

Dhanalakshmi Srinivasan Engineering College (Autonomous) – R 2020

Course Outcomes (COs)

Course Name with subject code: COMMUNICATIVE ENGLISH/ U20HS101

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C101.1	Develop the ability to share information about family and friends.
C101.2	Develop your ability to understand and communicate ideas effectively through free writing.
C101.3	Utilize basic grammar techniques to enhance language development.
C101.4	Foster an environment for reading and develop good language skills.
C101.5	Develop flair for any kind of writing with rich vocabulary and proper syntax.
C101.6	Proficiency in writing technical articles and presenting papers on any topic of any genre.

Course Name with subject code: ENGINEERING MATHEMATICS/ U20MA101

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C102.1	Analyze the nature of quadratic forms.
C102.2	Explore the intervals of concavity and convexity.
C102.3	Understand limits and continuity in multivariable functions.
C102.4	Gain proficiency in definite integrals and their properties.
C102.5	Explore applications of multiple integrals in calculating areas and volumes.
C102.6	Understand the concept of triple integrals and their applications in finding volume

Course Name with subject code: ENGINEERING PHYSICS – I/ U20PH101

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C103.1	Calculate inter-planar spacing, number of atoms per unit cell, atomic radius, coordination number, and packing factor for different crystal structures.
C103.2	Comprehend the concepts of elasticity, plasticity, and Hooke's law.
C103.3	Learn about the properties and production methods of ultrasonic waves.
C103.4	Understand the principles of black body radiation, Planck's hypothesis, and radiation laws.
C103.5	Understand the properties of lasers, population inversion, and pumping methods.
C103.6	Learn about different types of lasers, their uses, and holography.

Course Name with subject code: ENGINEERING CHEMISTRY/ U20CY101

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C104.1	Understand types (addition, condensation, copolymerization), mechanisms, functionality, and degree of polymerization.
C104.2	Learn about types, isotherms, and applications in pollution control.
C104.3	Acquire knowledge of thermodynamic terminology, including the second law and entropy changes.
C104.4	Understand laws, quantum efficiency, and processes like fluorescence and phosphorescence.
C104.5	Gain insights into the phase rule's components and its application in one-component and two-component systems.
C104.6	Learn about alloying, its significance, and effects on ferrous and non-ferrous alloys, including examples like Nichrome and Stainless steel.

Course Name with subject code: C PROGRAMMING/ U20GE101

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C105.1	Apply decision-making and looping statements effectively in C programs.
C105.2	Develop proficiency in string operations such as length, comparison, concatenation, and copying.
C105.3	Develop the ability to define and use functions, including recursion, and understand the concept of function prototypes.
C105.4	Understand unions and their applications, including their usage with pointers.
C105.5	Acquire skills in file processing, including sequential and random access file handling.
C105.6	Develop the ability to perform file operations such as finding averages and transaction processing using both sequential and random access files.

Course Name with subject code: ENGINEERING GRAPHICS/ U20GE102

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C106.1	Discuss about conics and orthographic views of engineering components.
C106.2	Draw the projection of points, lines and planes.
C106.3	Classify solids and projection of solids at different positions.
C106.4	Show sectioned view of solids and development of surface.
C106.5	Draw isometric projection and perspective views of an object/solid.
C106.6	Apply the concept of drawing in practical applications.

**Course Name with subject code: PHYSICS AND CHEMISTRY LABORATORY/
U20BS101**

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C107.1	Assess optical fibre parameters using laser properties.
C107.2	Measure the velocity of ultrasonic waves in a given liquid medium.
C107.3	Compute the wavelength of mercury spectrum using properties of light.
C107.4	Compute the thermal conductivity of a bad conductor using Lee's method.
C107.5	Determine the modulus of a material using Hooke's law.
C107.6	Estimate water quality parameters such as dissolved oxygen content, chloride content of the water samples.

Course Name with subject code: C PROGRAMMING LABORATORY/ U20GE103

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C108.1	Implement basic input/output operations using appropriate statements.
C108.2	Develop a program to determine leap years based on specified conditions.
C108.3	Utilize appropriate functions and control flow to perform specified operations.
C108.4	Apply mathematical operations and conditional statements to validate Armstrong numbers.
C108.5	Create functions to convert decimal numbers into binary, octal, and hexadecimal formats.
C108.6	Design a program to sort a list of numbers using pass by reference.

