REGENT EDUCATION AND RESEARCH FOUNDATION GROUP OF INSTITUTIONS

Department of Electronics & Communication Engineering (2021-2022)

Program code	Program Name	Course code	Course Name	Course Outcome	
ECE-UG	Electronics and Communication Engineering (B.Tech)	BSCH101	Chemistry-I(Gr-B)	BSCH101.1	Analyse microscopic chemistry in terms of atomic and molecular orbitals and intermolecular forces.
				BSCH101.2	Distinguish the ranges of the electromagnetic spectrum used for exciting different molecular energy levels in various spectroscopic techniques
				BSCH101.3	Rationalise bulk properties and processes using thermodynamic considerations.
				BSCH101.4	Rationalise different periodic properties such as ionization potential, electronegativity, oxidation states, electronegativity etc among the elements.
				BSCH101.5	To find out the Structural representation of Molecules in three dimensions and major chemical reactions involved to synthesize molecules as well as common drugs.
ECE-UG	Electronics and Communication Engineering	BSM102	Mathematics –IB	BSM102.1	Apply the concept and techniques of differential and integral calculus to determine curvature and evaluation of different types of improper integrals.
				BSM102.2	Understand the domain of applications of mean value theorems to engineering problems
				BSM102.3	Learn the tools of power series and Fourier series to analyse engineering problems and apply the concept of convergence of infinite series in many approximation techniques in engineering disciplines
				BSM102.4	Apply the knowledge for addressing the real life problems which comprises of several variables or attributes and identify extremum points of different surfaces of higher dimensions
				BSM102.5	Apply the method of Gauss Jordan elimination to find the solution of systems of simultaneous linear equations.
ECE-UG	Electronics and Communication Engineering (B.Tech)	ESEE101	Basic Electrical Engineering	ES-EE101.1	To introduce the components of low voltage electrical installations
				ES-EE101.2	To understand and analyze basic electric and magnetic circuits.
				ES-EE101.3	To study the working principles of electrical machines and power converters
ECE-UG	Electronics and Communication	BSCH191	Laboratory	BSCH191.1	To understand the basic concepts of chemistry and

					use them for technological operation where appropriate.
				BSCH191.2	To exercise basic laboratory data analysis techniques, including graphical representation, error analysis etc.
				BSCH191.3	To correlate the theory with experimental method, result and conclusion
				BSCH191.4	Students will learn how to effectively carry out a work done either in single or as a team member in the laboratory.
ECE-UG	Electronics and Communication Engineering (B.Tech)	ESEE191	Basic Electrical Engineering Laboratory	ES-EE-191.1	Identify appropriate equipment and instruments for the experiment
				ES-EE-191.2	Test the instrument for application to the experiment.
				ES-EE-191.3	Construct circuits with appropriate instruments and safety precautions
				ES-EE-191.4	Validate different characteristics of DC machine , methods of speed control of DC motor ,Synchronous machine and Induction motor
				ES-EE-191.5	Identify basic operation of power electronic
				ES-EE-191.6	Validate basic operation of power system.
ECE-UG	Electronics and Communication Engineering (B.Tech)	BSPH201	Physics-I (Gr-B)	BSPH201.1	Recognise different concepts of mechanics and extend these concepts to identify real-world problems
				BSPH201.2	Illustrate optical phenomena like interference, diffraction, polarisation, and lasing action with physical and compact mathematical models.
				BSPH201.3	Classify different magnetic and dielectric materials and explain their properties.
				BSPH201.4	Demonstrate various quantum mechanical phenomena and solve numerical problems associated with them.
				BSPH201.5	Illustrate different types of statistical mechanics and use them to predict the behaviour of real-world particles
				BSPH201.6	Analyse different physical and numerical problems based on the knowledge of physics
ECE-UG	Electronics and Communication Engineering (B.Tech)	BSM202	Mathematics –IIB	BSM202.1	Learn the methods for evaluating multiple integrals and their applications to different physical problems.
				BSM202.2	Understand different techniques to solve first and second order ordinary differential equations with its formulation to address the modelling of systems and problems of engineering sciences

