

ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

B.E Electronics and Communication Engineering

Anna University Regulation 2021

List of Course Names

S.No.	Sem	Course code	Course	Course Title
1.	1	21C101	HS3151	Professional English – I
2.	1	21C102	MA3151	Matrices and Calculus
3.	1	21C103	PH3151	Engineering Physics
4.	1	21C104	CY3151	Engineering Chemistry
5.	1	21C105	GE3151	Problem Solving and Python Programming
6.	1	21C106	GE3152	Heritage of Tamils
7.	1	21C107	GE3171	Problem Solving and Python Programming Laboratory
8.	1	21C108	BS3171	Physics and Chemistry Laboratory
9.	1	21C109	GE3172	English laboratory
10.	2	21C110	HS3251	Professional English - II
11.	2	21C111	MA3251	Statistics and Numerical Methods
12.	2	21C112	PH3254	Physics for Electronics Engineering
13.	2	21C113	BE3254	Electrical and Instrumentation Engineering
14.	2	21C114	GE3251	Engineering Graphics
15.	2	21C115	EC3251	Circuit Analysis
16.	2	21C116	GE3252	Tamils and Technology
17.	2	21C117	GE3271	Engineering Practices Laboratory
18.	2	21C118	EC3271	Circuits Analysis Laboratory
19.	2	21C119	GE3272	Communication Laboratory / Foreign Language \$
20.	3	21C201	MA3355	Random Processes and Linear Algebra
21.	3	21C202	CS3353	C Programming and Data Structures
22.	3	21C203	EC3354	Signals and Systems

23.	3	21C204	EC3353	Electronic Devices and Circuits
24.	3	21C205	EC3351	Control Systems
25.	3	21C206	EC3352	Digital Systems Design
26.	3	21C207	EC3361	Electronic Devices and Circuits Laboratory
27.	3	21C208	CS3362	C Programming and Data Structures Laboratory
28.	3	21C209	GE3361	Professional Development
29.	4	21C210	EC3452	Electromagnetic Fields
30.	4	21C211	EC3401	Networks and Security
31.	4	21C212	EC3451	Linear Integrated Circuits
32.	4	21C213	EC3492	Digital Signal Processing
33.	4	21C214	EC3491	Communication Systems
34.	4	21C215	GE3451	Environmental Sciences and Sustainability
35.	4	21C216	EC3461	Communication Systems Laboratory
36.	4	21C217	EC3462	Linear Integrated Circuits Laboratory

ROHINI COLLEGE OF ENGINEERING AND TECHNOLOGY
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

Anna University Regulation 2021

B.E Electronics and Communication Engineering

Course Outcomes (CO)

21C101 - HS3151 Professional English – I

CO. No.	Course Outcomes
21C101.1	Express, listen and comprehend complex academic texts
21C101.2	Identify and infer the denotative and connotative meanings of technical texts
21C101.3	Construct definitions, descriptions, narrations and essays on various topics
21C101.4	Demonstrate fluently and accurately informal and informal communicative contexts
21C101.5	Interpret their opinions effectively in both oral and written medium of communication

21C102 - MA3151 Matrices and Calculus

CO. No.	COURSE OUTCOMES
21C102.1	Apply matrix algebra methods for solving practical problems.
21C102.2	Apply differential calculus tools in solving various application problems.
21C102.3	Apply differential calculus ideas on several variable functions.
21C102.4	Apply different methods of integration in solving practical problems.
21C102.5	Apply multiple integral ideas in solving areas, volumes and other practical problems.

21C103 - PH3151 Engineering Physics

CO.No.	Course Outcomes
21C103.1	Explain the importance of Mechanics
21C103.2	Demonstrate the knowledge of Electromagnetic waves and its applications.
21C103.3	Understand the fundamentals in Oscillations, Optics and Laser.
21C103.4	Extend the importance of Quantum Physics.
21C103.5	Explain the quantum mechanical principles towards the formation of energy bands.

21C104 – CY3151 Engineering Chemistry

CO. No	Course Outcomes
21C104.1	Summarize the water quality parameters and their treatment techniques.
21C104.2	Describe the preparation and applications of nano materials.
21C104.3	Interpret the importance of phase diagrams and composites in the field of material science and engineering.
21C104.4	Illustrate the quality of fuel by its properties.
21C104.5	Illustrate the methods of harnessing energy from non-conventional energy sources.

21C105 – GE3151 Problem Solving and Python Programming

CO. No	Course Outcomes
21C105.1	Understand the concepts of algorithmic problem solving techniques and find solutions to simple computational problems.
21C105.2	Illustrate about python interpreter and develop simple python programs.
21C105.3	Develop simple Python programs using conditionals, loops and functions for solving problems.
21C105.4	Utilize Python data structures like lists, tuples, and dictionaries to represent complex data.
21C105.5	Develop simple python programs to read and write data from/to files.