Course Name with subject code: FUNCTIONAL ENGLISH/ U20HS201

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C111.1	Breakdown the ideas in to its elementary constituents, analyze and act after a meaning full thought process.
C111.2	Analyze the phrase and passage and explicitly pass on the ideas meaning fully.
C111.3	Manage to interpret the given phrase or the graphical rendering and review the contents well individually or as a group.
C111.4	Concentrate on the communication aspect of complicated ideas and respond positively.
C111.5	Debate the issues and find the rudiments of the problem individually and as a group.
C111.6	Respond intelligently and seek clarification and understand completely.

Course Name with subject code: ADVANCED CALCULUS AND ORDINARY DIFFERENTIAL EQUATIONS/ U20MA201

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C112.1	Solve linear differential equations, including second-order equations with constant coefficients
C112.2	Utilize inverse Laplace transforms and convolution theorem to solve differential equations.
C112.3	Apply line integrals, surface integrals, and volume integrals in various coordinate systems.
C112.4	Describe analytic functions and their properties, including necessary conditions for analyticity.
C112.5	Understand Taylor's and Laurent's series expansions and their applications.
C112.6	Apply Cauchy's integral theorem and formula to evaluate complex integrals.

Course Name with subject code: ENGINEERING PHYSICS – II/ U20PH201

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C113.1	Derive expressions for electrical conductivity, thermal conductivity, and the Wiedemann-Franz law.
C113.2	Describe the properties and types of semiconductors.
C113.3	Calculate energy stored in capacitors and understand dielectric loss and breakdown mechanisms.
C113.4	Analyze ferromagnetic domains, hysteresis, and the properties of soft and hard magnetic materials.
C113.5	Define nanostructures and understand quantum confinement effects.
C113.6	Describe various methods of preparing nanomaterials and their properties.

Course Name with subject code: PYTHON PROGRAMMING/ U20GE201

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C114.1	Apply simple strategies for algorithm development, such as iteration and recursion, to solve basic problems.
C114.2	Create modular programs using functions, understanding function definition, usage, parameters, and arguments.
C114.3	Design fruitful functions with proper parameter passing, return values, and understanding scope.
C114.4	Understand the properties and operations of lists, tuples, and dictionaries in Python.
C114.5	Utilize file handling techniques to read from and write to text files and handle exceptions during file operations.
C114.6	Develop programs that utilize command-line arguments and handle errors and exceptions effectively.

Course Name with subject code: CIRCUIT THEORY/ U20EE201

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C115.1	Analyse the basic electrical circuits
C115.2	Understand and apply various circuit theorems
C115.3	Analyse various Resonance circuits
C115.4	Analyse transient response and know the concepts of coupled circuits
C115.5	Verify various two port networks.
C115.6	Explain three phase 3-wire and 4-wire circuits with star and delta connected loads

Course Name with subject code: SEMICONDUCTOR DEVICES/ U20EC201

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C116.1	Use of electronic devices, tools and instruments in engineering applications.
C116.2	Know broadly the concepts and functionalities of the electronic devices, tools and instruments.
C116.3	Understand use, general specifications and deploy abilities of the electronic devices and assemblies.
C116.4	Operate the basic electronic devices such as PN junction diode, Bipolar and Field Effect Transistors.
C116.5	Understand the concepts on Power control devices, LED, LCD and other Opto-electronic devices.
C116.6	Know the variety of semiconductor devices and its application in day-today life.

**Course Name with subject code: ENGINEERING PRACTICES LABORATORY/
U20GE203**

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C117.1	Identify Tools and Techniques used for Sheet Metal Fabrication.
C117.2	Use welding equipment to join the structures.
C117.3	Demonstrate Plumbing requirements of domestic buildings.
C117.4	Apply the skills of basic electrical engineering for house wiring practice.
C117.5	Measure various electrical quantities.
C117.6	Explain the working of electronic components and its utilization.

**Course Name with subject code: SEMICONDUCTOR CIRCUITS AND SIMULATION
LABORATORY / U20EC202**

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C118.1	Identify various semiconductor devices.
C118.2	Interpret the characteristics of semiconductor devices.
C118.3	Apply the basic knowledge on semiconductor for basic switching applications.
C118.4	Select a right semiconductor device for a given application.
C118.5	Verify Thevenin & Norton theorem KVL & KCL, and Super Position Theorems.
C118.6	Use the software for electronics components.

