand the electromagnetic wave propagation
17C213.5	Explain electromagnetic wave propagation in lossy and in lossless media

17C214-EC8453-LINEAR INTEGRATED CIRCUITS

17C214.1	Explain the linear and non-linear operational amplifiers.
17C214.2	Explain the applications of operational amplifiers
17C214.3	Describe the analog multiplier & PLL circuits and its applications.
17C214.4	Summarize the operations of ADC and DAC using OP-AMP.
17C214.5	Summarize the concept of generation of waveforms using op-amps and operations of special function ICs.

17C215-GE8291-ENVIRONMENTAL SCIENCE AND ENGINEERING

17C215.1	Illustrate the features of ecosystem & biodiversity
17C215.2	Choose pollution control methods and waste management.
17C215.3	Apply the environmental concepts for conservation and protection of natural resources.
17C215.4	Demonstrate the impact of social issues on environment.
17C215.5	Demonstrate the impact of human on environment.

17C216-EC8461-CIRCUITS DESIGN AND SIMULATION LABORATORY

17C216.1	Demonstrate the performance of various types of feedback amplifiers by obtaining its frequency response.
17C216.2	Verify the response of Tuned Amplifiers and oscillator circuits.
17C216.3	Verify the response of wave shaping circuits and Multivibrators.
17C216.4	Simulate Feedback, Tuned Amplifiers and oscillator circuits using PSPICE.
17C216.5	Simulate wave shape circuits and Power Amplifiers using PSPICE.
17C216.6	Exhibit ethical principles in engineering practices
17C216.7	Perform task as an individual and/ or team member to manage the task in time
17C216.8	Express the engineering activities with effective presentation and report.
17C216.9	Interpret the findings with appropriate technological/ research citation

17C217-EC8462-LINEAR INTEGRATED CIRCUITS LABORATORY

17C217.1	Verify the characteristics of oscillators , amplifiers ,D/A converters using operational amplifiers.
17C217.2	Demonstrate the performance characteristics of filters , Schmitt Trigger and multivibrators using op-amp .
17C217.3	Demonstrate the working of PLL and its application as frequency multiplier.
17C217.4	Demonstrate the working of DC power supply ,multivibrators using timer and study of SMPS.
17C217.5	Simulate filters, multivibrators, A/D converters, analog multipliers using SPICE
17C217.6	Exhibit ethical principles in engineering practices
17C217.7	Perform task as an individual and/ or team member to manage the task in time
17C217.8	Express the engineering activities with effective presentation and report.
17C217.9	Interpret the findings with appropriate technological/ research citation

17C301-EC8501-DIGITAL COMMUNICATION

17C301.1	Explain the basic concepts of discrete memoryless channel and compute the channel efficiency.
17C301.2	Explain the base band signalling schemes and represent their wave forms..
17C301.3	Explain the spectral characteristics of band pass signalling schemes and calculate the Noise power spectral density.
17C301.4	Apply the spectral characteristics of band pass signals to calculate the noise performance of digital communication systems .
17C301.5	Apply error control coding techniques in digital communication systems.

17C302-EC8553-DISCRETE TIME SIGNAL PROCESSING

17C302.1	Explain the concepts of DFT and analyze the Digital signals and systems.
17C302.2	Design and realizations of various filters for Infinite impulse response
17C302.3	Design and realizations of various filters for finite impulse response
17C302.4	Explain the Effects of Finite Precision Representation in Digital Filters
17C302.5	Design the architecture for digital filters appropriately for communication systems

17C303-EC8552-COMPUTER ARCHITECTURE AND ORGANIZATION

17C303.1	Describe data representation, instruction formats and the operation of a digital computer
17C303.2	Illustrate the fixed point and floating-point arithmetic for ALU operation
17C303.3	Explain the implementation schemes of control unit and pipeline performance
17C303.4	Explain the concept of various memories, interfacing and organization of multiple processors
17C303.5	Explain the parallel processing technique and unconventional architectures

17C304-EC8551-COMMUNICATION NETWORKS

17C304.1	Explain the OSI model and its layer responsibilities in detail.
17C304.2	Interpret the medium access protocols used for internetworking.
17C304.3	Make use of the routing algorithms to find the shortest path in a network for data transfer.
17C304.4	Explain the protocols and congestion control mechanisms involved in transport layer
17C304.5	Classify the different application layer protocols and learn its functions.