21C107 - GE3151 Problem Solving and Python Programming Laboratory

CO. No	Course Outcomes
21C107.1	Build algorithmic solutions to simple computational problems
21C107.2	Apply conditionals and loops for solving problems using Python.
21C107.3	Utilize functions to decompose a Python program
21C107.4	Make use of compound data using Python data structures.
21C107.5	Apply Python packages in developing software applications.
21C107.6	Exhibit ethical principles in engineering practices
21C107.7	Perform task as an individual and/ or team member to manage the task in time
21C107.8	Express the engineering activities with effective presentation and report.
21C107.9	Interpret the findings with appropriate technological/ research citation

21C108- BS3171 Physics and Chemistry Laboratory

CO. No	Course Outcomes
21C108.1	Explain the physical parameters such as thickness of a wire, band gap of semiconductor both individually and by team by using experiments
21C108.2	Compare the Young's modulus and Rigidity modulus of different materials
21C108.3	List the velocity of ultrasonic waves in different liquids like water and kerosene
21C108.4	Estimate strength of acids quantitatively based on the conductance and PH level of the solution both individually and in teams
21C108.5	Estimate water quality parameters such as dissolved oxygen content, chloride content and iron content of the water samples both individually and in teams
21C108.6	Exhibit ethical principles in engineering practices
21C108.7	Perform task as an individual and / or team member to manage the task in time
21C108.8	Express the Engineering activities with effective presentation and report
21C108.9	Interpret the findings with appropriate technological / research citation.

21C110 - HS3251 Professional English – II

CO No.	Course Outcomes
21C110.1	Associate learners in meaningful language activities to improve their LSRW skills
21C110.2	Extend learners' awareness of general rules of writing for specific audience
21C110.3	Modify learners to understand the purpose, audience, contexts of different types of writing
21C110.4	Construct analytical thinking skills for problem solving in communicative contexts
21C110.5	Extend an understanding of job applications and interviews for internship and placements

21C111- MA3251 Statistics and Numerical Methods

CO No.	Course Outcomes
21C111.1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
21C111.2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
21C111.3	Appreciate the numerical techniques of interpolation in various intervals and apply the numerical techniques of differentiation and integration for engineering problems.
21C111.4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
21C111.5	Solve the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications..

21C112 - PH3254 Physics for Electronics Engineering

CO No.	Course Outcomes
21C112.1	Understand the basics of crystallography and its importance in studying materials properties.
21C112.2	Understand the electrical and magnetic properties of a material
21C112.3	Understand the physics of semiconductor and its functioning
21C112.4	Explain the optical properties of materials and understand the various optical devices
21C112.5	Interpret the different quantum structures and Nano devices.

21C113 – BE3254 Electrical and Instrumentation Engineering

CO No.	Course Outcomes
21C113.1	Apply the concept of three phase circuits in power system.
21C113.2	Describe the working and performance characteristics of static AC machine.
21C113.3	Explain the construction and working of DC machines.
21C113.4	Summarize the construction and working of various AC machines.
21C113.5	Discuss the working of various measuring instrument

21C114 – GE3251 Engineering Graphics

CO.NO	Course Outcomes
21C114.1	Discuss and draw the various conic curves
21C114.2	Relate to basic principles of orthographic projection for drawing projection of points, lines and planes.
21C114.3	Discuss orthographic principle and apply basic principles of orthographic projection for drawing projection of solids like prisms, pyramids, cone and cylinder.
21C114.4	Show the sectioned view of solids and the development of solid surfaces
21C114.5	Show the isometric projection and perspective views for simple solids.

21C115 - EC3251 CIRCUIT ANALYSIS

CO. No	Course Outcomes
21C115.1	Describe the basics concepts of Electric circuits.
21C115.2	Explain the concept of network theorem and duality.
21C115.3	Discuss the steady state response of any R, L and C circuits.
21C115.4	Summarize transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits.
21C115.5	Describe the coupled circuits and network topologies

21C117 - GE 3271 ENGINEERING PRACTICES LABORATORY

CO No.	Course Outcomes
21C117.1	Explain the various manufacturing process in smithy, foundry, fitting, assembling and disassembling and will be able to provide effective presentation.
21C117.2	Summarize the operations of various machine tools lathe , drilling
21C117.3	Develop models by using skills achieved from workshop sections like welding, carpentry, sheet metal and plumbing
21C117.4	Apply the skills of basic electrical engineering for domestic wiring practices
21C117.5	Apply the measuring instruments like energy meter and perform measurements in electrical circuits.
21C117.6	Exhibit ethical principles in engineering practices
21C117.7	Perform task as an individual and / or team member to manage the task in time
21C117.8	Express the Engineering activities with effective presentation and report
21C117.9	Interpret the findings with appropriate technological / research citation.

