

Noorul Islam Centre for Higher Education

(Deemed to be University u/s 3 of the UGC Act 1956)

Kumaracoil, Thuckalay, Kanyakumari District - 629 180

Accredited by NAAC with 'A' Grade

EC22 BE ELECTRONICS AND COMMUNICATION ENGINEERING



Student Performance and Learning Outcomes

EC22 BE ELECTRONICS AND COMMUNICATION ENGINEERING

Programme Outcome (PO)	
PO-1	To apply the knowledge of mathematics, science, and engineering fundamentals to solve problems in the domain of Electronics and Communication engineering.
PO-2	To identify, formulate and analyze complex problems in real world using principles of science and engineering.
PO-3	To design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health, safety, manufacturability and sustainability
PO-4	To conduct experiments, analyze and interpret experimental results and synthesize information to provide valid conclusion
PO-5	To apply techniques, skills, and modern engineering tools necessary for engineering practice.
PO-6	To develop and model complex electronic hardware and software systems for human needs.
PO-7	To comprehend the impact of engineering solutions in a global, economic, environmental, and societal context.
PO-8	To apply professional and ethical principles and function with responsibility.
PO-9	To identify areas of interest and to function an individual and as a member or leader in multidisciplinary teams.
PO-10	To articulate teamwork principles, work with a multi-disciplinary team, and appreciate the role of a leader.
PO-11	To communicate facts successfully with people in engineering domain and effectively design and prepare documents and reports.
PO-12	To apply knowledge of engineering and management principles in multidisciplinary environment and projects

PROGRAMME SPECIFIC OUTCOMES (PSO)

PSO-1	Apply the knowledge of Printed Circuit Board, Electronic Devices and Circuits in developing electronic systems for the real time applications.
PSO-2	Adapt to emerging trends in Information and Communication Technology by innovating new ideas to solve existing/novel problems.
PSO-3	Design, analyze and develop electronic products in the area of VLSI Design and Communication Systems.
PSO-4	Contribute as Entrepreneurs in building electronic products.

Sl.No	Subject Code	Subject Name
SEMESTER II		
1.	EG2102	Technical English – II
2.	MA2102	Engineering Mathematics – II
3.	BS2103	Environmental Science
4.	EC2201	Electron Devices
5.	EC2202	Electric Circuit Theory
6.	CS2206	Object Oriented Programming
7.	EC2271	Electron Devices and Electric Circuit Theory Lab
8.	CS2273	Object Oriented Programming Lab
SEMESTER IV		
9.	MA2208	Random Process and Queueing Theory
10.	EC2205	Analog Integrated Circuits
11.	EC2207	Transmission Lines and Waveguides
12.	EC2208	Signals & Systems
13.	EC2209	Electronic Circuits – II
14.	EC2210	Communication Theory
15.	EC2274	Analog Communication Lab
16.	EC2275	Electronic Circuits-II Lab
17.	EC2277	Integrated Circuits Lab
SEMESTER VI		
18.	IT1212	Cyber Security
19.	EC1214	Microprocessor and Microcontroller
20.	EC1215	Antenna and Wave Propagation
21.	EC1216	Computer Communication
22.	EC12B8	Mobile Communication
23.	EC12C8	Electronic Measurements and Instrumentation
24.	EC1278	Microprocessor and Microcontroller Lab
25.	EC1277	Electronic Circuits and Simulation Lab
SEMESTER VIII		
26.	EC12C1	Satellite Communication
27.	EC12C2	Remote Sensing
28.	EC12B6	Medical Electronics
29.	EC1220	Nano Electronics
30.	EC12P5	Project Work

EG2102-Technical English - II	
CO1	The Students will be able to improve their vocabulary and use articles and prepositions effectively in sentences.
CO2	The students will be able to understand grammatical items like phrases and verbs, derivatives, relative pronouns etc. and thereby enhance their linguistic competence.
CO3	The students will be able to acquire the essentials of writing skills relating to resume writing, E-mail writing and also the essential components of essay writing.
CO4	The students will be able to learn the basics of letter writing and the formalities involved in writing formal and business letters.
CO5	The students will be able to learn English Phonemes such as vowels, Diphthongs, consonants, Stress and Intonation.

