

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION  
ENGINEERING**

**List of Subjects:(Regulation 2017)**

S.No.	Course code	Subject code	Course Name
<b>Semester I</b>			
1.	C101	HS8151	Communicative English
2.	C102	MA8151	Engineering Mathematics – I
3.	C103	PH8151	Engineering Physics
4.	C104	CY8151	Engineering Chemistry
5.	C105	GE8151	Problem Solving and Python Programming
6.	C106	GE8152	Engineering Graphics
7.	C107	GE8161	Problem Solving and Python Programming Laboratory
8.	C108	BS8161	Physics and Chemistry Laboratory
<b>Semester II</b>			
9.	C109	HS8251	Technical English
10.	C110	MA8251	Engineering Mathematics – II
11.	C111	PH8253	Physics for Electronics Engineering
12.	C112	BE8254	Basic Electrical and Instrumentation Engineering
13.	C113	EC8251	Circuit Analysis
14.	C114	EC8252	Electronic Devices
15.	C115	EC8261	Circuits and Devices Laboratory
16.	C116	GE8261	Engineering Practices Laboratory
<b>Semester III</b>			
17.	C201	MA8352	Linear Algebra and Partial Differential Equation
18.	C202	EC8393	Fundamentals of Data Structures in C
19.	C203	EC8351	Electronic Circuits-I
20.	C204	EC8352	Signals and Systems
21.	C205	EC8392	Digital Electronics
22.	C206	EC8391	Control System Engineering
23.	C207	EC8381	Fundamentals of Data Structures in C Laboratory
24.	C208	EC8361	Analog and Digital Circuits Laboratory
25.	C209	HS8381	Interpersonal Skills/Listening & Speaking
<b>Semester IV</b>			
26.	C210	MA8451	Probability and Random Processes
27.	C211	EC8452	Electronic Circuits II
28.	C212	EC8491	Communication Theory
29.	C213	EC8451	Electromagnetic Fields
30.	C214	EC8453	Linear Integrated Circuits

31.	C215	GE8291	Environmental Science and Engineering
32.	C216	EC8461	Circuit Design and Simulation Laboratory
33.	C217	EC8462	Linear Integrated Circuits Laboratory
<b>Semester V</b>			
34.	C301	EC8501	Digital Communication
35.	C302	EC8553	Discrete Time Signal Processing
36.	C303	EC8552	Computer Architecture and Organization
37.	C304	EC8551	Communication Networks
38.	C305	EC8073	Medical Electronics
39.	C306	OMD551	Basics of Biomedical Instrumentation
40.	C307	EC8562	Digital Signal Processing Laboratory
41.	C308	EC8561	Communication system Laboratory
42.	C309	EC8563	Communication Networks Laboratory
<b>Semester VI</b>			
43.	C310	EC8691	Microprocessors and Microcontrollers
44.	C311	EC8095	VLSI Design
45.	C312	EC8652	Wireless Communication
46.	C313	MG8591	Principles of Management
47.	C314	EC8651	Transmission Lines and RF Systems
48.	C315		
49.	C316	EC8681	Microprocessors and Microcontrollers Laboratory
50.	C317	EC8661	VLSI Design Laboratory
51.	C318	EC8611	Technical Seminar

**Course Outcomes of all subjects**  
**SEMESTER I**

<b>COMMUNICATIVE ENGLISH: C101</b>	
C101.1	Understand clearly, confidently, comprehensibly, and communicate with one or many listeners using appropriate communicative strategies
C101.2	Analyzing cohesively and coherently and flawlessly avoiding grammatical errors, using a wide vocabulary range, organizing their ideas logically on a topic
C101.3	Create different genres of texts adopting various reading strategies
C101.4	Understand different spoken discourses and different accents
C101.5	Understand intonations of the speaker while communicating as well as development of creative writing.

<b>ENGINEERING MATHEMATICS - I: C102</b>	
C102.1	Use both the limit definition and rules of differentiation to differentiate functions. Apply differentiation to solve maxima and minima problems.
C102.2	Evaluate integrals both by using Riemann sums and by using the Fundamental Theorem of Calculus.
C102.3	Apply integration to compute multiple integrals, area, volume, integrals in polar coordinates, in addition to change of order and change of variables.
C102.4	Evaluate integrals using techniques of integration, such as substitution, partial fractions and integration by parts.