17C305 (PE-I)-CS8392-OBJECT ORIENTED PROGRAMMING

17C305.1	Summarize Object Oriented Programming concepts and basic characteristics of Java
17C305.2	Build programs using packages, inheritance and interfaces
17C305.3	Develop programs using build , user defined exceptions and with I/O streams
17C305.4	Develop a java application with threads and generics classes
17C305.5	Make use of AWT swing and build simple Graphical User Interfaces

17C306 (PE-I) - EC8073- Medical Electronics

17C306.1	Know the human body electro- physiological parameters and recording of bio-potentials
17C306.2	Comprehend the non-electrical physiological parameters and their measurement
17C306.3	Interpret the various assist devices used in the hospitals viz. pacemakers, defibrillators, dialyzers and ventilators
17C306.4	Comprehend physical medicine methods viz. ultrasonic, shortwave, microwave surgical diathermies , and bio-telemetry principles and methods
17C306.5	Know about recent trends in medical instrumentation

17C307 (PE-I) -EC8074 -Robotics and Automation

17C307.1	Explain the concepts of industrial robots in terms of classification, specifications and coordinate systems, along with the need and application of robots & automation.
17C307.2	Examine different sensors and actuators for applications like maze solving and self driving cars.
17C307.3	Design a 2R robot & an end-effector and solve the kinematics and dynamics of motion for robots
17C307.4	Explain navigation and path planning techniques along with the control architectures adopted for robot motion planning.
17C307.5	Describe the impact and progress in AI and other research trends in the field of Robotics.

17C308 (OE-I)-OMD551-BASIC OF BIOMEDICAL INSTRUMENTATION

17C308.1	Explain the different bio potential generation and its propagation and the different types of electrodes.
17C308.2	Explain bio-signal Characteristics and electrode placement for various bio-signal recording
17C308.3	Construct bio amplifier for various physiological recording
17C308.4	Explain the different measurement techniques for non-physiological parameters
17C308.5	Explain the different biochemical measurements

17C309 (OE-I) -OTL552- Digital Audio Engineering

17C309.1	Explain the concept of fundamentals of digital audio
17C309.2	Explain the concept of audio in digital TV broadcasting
17C309.3	Describe the various codes of digital coding.
17C309.4	Explain the concept of digital audio tape recorder.
17C309.5	Explain the concept internet audio in digital audio engineering

17C310 (OE-I) - OME551- Energy Conservation and Management

17C310.1	Understand and analyse the energy data of industries
17C310.2	Illustrate possible economic measures in electrical systems.
17C310.3	Discuss possible economic measures in thermal systems.
17C310.4	Interpret energy audit and suggest methodologies for energy savings
17C310.5	Explain the payback period for energy conservation opportunities.

17C311-EC8562-DIGITAL SIGNAL PROCESSING LABORATORY

17C311.1	Demonstrate the generation of Discrete Time Signals and signal processing operations
17C311.2	Develop the Programs for Frequency Analysis using DFT
17C311.3	Analyze the performance of IIR and FIR filters to demonstrate the filtering operation
17C311.4	Generate the Discrete Time Signals and perform signal processing operations using DSP processors
17C311.5	Make use of DSP processors to demonstrate the FIR and IIR filter operations
17C311.6	Exhibit ethical principles in engineering practices
17C311.7	Perform task as an individual and/ or team member to manage the task in time
17C311.8	Express the engineering activities with effective presentation and report.
17C311.9	Interpret the findings with appropriate technological/ research citation