MA 2102- Engineering Mathematics - II	
CO1	Understand the linear differential equation with constant and variable coefficients.To solve the Cauchy's and Legendre equations and solve the differential equations by variation of parameters.
CO2	Know about functions of a complex variable, analytic functions, Cauchy'sRiemman equations. To prove the properties of analytic functions. To find the analytic function and bilinear transformation.
CO3	Study about Cauchy's integral formula and Cauchy's integral theorem, Laurent's expansion. Know about singular point, Cauchy's integral theorem. To evaluate the integral by contour integration.
CO4	Know about gradient, divergence,curl , directional derivatives, irrotational and solenoidal vector field. To verify the vector integration by Green's theorem, Gauss divergence theorem and Stoke's theorem.
CO5	Obtain the Laplace transform of elementary functions. Transform of dervatives and integrals and periodic functions.To find the inverse Laplace transform using convolution theorem and solve the differential equations.

BS2103- Environmental Science	
CO1	Remember and understand the environment and its resources
CO2	Understand the ecosystem and the various techniques to protect ecosystem
CO3	Analyze the causes of environmental pollution
CO4	Synthesize the role of engineer to protect the environment
CO5	Understand the human rights and the value education

EC2201-Electron Devices	
CO1	Derive the drift and diffusion current by understanding the fundamentals of semiconductors.
CO2	Learn about the characteristics and applications of semiconductor diodes.
CO3	Evaluate the various parameters of BJT, JFET and MOSFET by understanding their characteristics.
CO4	Familiar with the principle of operation and characteristics of special semiconductor devices, Tunnel diode, Gunn diode etc.
CO5	Learn about the principle of operation and characteristics of Thyristors and Display devices.

EC2202- Electric Circuit Theory	
CO1	Analyze the behavior of basic circuit elements and to apply the concept of mesh and node analysis in circuit theory
CO2	Apply various network theorems to determine the circuit response
CO3	Understand the concept of resonance and coupled circuits
CO4	Analyze the transient response of different electrical circuits with and without initial conditions using Laplace Transforms
CO5	Perform calculations involving balanced and unbalanced three phase circuits

CS2206- Object Oriented Programming	
CO1	Understand the difference between object oriented programming and procedural oriented language and the features of C++ supporting object oriented programming
CO2	Understand advanced features of C++ specifically stream I/O, templates and operator overloading.
CO3	Use java programming language at a basic level and construct software application through java coding.
CO4	Apply good programming style and understand the impact of style on developing and maintaining programs.
CO5	Work independently or collaborate within a team to develop software applications and services using java code.

EC2271- Electron Devices and Electric Circuit Theory Lab	
CO1	Learn the working of electronic devices
CO2	Measure the electrical parameters with their corresponding measuring devices
CO3	Verify the characteristics of devices as in theory
CO4	Analyze the network theorems with real components
CO5	Design and analyze few circuits with electronic devices

EC2273- Object Oriented Programming Lab	
CO1	Understand the relative merits of C++ as an object oriented programming language.
CO2	Apply the concepts of class, method, constructor, abstraction, encapsulation, overloading etc.
CO3	Analyze the usefulness of inheritance paradigm and template classes.
CO4	Apply good programming style and understand the impact of style on developing and maintaining programs.
CO5	Work independently or collaborate within a team to develop software applications and services using java code.

MA2208 - Random Process and Queueing Theory	
CO1	Random variable needs the analysis of random phenomena. Apply the concept of moment, moment generating function to discrete and continuous distribution.
CO2	Extended one dimensional random variables to two dimensional random variables and analyze. Understand the concept of correlation and regression.
CO3	Estimate the function of time when the probability measure is associated to random processes.
CO4	Correlation functions are used to understand the properties of random processes. Analyze Fourier transform applied to random signal in frequency domain.
CO5	To understand the basic characteristic features of a queuing system and acquire skills in analyzing queuing models.