C102.5	Apply various techniques in solving differential equations.
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<b>ENGINEERING PHYSICS: C103</b>	
C103.1	Gain knowledge on the properties of matter and its applications.
C103.2	Understand the concepts of waves and optical devices and its applications.
C103.3	Analyze the thermal properties of materials and their applications
C103.4	To get knowledge about advanced physics concepts of quantum theory
C103.5	Achieve the knowledge about various crystals structures and its growth techniques.

<b>ENGINEERING CHEMISTRY: C104</b>	
C104.1	Gain knowledge on the water quality parameters.
C104.2	Understand the types of catalysis & Identify the applications of adsorption.
C104.3	Analyse the types of phase in a system and various alloys
C104.4	Evaluate the characteristics of various fuels & its applications.
C104.5	Achieve the knowledge about various energy sources & its applications.

<b>PROBLEM SOLVING AND PYTHON PROGRAMMING: C105</b>	
C105.1	Develop algorithmic solutions to simple computational problems
C105.2	Read, write, execute by hand simple Python programs.
C105.3	Decompose a Python program into functions.
C105.4	Represent compound data using Python lists, tuples, and dictionaries.
C105.5	Read and write data from/to files in Python Programs.

<b>ENGINEERING GRAPHICS: C106</b>	
C106.1	Effectively understand the practical applications of conics, special curves and freehand sketching.
C106.2	Implement the drawing skills in points, lines and planes.
C106.3	Enhance the solid projections in pyramid, prisms, cylinder and cones.
C106.4	Understand clearly the concepts of sectioning and development of solids in pyramid, prisms, cylinder and cones.
C106.5	Improve the engineering knowledge in frustrum & truncated solids, visual ray methods.

<b>PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY: C107</b>	
C107.1	Develop algorithmic solutions to simple computational problems, Write, test, and debug simple Python programs.
C107.2	Read, write, execute by handle simple Python programs, Implement Python programs with conditionals and loops.
C107.3	Develop Python programs step-wise by defining functions and calling them.
C107.4	Use Python lists, tuples, dictionaries for representing compound data.
C107.5	Read and write data from/to files in Python

<b>PHYSICS AND CHEMISTRY LABORATORY: C108</b>	
C108.1	Analyse the characteristics of engineering materials.
C108.2	Find out the physical properties of matter.
C108.3	Assess the water quality parameter.
C108.4	Analyse the pH of aqueous solutions.
C108.5	Gain knowledge on chemical properties of liquids.

### Semester II

<b>TECHNICAL ENGLISH: C109</b>	
C109.1	Speak convincingly, express their opinions clearly, initiate a discussion, negotiate, and argue using appropriate communicative strategies.
C109.2	Recognize to frame effective types of writing such as narration, description, exposition and argument as well as creative, critical, analytical and evaluative writing to determine their writing skill.
C109.3	Attribute to read different genres of texts, infer implied meanings and critically analyse and evaluate them for ideas as well as for method of presentations.
C109.4	Listen different spoken excerpts critically and infer unspoken and implied meanings
C109.5	Analyze to participantinagroupdiscussion and understandingtechnicalarticles.

<b>ENGINEERING MATHEMATICS II: C110</b>	
C110.1	Eigen values and eigenvectors, Diagonalization of a matrix, Symmetric matrices, Positivedefinite matrices and similar matrices
C110.2	Generalize about vector differentiation, line, surface and volume integrals and theorems involving them.
C110.3	Examine analytic functions and its properties, conformal mapping and its applications.
C110.4	Summarize the concepts of complex integration.
C110.5	Use knowledge of Laplace transform and its properties, inverse Laplace transform to solve linear differential equations.