				BSM202.3	Find the complete solution of a differential equation with constant coefficients by variation of parameters and student will have a working knowledge of basic application problems described by second order linear differential equations with constant coefficients..
				BSM202.4	Learn different tools of differentiation and integration of functions of a complex variable that are used with various other techniques for solving engineering problems.
				BSM202.5	evaluate a contour integral using parametrization, fundamental theorem of calculus and Cauchy's integral formula and compute the residue of a function and use the residue theory to evaluate a contour integral or an integral over the real line;
ECE-UG	Electronics and Communication Engineering (B.Tech)	ESCS201	Programming for Problem Solving	ESCS 201.1	To formulate simple algorithms for arithmetic and logical problems.
				ESCS 201.2	To translate the algorithms to programs (in C language).
				ESCS 201.3	To test and execute the programs and correct syntax and logical errors.
				ESCS 201.4	To implement conditional branching, iteration and recursion.
				ESCS 201.5	To decompose a problem into functions and synthesize a complete program using divide and conquer approach.
				ESCS 201.6	To use arrays, pointers and structures to formulate algorithms and programs.
				ESCS 201.7	To apply programming to solve matrix addition and multiplication problems and searching and sorting problems.
				ESCS 201.8	To apply programming to solve simple numerical method problems, namely root finding of function, differentiation of function and simple integration.
ECE-UG	Electronics and Communication Engineering (B.Tech)	HMHU201	English	HM HU-201.1	Develop confidence in the students so that they can acquire technical skills.
				HM HU-201.2	Build to implement the you – view point in business writing.
				HM HU-201.3	Demonstrate the role of communication at work place.
				HM HU-201.4	Build strong interpersonal skills, understand behaviour of team members and practice empathy towards others.
				HM HU-201.5	Explain four skills of English Language, Listening. Reading, speaking and writing.
EC E-U &	mu nic ati	BS PH 29	La bor ato	BSPH291.1	Examinevarioussemiconductor and

					dielectricproperties(Hallcoefficient,Bandgap, Dielectric constant)andrelatethe sametothetheoreticallawstheyhavelearnt.
				BSPH291.2	Determine variousquantum mechanical constants (Stefan's-Boltzmann constant, Planck's constant, Lande-g factor, Rydberg constant)
				BSPH291.3	Apply the concept of electrical properties of matter to determine different characteristics of materials and electrical devices.
				BSPH291.4	Examinethecharacteristicsof electronic motion under the influence of thermal energy and magnetic field forthermometriccalibrationandcalculation ofspecific charge.
				BSPH291.5	Computedifferentfundamentalelasticconstants&generalpropertiesof matter.
				BSPH291.6	Applythe conceptof refraction, interferenceanddiffractiontocalculate the wavelengthoflightsources andoptical properties of matter.
ECE-UG	Electronics and Communication Engineering (B.Tech)	ESCS291	Programming for Problem Solving	ESCS291.1	To formulate simple algorithms for arithmetic and logical problems.
				ESCS291.2	To translate the algorithms to programs (in C language).
				ESCS291.3	To be able to correct syntax errors as reported by the compilers
				ESCS291.4	To be able to identify and correct logical errors encountered at run time
				ESCS291.5	To be able to write iterative as well as recursive programs
				ESCS291.6	To be able to represent data in arrays, strings and structures and manipulate them through a program
				ESCS291.7	To be able to declare pointers of different types and use them in defining self-referential structures.
				ESCS291.8	To be able to create, read and write to and from simple text files.
ECE-UG	Electronics and Communication Engineering (B.Tech)	HMHU291	Language Laboratory	HM HU-291.1	Develop 'Listening Skill' and its sub skills through Language Lab Audio device;
				HM HU-291.2	Build 'Speaking Skill' and its sub skills
				HM HU-291.3	
				HM HU-291.4	Explain Linguistic/Paralinguistic features (Pronunciation/Phonetics/ Voice modulation/ Stress/ Intonation/ Pitch &Accent) of connected speech