17C312-EC8561-COMMUNICATION SYSTEMS LABORATORY

17C312.1	Ability to demonstrate the various functional modules of a communication system
17C312.2	Ability to apply the different analog modulation and digital modulation schemes in communication system and to identify its performance measures.
17C312.3	Apply the various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system .
17C312.4	Ability to simulate the end-to-end communication link and observe the system performance.
17C312.5	Exhibit ethical principles in engineering practices
17C312.6	Perform task as an individual and/ or team member to manage the task in time
17C312.7	Express the engineering activities with effective presentation and report.
17C312.8	Interpret the findings with appropriate technological/ research citation

17C313-EC8563-COMMUNICATION NETWORKS LABORATORY

17C313.1	Implement Error detection /correction techniques.
17C313.2	Implement flow control mechanism using protocols for data transfer in communication networks.
17C313.3	Implement IP Commands and IP address configuration.
17C313.4	Make use of the routing algorithms associated with network layer functions of the OSI model.
17C313.5	simulate cryptographic algorithms and congestion control algorithms.
17C313.6	Exhibit ethical principles in engineering practices
17C313.7	Perform task as an individual and/ or team member to manage the task in time
17C313.8	Express the engineering activities with effective presentation and report.
17C309.9	Interpret the findings with appropriate technological/ research citation

17C314-EC8691-MICROPROCESSOR AND MICROCONTROLLERS

17C314.1	Explain the Architecture of 8086 microprocessors and Demonstrate the programs on 8086 microprocessor
17C314.2	Explain the Bus structure and configuration of 8086 microprocessor
17C314.3	Apply the design aspects of I/O and memory interfacing circuits
17C314.4	Explain the Architecture of 8051 Microcontroller and Demonstrate the programs on 8051 Microcontroller
17C314.5	Develop a simple 8051 microcontroller based systems with its resources and compare different processors and controllers.

17C315-EC8095-VLSI DESIGN

17C315.1	Understand the characteristics of CMOS logic circuits.
17C315.2	Explain about the combinational logic circuits for digital operations and its power dissipation.
17C315.3	Explain about the sequential logic circuits for digital operations and its timing issues.
17C315.4	Develop different circuits of arithmetic building blocks and its memory architecture.
17C315.5	Summarize the building blocks of FPGA and different testing techniques.

17C316-EC8652-WIRELESS COMMUNICATION

17C316.1	Explain the wireless channel characteristics and outline the mobile radio propagation, fading models and parameters.
17C316.2	Develop a cellular system based on resource availability and traffic demands with technical challenges.
17C316.3	Classify the different digital signaling schemes and interpret the performance of signal fading in wireless channels.
17C316.4	Describe suitable signaling and multipath mitigation techniques for the wireless channel and system under consideration.
17C316.5	Explain the various multiple antenna techniques based on MIMO systems in wireless communication and interpret its channel state information's.

17C317-MG8591-PRINCIPLES OF MANAGEMENT

17C317.1	Explain the evolution of management, culture and types of organization
17C317.2	Examine various strategies planning tool and techniques also can take part in decision making process
17C317.3	Interpret the organization structures, line and staff authority and HR management
17C317.4	Build the leadership style ,barriers to effective communication ,it impact and methods to overcome them
17C317.5	Evaluate the controlling techniques to maintain standards in organization

17C318-EC8651-TRAMSMISSION LINES AND RF SYSTEMS

17C318.1	Explain the characteristics of transmission lines and its losses.
17C318.2	Describe about the standing wave ratio and input impedance in high frequency transmission lines.
17C318.3	Make use of smith chart to determine impedance matching by stubs.
17C318.4	Apply the Maxwell's equation to determine the characteristics of TE and TM waves in different waveguides.
17C318.5	Explain the concepts of RF transceiver system for wireless communication

17C319 (PE-II)-EC8004-WIRELESS NETWORKS

17C319.1	Explain the various protocols and standards of wireless LAN.
17C319.2	Describe the Internet protocols and routing procedure in mobile network layer.
17C319.3	Illustrate the various architectures related to 3G services.
17C319.4	Explain wireless inter-networking environment for WLAN and WWAN.
17C319.5	Explain the concept of latest 4G network strategies in Smart phones.