<b>PHYSICS FOR ELECTRONICS ENGINEERING: C111</b>	
C111.1	To study the Electrical and thermal conductivity of the metal And also gain knowledge on the basics of conducting materials and its applications.
C111.2	To learn the acquire knowledge on the concepts of electrons, holes, Hall effect, semiconductor and their applications.
C111.3	To learn the adequate knowledge on the concepts of magnetic, dielectric, ferro electric materials and its applications.
C111.4	To analysis the Photo diode, Solar cell, LED, OLED and LASER diode and its applications.
C111.5	To understand the basics of quantum well, quantum wire and quantum dots, spintronics, SET, CNT and their applications.

<b>BASIC ELECTRICAL AND INSTRUMENTATION ENGINEERING: C112</b>	
C112.1	Apply the basic concept of three phase power circuits and measurement.
C112.2	Analysis and calculate performance parameters of transformer.
C112.3	Compare the various performance and types of dc machines.
C112.4	Analysis the performance characteristics of various ac machines.
C112.5	Choose appropriate measuring instruments for given application.

<b>Circuit Analysis: C113</b>	
C113.1	Analyze the basics of Circuits and its topology.
C113.2	Reduce the DC and AC circuits using network theorems.
C113.3	Attain the resonance condition of coupled circuits with bandwidth, q-factors.
C113.4	Analyse the transient circuits and transient analysis of Passive elements.
C113.5	Examine the concepts of two port networks and its symmetrical properties.

<b>Circuits and Devices Laboratory: C115</b>	
C115.1	To Analyze the characteristics of basic electronic devices and get basic knowledge about its working
C115.2	To understand RL and RC circuits and its usage in various applications.
C115.3	To implement circuits with Norton and Thevinin theorem and to calculate the equivalent voltage and current
C115.4	To Evaluate and verify KVL, KCL and superposition theorems.
C115.5	To Design resonance frequency of series and parallel RLC circuits

<b>ENGINEERING PRACTICES LABORATORY: C116</b>	
C116.1	Able to use wiring circuit for Residential house, Fluorescent lamp and Stair case
C116.2	Identify the electrical quantities of V,I & PF in RLC and energy with single phase energy meter
C116.3	Demonstrate logic gates and electronic components
C116.4	Demonstrate PCB with electronic components, devices, circuit for general purposes
C116.5	Demonstrate HWR & FWR with ripple factor & test for generation of clock

<b>Electronic Devices: C114</b>	
C114.1	Gain the Knowledge about the basic of diodes with input output characteristics and applications and deal with the basic electronic devices such as PN junction diode
C114.2	Ability to Evaluate the Semiconductor devices display devices and analysis the various components such as Bipolar and Field effect Transistors

C114.3	Understand about equivalence Junction Field effect Transistors and Metal oxide field effect transistor circuits and solve simple design techniques problems
C114.4	Design and development the knowledge of the basic electronic devices such as PN Junction diode Bipolar and Field effect Transistors, Power Electronic devices
C114.5	Attain the power control devices, opto electronic devices & components used in Various multiple communication system

### Semester III

<b>Linear Algebra and Partial Differential Equation: C201</b>	
C201.1	Explain the fundamental concepts of advanced algebra and their role in modern mathematics and applied contexts.
C201.2	Demonstrate accurate and efficient use of advanced algebraic techniques.
C201.3	Demonstrate their mastery by solving non - trivial problems related to the concepts and by proving simple theorems about the statements proven by the text.
C201.4	Able to solve various types of partial differential equations. Able to solve engineering problems using Fourier series.
C201.5	Able to solve various types of application of partial differential equations. Able to solve engineering problems using Fourier series.

<b>Fundamentals of Data Structures in C: C202</b>	
C202.1	Implement linear and non-linear data structure operations using C
C202.2	Suggest appropriate linear / non-linear data structure for any given data set
C202.3	Apply hashing concepts for a given problem
C202.4	Modify or suggest new data structure for an application
C202.5	Appropriately choose the sorting algorithm for an application

<b>Electronic Circuits-I: C203</b>	
C203.1	Design different applications using BJT, JFET and MOSFET amplifier.
C203.2	Implement the Frequency response characteristics of BJT and FET amplifiers
C203.3	Analyze the performance of small signal BJT and FET amplifiers - single stage and multi stage amplifiers.
C203.4	Design high frequency model of MOSFET amplifier
C203.5	Apply the knowledge gained in the design of Electronic circuits