				HM HU-291.5	Improve ‘Conversation Skill’ using Language Lab Audio –Visual input; Conversational Practice Sessions (Face to Face / via Telephone, Mobile phone &Role Play Mode)
				HM HU-291.6	Organize ‘Group Discussion’ through audio – Visual input and explain the key strategies for success.
				HM HU-291.7	Develop ‘Reading Skills’ and its sub skills using Visual / Graphics/ Diagrams /Chart Display/Technical/Non-Technical Passages Learning Global / Contextual / Inferential Comprehension;
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC301	Electronic Devices	EC301.1	Distinguishthe conduction techniques in semiconductor materials.
				EC301.2	Analyse characteristics of Semi-conductor diodes and solve problems.
				EC301.3	Analyse characteristics of bipolar Transistors and solve problems.
				EC301.4	Analyse characteristics of MOS Transistors and solve problems.
				EC301.5	Classify and Analyse different Opto-electronic devices.
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC302	Digital System Design	EC302.1	Design and analyze combinational logic circuits
				EC302.2	Design &analyze modular combinational circuits with MUX/DEMUX, Decoder, Encoder
				EC302.3	Design &analyze synchronous sequential logic circuits
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC303	Signals & Systems	EC303.1	Describe different kinds of signals and systems and their operations
				EC303.2	Interpret the concept of sampling theorem and its applications
				EC303.3	Demonstrate different kind of transformation of the signals
				EC303.4	Identify the properties of transformation of the signals
				EC303.5	Recognise and formulate the problems based on the transformation of the signals
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC304	Network Theory	EC304.1	Understand basics electrical circuits with nodal and mesh analysis.
				EC304.2	Appreciate electrical network theorems.
				EC304.3	Apply Laplace Transform for steady state and transient analysis.
				EC305.4	Determine different network functions.
				EC306.5	Appreciate the frequency domain techniques.
EC E- U &	mu nic ati	ES CS 30	ure & Al	ESCS301.1	Differentiate how the choices of data structure &

					algorithm methods impact the performance of program.
				ESCS301.2	Solve problems based upon different data structure & also write programs.
				ESCS301.3	Identify appropriate data structure & algorithmic methods in solving problem.
				ESCS301.4	Discuss the computational efficiency of the principal algorithms for sorting, searching, and hashing
				ESCS301.5	Compare and contrast the benefits of dynamic and static data structures implementations.
ECE-UG	Electronics and Communication Engineering (B.Tech)	BSM301	Probability & Statistics (BS)	BSM301.1	The ideas of probability and random variables and various discrete and continuous probability distributions and their properties.
				BSM301.2	Find the means and variances of the discrete random variables X and Y using their joint probability mass function.
				BSM301.3	To learn about the Bivariate distribution.
				BSM301.4	The basic ideas of statistics including measures of central tendency, correlation and regression
				BSM301.5	Analyze statistical data graphically using frequency distributions and cummulative frequency distributions.
				BSM301.6	The statistical methods of studying data samples.
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC391	Electronic Devices Lab	EC391.1	An ability to verify the working of different diodes, transistors, CRO probes andmeasuring instruments. Identifying the procedure of doing the experiment.
				EC391.2	Ability to understand the characteristics of BJT and FET and how to Determine different parameters for designing purposes.
				EC391.3	Ability to understand properties of photoelectric devices
				EC391.4	Ability to measure and record the experimental data, analyse the results, and prepare formal laboratory report.
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC392	Digital System Design Lab	EC392.1	Ability to learn the basics of gates.
				EC392.2	Ability to construct basic combinational circuits and verify their functionalities
				EC392.3	Apply the design procedures to design basic sequential circuits
				EC393.4	Ability to learn about counters and shift Register
				EC393.5	Ability to understand the basic digital circuits and to verify their operation
EC E- U &	mu nic ati	ES CS 39	uct ure La	ESCS 391.1	Student will able to Implement array(1D AND