17C320-EC8681-MICROPROCESSOR AND MICRO CONTROLLER LABORATORY

17C320.1	Write programs for arithmetical & logical operations, data transfer and code conversion in 8086.
17C320.2	Develop the programs for sorting and string manipulation in 8086
17C320.3	Contrast how different, I/O devices can be interfaced to processor and explore several techniques of interfacing Analysis
17C320.4	Write programs for arithmetical, logical operations and code conversion in 8051.
17C320.5	Develop the programs using Timer and DAC to generate waveforms
17C320.6	Exhibit ethical principles in engineering practices
17C320.7	Perform task as an individual and/ or team member to manage the task in time
17C320.8	Express the engineering activities with effective presentation and report.
17C320.9	Interpret the findings with appropriate technological/ research citation

17C321-EC8661-VLSI DESIGN LABORATORY

17C321.1	Develop the HDL Code for basic integrated digital circuits
17C321.2	Develop the HDL code for advanced digital integrated digital circuits
17C321.3	Experiment with the FPGA board by transferring the logic modules into it.
17C321.4	Develop, Synthesis, Place and Route the digital IPs
17C321.5	Design, simulate and extract the layouts of Analog IC blocks using EDA tools
17C321.6	Exhibit ethical principles in engineering practices
17C321.7	Perform task as an individual and/ or team member to manage the task in time
17C321.8	Express the engineering activities with effective presentation and report.
17C321.9	Interpret the findings with appropriate technological/ research citation

17C322-EC8611-TECHNIAL SEMINAR

17C322.1	Identify the new ideas and cutting edge technologies in various engineering domain.
17C322.2	Develop teamwork for effective communication and healthy discussion.
17C322.3	Make effective presentation with the usage of modern tools.
17C322.4	Impart skills in preparing detailed report.

17C401-EC8701-ANTENNAS AND MICROWAVE ENGINEERING

17C401.1	Explain the necessary principle and concept for antenna and microwave system design
17C401.2	Classify the various antenna designs and explain its mechanisms
17C401.3	Understand the antenna arrays and applications
17C401.4	Explain about passive and active microwave devices
17C401.5	Develop the microwave system using microwave components

17C402-EC8751-OPTICAL COMMUNICATION AND NETWORKS

17C402.1	Explain the basic fabrication process in optical fibers with different modes &configurations.
17C402.2	Identify the transmission characteristics associated with optical fiber.
17C402.3	Explain the various optical sources, optical detectors and their use in the optical communication system.
17C402.4	Explain fiber optic receiver systems, various measurements & coupling techniques.
17C402.5	Choose an optical communication system and its networks.

17C403-EC8791-EMBEDDED AND REAL TIME SYSTEMS

17C403.1	Explain the concepts of embedded system design and analysis
17C403.2	Describe the architecture and programming of ARM processor
17C403.3	Outline the concepts of embedded systems
17C403.4	Explain the basic concepts of real time operating system design
17C403.5	Describe the model real-time applications using embedded-system concepts

17C404-EC8702-ADHOC AND WIRELESS SENSOR NETWORKS

17C404.1	Understand the basics of Ad hoc networks and Wireless Sensor Networks
17C404.2	Identify the suitable routing algorithm based on the network and user requirement
17C404.3	Explain the physical and MAC layer protocols
17C404.4	Describe the transport layer and security issues possible in Ad hoc and sensor networks.
17C404.5	Explain the OS in Wireless Sensor Networks and build basic modules

17C405 (PE-III)-EC8071-COGNITIVE RADIO

17C405.1	Gain knowledge on the evolution of software defined radio and cognitive radio.
17C405.2	Explain the Cognitive radio architecture and its features that suit for wireless communication standards.
17C405.3	Explain the spectrum sensing techniques and dynamic spectrum access with its limits.
17C405.4	Apply the media access control techniques in cognitive radio and make use of the routing methods to attain high throughput in CR network performance.
17C405.5	Apply the knowledge of advanced features of cognitive radio for real world applications.