EC2205- Analog Integrated Circuits	
CO1	Infer the DC and AC characteristics of OPAMP and its effect on output and their compensation techniques
CO2	Analyze and design of basic OPAMP circuits, particularly various linear and non-linear circuits
CO3	Learn about the various techniques used to develop AD and DA converters
CO4	Analysis of multipliers, PLL and their applications
CO5	Working of multivibrators using special function, 555 and their applications

EC2207- Transmission Lines and Waveguides	
CO1	Understanding the various types of transmission lines and their characteristics
CO2	Understanding the design of high frequency transmission lines and quantifying its parameters
CO3	Analyzing the transmission lines and their parameters using smith chart
CO4	Understanding the propagation characteristics of EM waves between the parallel planes
CO5	Recognizing the characteristics of EM wave propagation in wave guides and cavity resonators.

EC2208 - Signals & Systems	
CO1	Understand about various types of signals and systems, classify, analyze and perform various operations on them.
CO2	Analyze the spectral characteristics of continuous-time periodic and aperiodic signals using Fourier and Laplace transform.
CO3	Classify systems based on their properties and determine the response of LTI system using convolution.
CO4	Understand the process of sampling and apply Z-transform for analysis of discrete- time signals.
CO5	Evaluate the frequency response and to analyze the system properties of a LTI-DT system.

EC2209 - Electronic Circuits – II	
CO1	Design and Analyze feedback amplifiers and know the Characteristics
CO2	Design and compare different oscillators
CO3	Analyse the parameters of different tuned amplifiers
CO4	Know the concept and design of multivibrators triggering circuit and wave shaping
CO5	Classify and relate the blocking oscillators and time base generators

EC2210 - Communication Theory	
CO1	Learn about the basic concepts, generation and demodulation of AM wave and FDM technique
CO2	Understand the basic concepts, generation and demodulation of FM wave and PM wave.
CO3	Construct different pulse modulation system like PAM,PDM and PPM
CO4	Analyze AM and FM systems to find out the Figure of Merit.
CO5	Evaluate the entropy and the coding efficiency of different source coding algorithm

EC2274 - Analog Communication Lab	
CO1	Design of a Amplitude modulator and demodulator circuit
CO2	Design of a Frequency modulator and demodulator circuit
CO3	Studying of Matlab
CO4	Simulation of FM modulation and demodulation using Matlab
CO5	Design of preemphasis and De-emphasis circuit

EC2275 - Electronic Circuits-II Lab	
CO1	Design and analyse the feedback amplifiers
CO2	Design and analyse various oscillators and multivibrators , RC integrators
CO3	Design and simulate the oscillators double and stagger tuned Amplifiers
CO4	Simulate multivibrators using MOSFET
CO5	Simulate base timing and blocking oscillators

EC2277- Integrated Circuits Lab	
CO1	Infer the DC and AC characteristics of operational amplifiers and its effects on output and their compensation techniques.
CO2	Elucidate and design the linear and non-linear applications of op-amp and special application ICs.
CO3	Design and compare the working of multivibrators using special application IC555 and general purpose op-amp.
CO4	Design filters for required bandwidth using op-amp.
CO5	Illustrate and design the function of application specific ICs such as voltage regulators, PLL and its application in communication.