<b>Signals and Systems: C204</b>	
C204.1	Gain the knowledge of types of signals & systems and their properties.
C204.2	Understanding and applying the concept of Fourier series Trigonometric, cosine, exponential representation CT and DT signal analysis
C204.3	Applying Fourier and Laplace Transforms and Direct form-I,II,Serial ,parallel form Structures LTI systems

C204.4	Applying Z transform and inverse Z transform properties and DTFT properties in DTI signal analysis
C204.5	Analyze discrete time with recursive and non recursive systems. Applying convolution property in LTI systems

<b>Digital Electronics: C205</b>	
C205.1	Familiarize with the fundamentals and minimization techniques of Digital Logic circuits
C205.2	Design the combinational logic circuits using different logic gates.
C205.3	Design the synchronous and asynchronous sequential logic circuits using diverse Flipflops
C205.4	Understand the various state types to obtain error free circuit
C205.5	Know the various memory elements in digital logic circuits

<b>Control System Engineering: C206</b>	
C206.1	Analyze the elements of control system and their modeling
C206.2	Perform time domain analysis of control systems
C206.3	Perform frequency domain analysis of control systems
C206.4	Analyze the various methods of control system required for stability
C206.5	Examine the control system using state variable analysis

<b>Fundamentals of Data Structures in C Laboratory: C207</b>	
C207.1	Write basic and advanced programs in C
C207.2	Implement functions and recursive functions in C
C207.3	Implement data structures using C
C207.4	Choose appropriate sorting algorithm for an application and implement it in a modularized way
C207.5	Design the non linear data structures for implementing solutions to practical problems.

<b>Analog and Digital Circuits Laboratory: C208</b>	
C208.1	Design and evaluate the performance of regulated power supplies using BJT
C208.2	Analyze the frequency response of various types of BJT Amplifiers
C208.3	Estimate the bandwidth of single stage and multi stage amplifier and measure the CMRR
C208.4	Evaluate the performance of various amplifier circuits such as BJT, FET and MOSFET using PSpice
C208.5	Apply the fundamental of digital theory and implement various types of combinational and sequential logic circuits

<b>Interpersonal Skills/Listening &amp; Speaking C209</b>	
C209.1	Acquire the listening skills to lead successful career in their work place.
C209.2	Attain articulation knowledge on native speaker- like intonation, rhythm and stress.
C209.3	Identify appropriate vocabulary and correct words to reply others.
C209.4	Understand key skills and behavior required to facilitate a group discussion
C209.5	Participate confidently and appropriately in presentation

### Semester IV

<b>Probability and Random Processes: C210</b>	
C210.1	Understand the basic concepts of Probability to solve real life application
C210.2	Utilize correlation and linear regression to solve real life application
C210.3	Apply random signals to solve real life application
C210.4	Understand and characterize phenomena which evolve with respect to time in Probabilistic manner
C210.5	Utilize linear systems in communication engineering.

<b>Electronic Circuits II:C211</b>	
C211.1	Gain a knowledge on basic structure of feedback amplifier and students able to design the various feedback amplifier circuits.( Current series, Current shunt, Voltage series and Voltage shunt )
C211.2	Understand the Design procedure of Oscillator circuits based on transistor and they have the ability to construct (LC,RC&Crystal) oscillator circuits
C211.3	Analyze the frequency response of single tuned and double tuned amplifier with the help of their equivalent circuits.
C211.4	Apply the pulse triggering mechanism on transistor to design Multivibrator circuits such as Astable, Monostable and Bistable and analyze their output response.
C211.5	Create a power amplifier circuits and implement them with the MOSFET.