					2D), Stacks and Queues operations.
				ESCS 391.2	Student will able to Implement Single and double linked lists.
				ESCS 391.3	Student will able to Implement different Sorting and Search Algorithms.
				ESCS 391.4	Student will able to Implement of Recursive and Non-recursive traversal of Trees, Hash tables
				ESCS 391.5	Student will able to Implementation different tree implementation.
ECE-UG	Electronics and Communication Engineering (B.Tech)	MC381	Environmental Science	MC- 381.1	Be able to understand the natural environment and its relationships with human activities.
				MC- 381.2	Be able to apply the fundamental knowledge of science and engineering to assess environmental and health risk
				MC- 381.3	Be able to understand environmental laws and regulations to develop guidelines and procedures for health and safety issues
				MC- 381.4	Be able to solve scientific problem-solving to air, water, noise and land pollution.
				MC- 381.5	Students will learn how to effectively carry out a work done either in single or as a team member
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC401	Analog Communication	EC401.1	Recollect the nature of continuous wave and signals
				EC401.2	Understand modulation and different generation and detection of amplitude modulation
				EC401.3	Compute and assess angle modulation
				EC401.4	Analysis multiplexing technique and point out random signals
				EC401.5	Synthesis and integrate analog communication system and develop a system design
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC402	Analog Electrical Circuits	EC402.1	Understand the characteristics of diodes and transistors.
				EC402.2	Design and analyze various rectifier and amplifier circuits.
				EC402.3	Design sinusoidal and non- sinusoidal oscillator circuits.
				EC402.4	Understand the functioning of OP-AMP and design OP-AMP based circuits
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC403	Microprocessors & Microcontrollers	EC403.1	Able to correlate the architecture, instructions, timing diagrams, addressingmodes, memory interfacing, interrupts, data communication of 8085
				EC403.2	Able to interpret the 8086 microprocessor-Architecture, Pin details, memorysegmentation, addressing modes, basic instructions, interrupts

				EC403.3	Recognize 8051 micro controller hardware, input/output pins, ports, externalmemory, counters and timers, instruction set, addressing modes, serial data i/o,interrupts
				EC403.4	Apply instructions for assembly language programs of 8085 and 8051
				EC403.5	Design peripheral interfacing model using IC 8255 with 8085
ECE-UG	Electronics and Communication Engineering (B.Tech)	ESCS401	Design & Analysis of Algorithm (ES)	ESCS401.1	For a given algorithms analyze worst-case running times of algorithms based on asymptotic analysis and justify the correctness of algorithms.
				ESCS401.2	Describe the greedy paradigm and explain when an algorithmic design situation calls for it. For a given problem develop the greedy algorithms.
				ESCS401.3	Describe the divide-and-conquer paradigm and explain when an algorithmic design situation calls for it. Synthesize divide-and-conquer algorithms. Derive and solve recurrence relation.
				ESCS401.4	Describe the dynamic-programming paradigm and explain when an algorithmic design situation calls for it. For a given problems of dynamic-programming and approximation.
				ESCS401.5	Develop the dynamic programming algorithms, and analyze it to determine its computational complexity.
				ESCS401.6	For a given model engineering problem model it using graph and write the corresponding algorithm to solve the problems.
				ESCS401.7	Explain the ways to analyze randomized algorithms (expected running time, probability of error).
				ESCS401.8	Explain what an approximation algorithm is. Compute the approximation factor of an approximation algorithm (PTAS and FPTAS).
ECE-UG	Electronics and Communication Engineering (B.Tech)	BSB401	Biology for Engineers	BS-B401.1	Classify all the categories of enzymes and learn the differences in the enzymatic actions.
				BS-B401.2	Identify DNA as a genetic material and learn the composition of DNA.
				BS-B401.3	Convey that all the life forms are made up of same basic building blocks.
				BS-B401.4	Identify and classify the living world including microbes.
				BS-B401.5	Highlight the concepts of dominance and recessiveness in the field of genetics.
ECE-UG	Communication	EC492	g Electronic	EC492.1	Design and test rectifiers, clipping circuits, clamping circuits and