Course Name with subject code: PYTHON PROGRAMMING LABORATORY/ U20GE204

COURSE OUTCOMES:	
Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C119.1	Understand the concept of greatest common divisor (GCD) and implement an algorithm to compute it efficiently.
C119.2	Demonstrate the ability to find the maximum value in a list of numbers, illustrating skills in list manipulation and algorithm design.
C119.3	Create a program to generate the first n prime numbers, demonstrating proficiency in number theory and algorithm design.
C119.4	Implement matrix multiplication algorithms, showcasing skills in matrix operations and algorithm design.
C119.5	Design a program to find the most frequent words in a text file, demonstrating proficiency in string manipulation and algorithmic analysis.
C119.6	Develop a simulation of a bouncing ball using Pygame, demonstrating proficiency in physics simulations and game development.

Course Name with subject code: Transforms and Partial Differential Equations / U20MA301

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C201.1	Explain the mathematical principles governing partial differential equations.
C201.2	Describe the concept and properties of Fourier series.
C201.3	Analyze and solve boundary value problems using Fourier series techniques.
C201.4	Employ transform techniques to solve ordinary differential equations.
C201.5	Utilize transform techniques to solve partial differential equations.
C201.6	Explain the fundamentals of transformation techniques.

Course Name with subject code: Signals and Systems / U20EC301

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C202.1	Analyze the properties of signals & systems.
C202.2	Analyze CT and DT signal.
C202.3	Apply Fourier transform, Laplace transform and Z transform in signal analysis.
C202.4	Analyze continuous time LTI systems using Fourier Transforms.
C202.5	Analyze continuous time LTI systems using Fourier Transforms.
C202.6	Analyze discrete time LTI systems using Z transform.

Course Name with subject code: Electronic Circuits / U20EC302

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C203.1	Discuss the stability factors of various biasing techniques used in BJT.
C203.2	Discuss the stability factors of various biasing techniques used in FET.
C203.3	Compute the hybrid model for different amplifiers.
C203.4	Manipulate the high frequency analysis of single and multi stage amplifiers.
C203.5	Illustrate the concept of Feedback amplifiers in Electronic Circuits.
C203.6	Demonstrate the working of blocking oscillators and time base circuits.

Course Name with subject code: Digital Integrated Circuits / U20EC303

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C204.1	Get a basic knowledge on the laws of binary logic and will also have an understanding of the various digital logic families.
C204.2	Design various combinational logic circuits.
C204.3	Design various Sequential logic circuits.
C204.4	Analyze, design and implement the synchronous and asynchronous sequential circuits
C204.5	Develop finite state machines.
C204.6	Program programmable logic devices and design a processor.

**Course Name with subject code: Electrical Engineering and Control Systems /
U20EC304**

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C205.1	Understand the principles and characteristics of motors.
C205.2	Know the concepts of transformers.
C205.3	Identify the various control system components and their representations
C205.4	Analyze the various time domain parameters
C205.5	Analyze the stability analysis in various parameters
C205.6	Analysis the various frequency response plots and its system.

Course Name with subject code: Data Structures and OOPS / U20CS301

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C206.1	Explain the concepts of Object oriented programming.
C206.2	Write simple applications using C++.
C206.3	Discuss the different methods of organizing large amount of data.
C206.4	Describe the procedural and object oriented paradigm with concepts of streams, classes, functions, data and objects.
C206.5	Classify inheritance with the understanding of early and late binding, usage of exception handling, generic programming.
C206.6	Apply different techniques in given applications of trees.

Course Name with subject code: Analog and Digital Circuits Laboratory / U20EC305

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C207.1	Design and Test BJT/JFET amplifiers.
C207.2	Test the Frequency responses of BJT/JFET amplifiers.
C207.3	Measure CMRR in differential amplifier.
C207.4	Simulate and analyze amplifier circuits using PSpice
C207.5	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators.
C207.6	Design and Test the digital logic circuits.

Course Name with subject code: Data Structures Laboratory / U20CS302

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C208.1	Write basic and advanced programs in C
C208.2	Apply and Understand the different C programming concepts.
C208.3	Implement functions and recursive functions in C
C208.4	Implement data structures using C
C208.5	Apply binary tree searching concept in data structure.
C208.6	Choose appropriate sorting algorithm for an application and implement it in a modularized way

Course Name with subject code Interpersonal Skills/Listening and Speaking /

U20HS 301

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C209.1	Listen attentively and respond appropriately by taking lecture notes and articulating complete ideas.
C209.2	Demonstrate effective speaking skills by introducing themselves, asking/answering personal information, expressing ability, and seeking clarification with correct pronunciation and intonation.
C209.3	Apply lexical chunking and fluency techniques to participate in everyday conversations such as greetings, describing health, making invitations, and taking leave.
C209.4	Practice active listening and provide appropriate verbal/non-verbal feedback while participating in group discussions and persuasive communication.
C209.5	Develop formal and informal conversational skills and make effective presentations using digital tools.
C209.6	Enhance listening comprehension by interpreting ideas from lectures, interviews, discussions, documentaries, and podcasts with clarity and accuracy.