<b>Communication Theory:C212</b>	
C212.1	Design AM communication systems
C212.2	Design Angle modulated communication systems
C212.3	Apply the concepts of Random Process to the design of Communication systems
C212.4	Analyse the noise performance of AM and FM systems
C212.5	Gain knowledge in sampling and quantization

<b>Electromagnetic Fields: C213</b>	
C213.1	Demonstrate the concepts using vector algebra, Co ordinate Systems and Theorems associated with Electromagnetism.
C213.2	Explain and analyze the behaviour of Electric Fields in Conductors.
C213.3	Evaluate various parameters related to the behaviour of Materials in Magnetic fields

C213.4	Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning
C213.5	Explain electromagnetic wave propagation in lossy and in lossless media

<b>Linear Integrated Circuits C214</b>	
C214.1	Understand the basic building blocks and characteristics of linear integrated circuits
C214.2	Recognize the linear and non-linear applications of operational amplifiers
C214.3	Know concept of analog multipliers and PLL and their applications
C214.4	Realize A/D Converter and D/A Converter using op-amp
C214.5	Acquire the knowledge of various waveform generators and special function ICs

<b>Environmental Science and Engineering: C215</b>	
C215.1	Gain knowledge on public awareness & about the Environment & Ecosystem
C215.2	Understand the impacts of Pollution.
C215.3	Attain Sustainable development.
C215.4	Able to analyze about the social issues in the Environment.
C215.5	Apply the knowledge to tackle the problems of over population

<b>Circuit Design and Simulation Laboratory C216</b>	
C216.1	Gain the knowledge on various types of feedback amplifiers and their operations
C216.2	Understand the working principle of different type of oscillators, tuned amplifiers
C216.3	Apply the knowledge to design wave-shaping circuits and multivibrators
C216.4	Investigate the working principle of simulation SPICE tool to design feedback amplifiers
C216.5	Implement simulation results of tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool

<b>Linear Integrated Circuits Laboratory C217</b>	
C217.1	Design oscillators and amplifiers using operational amplifiers
C217.2	Experiment with filters using Opamp and perform experiment on frequency response.
C217.3	Analyze the ADC, DAC and working of PLL and use PLL as frequency multiplier.
C217.4	Build DC power supply using ICs
C217.5	Design the performance of oscillators and multivibrators using SPICE

### Semester V

<b>Digital Communication: C301</b>	
C301.1	Gain the knowledge about the basic principles of Information Theory techniques
C301.2	Design and implement the various waveform digital coding schemes with its applications
C301.3	Learn and analyze the different basic baseband schemes with errorless transmission.
C301.4	Illustrate the spectral characteristics of pass band signaling and their noise performance.

C301.5	Ability to evaluate the encoder and decoder technique with error control coding schemes.
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<b>Discrete Time Signal Processing: C302</b>	
C302.1	Apply DFT for the analysis of digital signals & systems
C302.2	Able to Design IIR and FIR filter
C302.3	Characterize the effects of finite precision representation on digital filters
C302.4	Design multirate filters
C302.5	Apply adaptive filters appropriately in communication systems

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

<b>Communication Networks: C304</b>	
C304.1	Describe the structure and organization of computer networks; including the division into network layers, role of each layer, and relationships between the layers.
C304.2	Analyze the link layer concepts of error-detection and correction techniques, multiple access protocols, point-to-point protocols and characteristics of link layer media (including wireless links)
C304.3	Explain the transport layer concepts and protocol design including connection oriented and connection-less models, techniques to provide reliable data delivery and algorithms for congestion control and flow control
C304.4	Apply subnetting and supernetting concepts to maintain networks and explain the network layer concepts and protocol design including datagram forwarding, routing algorithms, and network interconnections.
C304.5	Explain the basic concepts of application layer protocol design including client/server models, peer-to-peer models, and network naming.

<b>Medical Electronics: C305</b>	
C305.1	<b>Acquire</b> knowledge about anatomy and physiology of important physiological system of human body.
C305.2	<b>Understand</b> the design of medical instruments by evaluating medical parameter measurement constraint.
C305.3	<b>Analyze</b> important vital sign parameters to evaluate certain disease conditions.
C305.4	<b>Emphasize</b> the implementation of the electric safety of the medical instruments and the role of communication in medical.
C305.5	<b>Know</b> the usage of various medical instruments and recent trends in medical instrumentation.