17C406 (PE-III)- GE8071- Disaster Management

17C406.1	Classify the types of disasters, causes and their impact on environment and society
17C406.2	Understand the approaches to disaster risk reduction.
17C406.3	Examine the vulnerability factors and use of indigenous knowledge in combating disaster.
17C406.4	Examine the hazard and vulnerability profile of India and also examine components of relief, preparedness, Institutional arrangements to combat risk.
17C406.5	Analyse the case studies of natural and man-made disasters

17C407 (OE-II) -OBM752- Hospital Management

17C407.1	Interpret the principles of Hospital Management
17C407.2	Identify the importance of Human resource Management
17C407.3	Infer the training methods and their evaluations.
17C407.4	Categorize the various departments in hospital.
17C407.5	Outline the safety procedures followed in hospitals.

17C408 (OE-II)-OIC751-TRANSDUCER ENGINEERING

17C408.1	Classify various types of transducers
17C408.2	Explain the static and dynamic characteristics of Transducers.
17C408.3	Demonstrate different types of resistive transducers and their application areas.
17C408.4	Explain the different types of inductive and capacitive transducers.
17C408.5	Explain Piezoelectric, Hall effect, magneto elastic, MEMS and Smart transducers

17C409-EC8711-EMBEDDED LABORATORY

17C409.1	Practice to write the programs for ARM based applications.
17C409.2	Demonstrate the memory operations, A/D & D/A convertors using ARM system
17C409.3	Analyze the interrupt functions in ARM based systems.
17C409.4	Demonstrate the keyboard, display, motor and sensor interfacing units.
17C409.5	Design an ARM based system as a mini project.
17C409.6	Exhibit ethical principles in engineering practices
17C409.7	Perform task as an individual and/ or team member to manage the task in time
17C409.8	Express the engineering activities with effective presentation and report.
17C409.9	Interpret the findings with appropriate technological/ research citation

17C410-EC8761-ADVANCED COMMUNICATION LABORATORY

17C410.1	Show the DC characteristic of LED and photo diode.
17C410.2	Demonstrate the performance of analog and digital optical link.
17C410.3	Discover the Wireless Channel Characteristics and Analyze the performance of Wireless Communication System
17C410.4	Demonstrate the characteristics of various microwave active and passive components.
17C410.5	Demonstrate the microwave parameters such as frequency, wavelength, VSWR and radiation pattern.
17C410.6	Exhibit ethical principles in engineering practices
17C410.7	Perform task as an individual and/ or team member to manage the task in time
17C410.8	Express the engineering activities with effective presentation and report.
17C410.9	Interpret the findings with appropriate technological/ research citation

17C411 (PE-IV)-EC8093 DIGITAL IMAGE PROCESSING

17C411.1	Know and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.
17C411.2	Operate on images using the techniques of smoothing, sharpening and enhancement.
17C411.3	Understand the restoration concepts and filtering techniques.
17C411.4	Learn the basics of segmentation, features extraction.
17C411.5	Become familiar with image compression and recognition methods for color models.

17C412 (PE-V)-EC8094 SATELLITE COMMUNICATION

17C412.1	Describe about satellite orbits
17C412.2	Explain the satellite segment and earth segment.
17C412.3	Describe the concepts of satellite access.
17C412.4	Explain the applications of satellite.
17C412.5	Explain the concept of satellite network

17C413-EC6811 PROJECT WORK

17C413.1	Use literature to identify the objective, scope and the concept of the work
17C413.2	Apply suitable methods and materials to carry out experiments by conserving eco-system
17C413.3	Develop a prototype-experimental set-up necessary to complete the project
17C413.4	Discuss the results obtained to derive conclusions
17C413.5	Defend the work by preparing a report as per the University format.
17C413.6	Assess health, safety and legal relevant to professional engineering practices.
17C413.7	Comply the environmental needs and sustainable development.
17C413.8	Justify ethical principles in engineering practices
17C413.9	Perform multi-disciplinary task as an individual and - or team member to manage the project-task.
17C413.10	Comprehend the Engineering activities with effective presentation and report.
17C413.11	Interpret the findings with appropriate technological - research citation

HOD **PRINCIPAL**