21C118 - GE 3271 CIRCUITS ANALYSIS LABORATORY

CO No.	Course Outcomes
21C118.1	Familiarize with DC and AC circuit analysis techniques
21C118.2	Analyze complicated circuits using different network theorems.
21C118.3	Acquire skills of using software for electrical circuit studies.
21C118.4	Determine the self and mutual inductance of coupled coils
21C118.5	Exhibit ethical principles in engineering practices
21C118.6	Perform task as an individual and / or team member to manage the task in

	time
21C118.7	Express the Engineering activities with effective presentation and report
21C118.8	Interpret the findings with appropriate technological / research citation.

21C201 - MA3355 RANDOM PROCESSES AND LINEAR ALGEBRA

CO No.	Course Outcomes
21CO201.1	Explain the basic knowledge of Probability and Distributions
21CO201.2	Explain the fundamental knowledge of one and two dimensional random variables
21CO201.3	Apply the concepts of Radom Processes in Engineering Problems
21CO201.4	Express Vector Space in different dimensions
21CO201.5	Apply inner product space in Orthogonalization process.

21C202 - CS3353 C PROGRAMMING AND DATA STRUCTURES

CO No.	Course Outcomes
21C202.1	Develop C program for any real world applications using arrays.
21C202.2	Apply Structures and Pointers to solve real life problems.
21C202.3	Make use of List, Queue, Stack for the implementation of real world problems
21C202.4	Develop a C program for efficient memory allocation using different Hashing techniques
21C202.5	Analyse various types of nonlinear data structure trees & suggest suitable type for solving real life problems
21C202.6	Apply different Searching & Sorting algorithms to solve real life problems.

21C203 - EC3354 SIGNALS AND SYSTEMS

CO No.	Course Outcomes
21C203.1	Classify the different types of continuous and discrete time signals and
21C203.2	Apply Fourier series, Laplace transform & Fourier transform in continuous time signal.
21C203.3	Characterize continuous LTI systems in the time domain and frequency domain

21C203.4	Apply Z transform and DTFT in discrete time signal .
21C203.5	Characterize discrete LTI systems in the time domain and frequency domain

21C204 - EC3353 ELECTRONIC DEVICES AND CIRCUITS

CO No.	Course Outcomes
21C04.1	Explain the structure and working operation of basic electronic devices.
21C04.2	Construct and analyse amplifiers.
21C04.3	Make use of the frequency response of BJT & MOSFET amplifiers
21C04.4	Build & analyze feedback amplifiers & oscillator principles
21C04.5	Construct & analyze power amplifiers and supply circuits

21C205 - EC3351 CONTROL SYSTEMS

CO No.	Course Outcomes
21C205.1	Identify the various control system components and Apply transfer function models to physical systems.
21C205.2	Determine the transient and steady state behaviour of systems subjected to standard test signals
21C205.3	Analysis the various frequency responses plots and design Compensators.
21C205.4	Apply the concepts of various system stability criteria
21C205.5	Express and solve system equations in state-variable form.

21C206 - EC3352 DIGITAL SYSTEM DESIGN

CO No.	Course Outcomes
21C206.1	Understand the Boolean Algebra digital logic gates.
21C206.2	Develop various combinational logic circuits using logic gates
21C206.3	Analyze and design synchronous sequential circuits using logic Gates.

21C206.4	Analyze and design Asynchronous sequential circuits using logic Gates.
21C206.5	Develop programmable logic devices using logic gates

21C207 - EC3361 ELECTRONIC DEVICES AND CIRCUITS LABORATORY

CO No.	Course Outcomes
21C207.1	Study the VI Characteristics of PN junction Diode and Zener Diode
21C207.2	Study the characteristics of MOSFET.
21C207.3	Determine the bandwidth of different BJT and FET amplifiers from frequency response
21C207.4	Determine the gain of differential and cascade amplifiers
21C207.5	Study the operation of power amplifiers
21C207.6	Exhibit ethical principles in engineering practices
21C207.7	Perform task as an individual and / or team member to manage the task in time
21C207.8	Express the Engineering activities with effective presentation and report
21C207.9	Interpret the findings with appropriate technological / research citation.

21C208 - CS3362 C PROGRAMMING AND DATA STRUCTURES LABORATORY

CO No.	Course Outcomes
21C208.1	Develop different operations of C to construct an application.
21C208.2	Design a function to implement the operations for linear and non-linear data structures.
21C208.3	Compare and use appropriate operation for a given problem.
21C208.4	Apply appropriate hash functions to avoid collision.
21C208.5	Implement Sorting and searching algorithm for a given application.
21C208.6	Exhibit ethical principles in engineering practices
21C208.7	Perform task as an individual and / or team member to manage the task in time
21C208.8	Express the Engineering activities with effective presentation and report
21C208.9	Interpret the findings with appropriate technological / research citation.