					voltage regulators.
				EC492.2	Compute the parameters from the characteristics of JFET and MOSFET devices.
				EC492.3	Design, test and evaluate BJT amplifiers in CE configuration.
				EC492.4	Design and test JFET/MOSFET amplifiers.
				EC492.5	Design and test a power amplifier.
				EC493.6	Design and test various types of oscillators
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC493	Microprocessors & Microcontrollers Lab	EC493.1	CO1: Familiarization with 8085 & 8051simulator on PC.
				EC493.2	CO2: Familiarization with 8085 Kit
				EC493.3	CO3: Apply assembly language to solve problems.
				EC493.4	CO4: Interfacing 8255 with 8085
ECE-UG	Electronics and Communication Engineering (B.Tech)	BSM(CS)491	Numerical Methods Lab	BSM(CS)491.1	Demonstrate understanding of common numerical methods and how they are used to obtain approximate solution to otherwise intractable mathematical problem.
				BSM(CS)491.2	Apply numerical methods to obtain appropriate solutions to mathematical problems.
				BSM(CS)491.3	Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and non-linear equations, and the solution of differential equations.
ECE-UG	Electronics and Communication Engineering (B.Tech)	HSHU481	Soft Skill Development Lab	HS HU-481.1	Develop conversational skills
				HS HU-481.2	Organize intensive Practice Sessions
				HS HU-481.3	Explain organisational and Academic Writing
				HS HU-481.4	Plan and design of practice sessions of Personal Interview
				HS HU-481.5	Discuss on Presentation Skill
				HS HU-481.6	Define T.O.E.F.L. and IELTS with proper guidance and practice sessions
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC501	Electromagnetic Waves	EC501.1	Understand characteristics and wave propagation on high frequency transmission lines
				EC501.2	Carryout impedance transformation on TL
				EC501.3	Use sections of transmission line sections for realizing circuit elements
				EC501.4	Characterize uniform plane wave
				EC501.5	Calculate reflection and transmission of waves at

					media interface
				EC501.6	Analyze wave propagation on metallic waveguides in modal form
				EC501.7	Understand principle of radiation and radiation characteristics of an antenna
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC503	Digital Communication & Stochastic Process	EC503.1	Understand the concept of Stochastic Process in Communication System
				EC503.2	Represent various signals in different mathematical forms
				EC503.3	Analyze baseband transmission mode of digital data
				EC503.4	Analyze different career modulation techniques considering noise aspects
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC504	Digital Signal Processing	EC504.1	Remember the basic idea of signals and system
				EC504.2	Understand the fundamental concepts of DSP theory such as sampling theory, discrete frequency and Z-transform
				EC504.3	Analyze the response of an LTI system to different signals
				EC504.4	Develop an understanding of DTFT, DFT, and FFT
				EC504.5	Understand signal flow graph and block diagram representations of different equations that realize digital filters
ECE-UG	Electronics and Communication Engineering (B.Tech)	PE-EC505C	Power Electronics	PE-EC505C.1	Build and test circuits using power devices such as SCR
				PE-EC505C.2	Analyze and design controlled rectifier, DC to DC converters, DC to AC inverter
				PE-EC505C.2	Learn how to analyze these inverters and some basic applications.
				PE-EC505C.2	Design SMPS.
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC591	Electromagnetic Wave Lab	EC591.1	Understand the radiated EM wave and its pattern.
				EC591.2	Realize the radiated power of the antenna
				EC591.3	Understand the practical use of Smith chart. Observation of the frequency spectrum of the EM wave
				EC591.4	Behaviour of the Transmission line.
ECE-UG	and Communication	EC592	Digital Communication Lab	EC592.1	Evaluate the performance of PCM, PAM and PWM schemes.
				EC592.2	Implement different digital modulation schemes like FSK, PSK.