IT1212 - Cyber Security	
CO1	Ability to understand different types of networks and its design
CO2	Get an exposure to fundamental importance of security
CO3	Analyze different types of threats and security issues
CO4	Investigate the different protocols and principles towards security
CO5	Learn about investigation and laws against cyber crimes

EC1214- Microprocessor and Microcontroller	
CO1	Solve basic binary math operations using the microprocessor and understand microprocessor's internal architecture and its operation.
CO2	Write Interrupt Service Routine to handle interrupts in 8086 microprocessor.
CO3	Write programs to run on 8086 microprocessor based systems
CO4	Understand the functionalities of microcontroller
CO5	Design and develop microcontroller based system for real time application

EC1215- Antenna and Wave Propagation	
CO1	Understanding fundamental parameters of antenna
CO2	Analyzing the concept of electromagnetic wave radiation
CO3	Design of antenna arrays and plot its radiation pattern
CO4	Design of various antenna for different applications
CO5	Studying the different wave propagation modes

EC1216- Computer Communication	
CO1	Independently understand basic computer network terminology.
CO2	Understand and explain data communication system and its components.
CO3	Identify different types of topologies and protocols.
CO4	Enumerate and explain the functions of transport layer in ISO/OSI model.
CO5	Identify different types of network devices and their functions within a network.

EC12B8 - Mobile Communication	
CO1	Remember the cellular concepts from Basics. Understand the system design fundamentals.
CO2	Understanding the mobile radio propagation and models.
CO3	Describe the various modulation techniques and various equalization methods.
CO4	Apply the various coding and multiple access techniques in mobile communication.
CO5	Understanding the various wireless system and standards.

EC12C8 - Electronic Measurements and Instrumentation	
CO1	Measure various electrical parameters with accuracy precision
CO2	Know the concepts of transducers
CO3	Design and use AC and DC bridges for relevant parameter measurement
CO4	Understand and Analyze the working of digital Instruments, data loggers and counters
CO5	Understand the various types of measuring Instruments

EC1278 - Microprocessor and Microcontroller Lab	
CO1	Apply knowledge through programming efficiency
CO2	Apply ideas using addressing modes and data transfer instructions of microprocessor
CO3	Understand the difference between microprocessor and microcontroller
CO4	Design small systems using 8086 microprocessor
CO5	Design and develop microcontroller and microprocessor based system for real time application

EC1277 - Electronics and simulation Lab	
CO1	Design of feedback amplifiers and obtain its responses.
CO2	Design of oscillators and compare their performances.
CO3	Design and compare the working of different multivibrators.
CO4	Simulate Ethernet LAN protocol using NET SIM.
CO5	Simulate time and frequency responses using MAT Lab.

EC12C1- Satellite Communication	
CO1	Understand orbital mechanics and launching methodologies
CO2	Understand working of a satellite communication system and its subsystems
CO3	Design antennas with desired uplink and downlink frequencies
CO4	Analyze the multiple access techniques like TDMA, CDMA and FDMA.
CO5	Demonstrate the impacts of GPS, Navigation, NGSO constellation design for tracking and launching

EC12C2 – Remote Sensing	
CO1	Understand the electromagnetic remote sensing platforms used for data acquiring process.
CO2	Understand the different platforms, sensors used in remote sensing.
CO3	Analyze the various data interpretation and image processing techniques.
CO4	Select and process the appropriate satellite images for specific applications.
CO5	Integrate and satellite data with GIS for solving societal issues.

EC12B6 - Medical Electronics

CO1	Learn about the biological parameters related to electronics and electrical parameters
CO2	Learn about the various measuring and recording systems.
CO3	Familiarize with the Bio Chemical and electrical parameter measurement
CO4	Gain the knowledge about various assist devices for health care
CO5	Gain knowledge about recent medical instrumentation devices

EC1220 - Nano Electronics

CO1	Learn the fundamentals of nano materials
CO2	Learn the process of nano material synthesis
CO3	Learn the fabrication of nano material devices
CO4	Analyze the structures of carbon nano materials and tubes
CO5	Learn the application of nano materials and devices

EC12P5 - Project Work

CO1	Demonstrate a sound technical knowledge of their selected project topic.
CO2	Undertake problem identification, formulation and solution.
CO3	Design engineering solutions to complex problems utilising a systems approach.
CO4	Conduct an engineering project
CO5	Demonstrate the knowledge, skills and attitudes of a professional engineer.