<b>Basics of Biomedical Instrumentation C306</b>	
C306.1	Analyze the different bio potential and its propagation.
C306.2	Familiarize the different electrode placement for various physiological recording.
C306.3	Recognize the design of bio amplifier for various physiological recording.
C306.4	Determine the various technique non electrical physiological measurements.
C306.5	Understand the different biochemical measurements.

<b>Digital Signal Processing Laboratory C307</b>	
C307.1	Apply the mathematical function and simulate linear , circular convolution
C307.2	Design FIR filters for various applications using windowing techniques
C307.3	Simulate the different applications of IIR filters
C307.4	Demonstrate their abilities towards DSP processor based implementation of DSP systems
C307.5	Implement adaptive filters for various applications of DSP analyze Finite word length effect on DSP systems

<b>Communication system Laboratory: C308</b>	
C308.1	Visualize the different frequency of signals in sampling and reconstruct the original signals and TDM
C308.2	Demonstrate AM and FM modulation and Demodulation schemes.
C308.3	Design PCM & DM modulation and demodulation
C308.4	Analyze base band signaling schemes through implementation of digital modulation schemes.
C308.5	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system

<b>Communication Networks Laboratory: C309</b>	
C309.1	Analyse the communication between PC's
C309.2	Implement the different protocols
C309.3	Implement the programs using sockets
C309.4	Analyse various routing algorithms.
C309.5	Utilize the simulation tool

## Semester VI

<b>Microprocessors and Microcontrollers C310</b>	
C310.1	Understand and execute programs based on 8086 microprocessor.
C310.2	Design Memory Interfacing circuits.
C310.3	Design and interface I/O circuits.
C310.4	Design and implement 8051 microcontroller based systems.
C310.5	Analyze Memory Interfacing circuits with 8051 Microcontrollers

<b>VLSI Design C311</b>	
C311.1	Realize the concepts of digital building blocks using MOS transistor.
C311.2	Design combinational MOS circuits and power strategies.
C311.3	Design and construct Sequential Circuits and Timing systems.
C311.4	Design arithmetic building blocks and memory subsystems.
C311.5	Apply and implement FPGA design flow and testing.

<b>Wireless Communication C312</b>	
C312.1	Characterize a wireless channel and evolve the system design specifications
C312.2	Design a cellular system based on resource availability and traffic demands
C312.3	Identify suitable signalling for Fading Channels multipath mitigation techniques for the wireless channel and system under consideration.
C312.4	Identify suitable multipath mitigation techniques for the wireless channel and system under consideration.
C312.5	Design Multiple Antennas based on MIMO Systems

<b>Principles of Management C313</b>	
C313.1	Gain knowledge on the management and organization from the principles of management
C313.2	Know the concepts of the planning and also strategic and decision making steps and process
C313.3	Understand the organizing and HR planning, recruitment, selection, training and development.
C313.4	Recognize the directing and also effective communication from the principles of management
C313.5	Apply the controlling technique in productivity problems of the management.

<b>Transmission Lines and RF Systems C314</b>	
C314.1	Explain the characteristics of transmission lines and its losses
C314.2	Write about the standing wave ratio and input impedance in high frequency transmission lines
C314.3	Analyze impedance matching by stubs using smith charts
C314.4	Analyze the characteristics of TE and TM wave

C314.5	Design a RF transceiver system for wireless communication
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<b>Microprocessors and Microcontrollers Laboratory C316</b>	
C316.1	Write ALP Programmes for fixed and Floating Point and Arithmetic operations
C316.2	Interface different I/Os with processor
C316.3	Generate waveforms using Microprocessors
C316.4	Execute Programs in 8051
C316.5	Explain the difference between simulator and Emulator

<b>VLSI Design Laboratory C317</b>	
C317.1	Write HDL code for basic as well as advanced digital integrated circuit
C317.2	Import the logic modules into FPGA Boards
C317.3	Synthesize Place and Route the digital IPs
C317.4	Design, Simulate and Extract the layouts of Digital IC Blocks using EDA tools
C317.5	Design, Simulate and Extract the layouts of Analog IC Blocks using EDA tools