				EC592.3	Analyze source/channel encoding & decoding methods.
				EC592.4	To formulate basic concepts of pulse shaping in digital communication.
				EC592.5	To identify different line coding techniques and demonstrate the concepts
ECE-UG	Electronics and Communication Engineering (B.Tech)	MC-HU581	Effective Technical Communication	MC HU-501.1	Develop conversational skills
				MC HU-501.2	Organize intensive Practice Sessions
				MC HU-501.3	Make an effective use of group working skills through Group Discussion
				MC HU-501.4	Explain organisational and Academic Writing
				MC HU-501.5	Plan and design of practice sessions of Personal Interview
				MC HU 501.6	Discuss on Presentation Skill
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC601	Control System & Instrumentation	EC601.1	Understand basic linear open loop and closed loop systems and find out the overall transfer function of a complicated system using different methods
				EC601.2	Analyze stability of a system using different tests
				EC601.3	Analyze time response of first and second order system and Design various controllers to improve system transient and steady state response
				EC601.4	Apply root locus method and determine the location of the closed-loop poles
				EC601.5	Reconstruct the transfer function model of different control systems through state space model
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC602	Computer Network	EC602.1	Understand the computer communication process.
				EC602.2	Analyze research related information
				EC602.3	Follow research ethics 4. Understand that today's world is controlled by Computer, Information Technology, but tomorrow world will be ruled by ideas, concept, and creativity.
				EC602.4	Understanding that when IPR would take such important place in growth of individuals & nation, it is needless to emphasis the need of information about Intellectual Property Right to be promoted among students in general & engineering in particular.
				EC602.5	Understand that IPR protection provides an incentive to inventors for further research work and investment in R & D, which leads to creation

					of new and better products, and in turn brings about, economic growth and social benefits.
ECE-UG	Electronics and Communication Engineering (B.Tech)	PE-EC603C	CMOS VLSI Design	PE-EC603C.1	Identify the various IC fabrication methods.
				PE-EC603C.2	Express the Layout of simple MOS circuit.
				PE-EC603C.3	Understand the building block of MOSFET
				PE-EC603C.4	Differentiate various FPGA architectures.
				PE-EC603C.5	Design an application using CMOS circuit.
ECE-UG	Electronics and Communication Engineering (B.Tech)	OE-EC604A	Electronic Measurements and Measuring Instruments	OE-EC604A.1	Describe the fundamental concepts and principles of instrumentation
				OE-EC604A.2	Explain the operation of various instruments required in measurements
				OE-EC604A.3	Apply the measurement techniques for different types of tests
				OE-EC604A.4	To select specific instruments for specific measurement function.
				OE-EC604A.5	Understand principle of operation and working of different electronic instruments Students will understand functioning, specification and application of signal analyzing instruments.
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC692	Computer Network Lab.	EC692.1	NIC Installation & Configuration (Windows/Linux)
				EC692.2	Understanding IP address, subnet etc Familiarization with Networking cables (CAT5, UTP), Connectors (RJ45, T-connector), Hubs, Switches
				EC692.3	TCP/UDP Socket Programming, Simple, TCP based, UDP based, Multicast & Broadcast Sockets, Implementation of a Prototype Multithreaded Server
				EC692.4	Server Setup/Configuration FTP, TelNet, NFS, DNS, Firewall
ECE-UG	Electronics and Communication Engineering (B.Tech)	EC681	Mini Project/ Electronic Design Workshop	EC 681.1	Conceive a problem statement either from rigorous literature survey or from the requirements raised from need analysis.
				EC 681.2	Design, implement and test the prototype/algorithm in order to solve the conceived problem.
				EC 681.3	Write comprehensive report on mini project work.
ECE-UG	Communication Engineering	PE-EC701A	Theory	PE-EC701A.1	Understand various microwave system components their properties.
				PE-	Appreciate that during analysis/ synthesis of