21C209 - GE3361- PROFESSIONAL DEVELOPMENT

CO No.	Course Outcomes
21C209.1	Use MS word to create quality documents by organizing their day to day technical and academic requirements
21C209.2	Use MS Excel to perform data operations and analytics record, retrieve data as per requirements and visualize data for ease of understanding
21C209.3	Use MS power point to create high quality academic presentation by including common tables, charts, graphs, interlinking other elements and using other media objects.

21C210 - EC3452 ELECTROMAGNETIC FIELDS

CO No.	Course Outcomes
21C210.1	Explain the concepts of Coordinate system and electromagnetic Laws
21C210.2	Describe the laws associated to static electric field and the properties of conductors and dielectric
21C210.3	Describe the laws associated to static Magnetic field and behavior of magnetic materials
21C210.4	Apply the Maxwell's equations to understand the electromagnetic wave propagation
21C210.5	Apply the mechanism of propagation of wave in different media

21C211 - EC3401 NETWORKS AND SECURITY

CO No.	Course Outcomes
21C211.1	Explain the Network Models, layers and functions.
21C211.2	Categorize and classify the routing protocols.
21C211.3	List the functions of the transport and application layer.
21C211.4	Evaluate and choose the network security mechanisms.
21C211.5	Discuss the hardware security attacks and counter measures.

21C212 - EC3451 LINEAR INTEGRATED CIRCUITS

CO No.	Course Outcomes
21C212.1	Explain the linear and non-linear operational amplifiers.
21C212.2	Explain the applications of operational amplifiers
21C212.3	Describe the analog multiplier & PLL circuits and its applications.
21C212.4	Summarize the operations of ADC and DAC using OP-AMP.
21C212.5	Summarize the concept of generation of waveforms using op-amps and operations of special function ICs.

21C213 - EC3492 DIGITAL SIGNAL PROCESSING

CO No.	Course Outcomes
21C213.1	Apply the concepts of DFT for analysis of Digital signals and systems.
21C213.2	Compute the realizations of various filters for Infinite impulse response
21C213.3	Compute the realizations of various filters for finite impulse response
21C213.4	Explain the Effects of Finite Precision Representation in Digital Filters
21C213.5	Explain the architecture for digital filters appropriately for communication systems

21C214 - EC3491 COMMUNICATION SYSTEMS

CO No.	Course Outcomes
21C214.1	Explain the principles of different analog modulation techniques
21C214.2	Apply the concepts of Random Process in Communication Systems
21C214.3	Construct the digital modulated waveforms by digital schemes.
21C214.4	Make use of sampling and quantization process for analog to digital conversion.
21C214.5	Illustrate the importance of demodulation techniques

21C215 - GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

CO No.	Course Outcomes
21C215.1	Illustrate the features of Ecosystem & biodiversity
21C215.2	Choose pollution control methods and waste management .
21C215.3	Understand the potential for energy generation from wind, solar, geothermal, and other clean or renewable sources.
21C215.4	Demonstrate the impact on economic viability, environmental protection and social equity.
21C215.5	Demonstrate an understanding of the role of sustainability in contemporary industry practices.

21C216 - EC3461 COMMUNICATION SYSTEMS LABORATORY

CO No.	Course Outcomes
21C216.1	Design AM, FM & Digital Modulators for specific applications.
21C216.2	Compute the sampling frequency for digital modulation.
21C216.3	Simulate & validate the various functional modules of Communication system.
21C216.4	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes.
21C216.5	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of Communication system.
21C216.6	Exhibit ethical principles in engineering practices
21C216.7	Perform task as an individual and / or team member to manage the task in time
21C216.8	Express the Engineering activities with effective presentation and report
21C216.9	Interpret the findings with appropriate technological / research citation.

21C217 - EC3462 LINEAR INTEGRATED CIRCUITS LABORATORY

CO No.	Course Outcomes
21C217.1	Analyse various types of feedback amplifiers
21C217.2	Design Oscillators, tuned amplifiers ,Wave shaping circuits and Multi vibrators using op- amp
21C217.3	Design and Simulate feedback amplifiers,Oscillators, tuned amplifiers ,Wave shaping circuits and Multi vibrators using SPICE tool

21C217.4	Design A-D converters using op-amp
21C217.5	Design Filter using op amp and perform an experiment on Frequency response.
21C217.6	Exhibit ethical principles in engineering practices
21C217.7	Perform task as an individual and / or team member to manage the task in time
21C217.8	Express the Engineering activities with effective presentation and report
21C217.9	Interpret the findings with appropriate technological / research citation.