				EC701A.2	microwave systems, the different mathematical treatment is required compared to general circuit analysis.	
				PE-EC701A.3		Design microwave systems for different practical application.
ECE-UG	Electronics and Communication Engineering (B.Tech)	PE-EC702A	Adaptive Signal Processing	PE-EC702A.1	Understand the non-linear control and the need and significance of changing the control parameters w.r.t. real-time situation.	
				PE-EC702A.2	Mathematically represent the 'adaptability requirement'.	
				PE-EC702A.3	Understand the mathematical treatment for the modelling and design of the signal processing systems.	
ECE-UG	Electronics and Communication Engineering (B.Tech)	PE-EC703A	Embedded System	PE-EC703A.1	CO1: Acquire basic knowledgeof microcontrollers and other hardware components used in embedded systems.	
				PE-EC703A.2	CO2: Acquire basic knowledge about the fundamentals of Computer architecture	
				PE-EC703A.2	CO3: Ability to understand the RTOS and its functions	
				PE-EC703A.3	CO4: Illustrate and apply different IO protocols.	
				PE-EC703A.3	CO5: Ability to understand the requirement of software and hardware in an embedded system	
ECE-UG	Electronics and Communication Engineering (B.Tech)	OE-EC704A	Web Technology	OE-EC704A.1	Design good web pages using different tags, tables, forms, frames and style sheets supported by HTML.	
				OE-EC704A.2	Implement, compile, test and run Java programs, comprising more than one class, to address a particular software problem.	
				OE-EC704A.3	Demonstrate the ability to employ various types of selection statements and iteration statements in a Java program.	
				OE-EC704A.4	be able to leverage the object-oriented features of Java language using abstract class and interface.	
				OE-EC704A.5	be able to handle errors in the program using exception handling techniques of Java.	
				OE-EC704A.6	Design applets as per the requirements with event handling facility.	
ECE-UG	Electronics and Communication Engineering (B.Tech)	PE-EC801A	Antennas and Propagation	PE-EC801A.1	Understand the properties and various types of antennas.	
				PE-	Analyze the properties of different types of	

				EC801A.2	antennas and their design.
				PE-EC801A.3	Operate antenna design software tools and come up with the design of the antenna of required specifications.
ECE-UG	Electronics and Communication Engineering (B.Tech)	PE-EC802C	VLSI Design Automation	PE-EC802C.1	CO1: Understand need for VLSI physical design Automation.
				PE-EC802C.2	CO2: Analyze VLSI automation algorithms for partitioning
				PE-EC802C.3	CO3: Formulate placement, floor planning and pin assignment problems and simulate.
				PE-EC802C.4	CO4: Ability to understand the requirement of simulation in VLSI design
				PE-EC802C.5	CO5: Able to comprehend the basic steps of high-level synthesis
ECE-UG	Electronics and Communication Engineering (B.Tech)	OE-EC803A	Internet of Things(IoT)	OE-EC803A.1	Understand the application areas of IOT
				OE-EC803A.2	Realize the revolution of Internet in Mobile Devices, Cloud & Sensor Networks.
				OE-EC803A.3	Understand building blocks of Internet of Things and characteristics.
				OE-EC803A.4	Understand the interconnection and integration of the
ECE-UG	Electronics and Communication Engineering (B.Tech)	OE-EC804A	Artificial Intelligence	OE-EC804A.1	Understand the modern view of AI as the study of agents that receive precepts from the environment and perform actions.
				OE-EC804A.2	Demonstrate awareness of the major challenges facing AI and the complex of typical problems within the field.
				OE-EC804A.3	Exhibit strong familiarity with a number of important AI techniques, including in particular search, knowledge representation, planning and constraint management.
				OE-EC804A.4	Asses critically the techniques presented and to apply them to real world problems