Course Name with subject code: Probability & Random Processes/U20MA401

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C210.1	Understand the fundamental knowledge of the concepts of probability and have knowledge of standard distributions which can describe real life phenomenon.
C210.2	Understand the basic concepts of one and two dimensional random variables and apply in engineering applications.
C210.3	Apply the concept random processes in engineering disciplines.
C210.4	Understand and apply the concept of correlation and spectral densities.
C210.5	The students will have an exposure of various distribution functions and help in acquiring skills in handling situations involving more than one variable.
C210.6	Analyze the response of random inputs to linear time invariant system.

**Course Name with subject code: Environmental Science and Engineering
/U20HS202**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C211.1	Explain why an ecosystem is an open system.
C211.2	Public participation is an important aspect which serves the environmental Protection.
C211.3	Public awareness of environmental is at infant stage.
C211.4	Ignorance and incomplete knowledge has lead to misconceptions
C211.5	Development and improvement in standard of living has lead to serious environmental disasters
C211.6	Explain relationship between the human population and environment.

Course Name with subject code: Analog Integrated Circuits/ U20EC401

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C212.1	Discuss the op-amp's basic construction, characteristics, parameter limitations, various configurations and countless applications of op-amp.
C212.2	Analyze the basic op-amp circuits, particularly various linear and non-linear circuits, active filters, signal generators..
C212.3	Analyze the t timer circuits and PLL.
C212.4	Discuss Analog to digital and Digital to Analog Convertors.
C212.5	Analyze the special functions of IC's using wave form generator.
C212.6	Design power amplifier and DC convertors.

Course Name with subject code: Analog and Digital Communication/U20EC402

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C213.1	Understand different blocks in communication system and how noise affects communication using different parameters.
C213.2	Sample analog signal and recover original signal without any distortion.
C213.3	Differentiate between different pulse modulation and demodulation techniques and signal multiplexing for various applications.
C213.4	Understand the basics of information theory, source coding techniques and calculate Entropy of source.
C213.5	Understand the generation, detection signal space diagram, spectrum, bandwidth efficiency, and probability of error analysis of different band pass modulation techniques.
C213.6	Analyze the concepts of Multiplexing and Access Techniques

Course Name with subject code: Electromagnetic Fields/U20EC403

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C214.1	Basic knowledge of static electric and magnetic field principles and related laws governing them.
C214.2	Write Maxwell's equations in integral, differential and phasor forms and explain their physical meaning.
C214.3	Ability to derive wave equations for electromagnetic wave propagation in free space and media.
C214.4	Ability to analyze the characteristics of wave propagation in parallel plate, rectangular and circular waveguides.
C214.5	Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws.
C214.6	Analyze the concepts of EM waves for transmission lines

**Course Name with subject code: Environmental Science and Engineering
/U20HS202**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C215.1	Explain why an ecosystem is an open system.
C215.2	Public participation is an important aspect which serves the environmental Protection.
C215.3	Public awareness of environmental is at infant stage.
C215.4	Ignorance and incomplete knowledge has lead to misconceptions
C215.5	Development and improvement in standard of living has lead to serious environmental disasters
C215.6	Explain relationship between the human population and environment.

**Course Name with subject code: Analog and Digital Communication
Laboratory/U20EC405**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C216.1	Design, construct and Test the circuit of Analog modulation and demodulation.
C216.2	Design, construct and Test the circuit for Digital modulation and demodulation.
C216.3	Design, construct and Test the circuit for Pulse modulation and demodulation.
C216.4	Demonstrate their knowledge in base band signalling schemes through implementation of digital modulation schemes.
C216.5	Design and analyze the reconstruction of the signal from its samples.
C216.6	Simulating feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool by using op-amp

**Course Name with subject code: Integrated Circuits and Simulation Laboratory
/U20EC404**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C217.1	Analyze various types of feedback amplifiers.
C217.2	Design tuned amplifiers, wave-shaping circuits.
C217.3	Design multivibrator circuits
C217.4	Design and simulate feedback amplifiers using SPICE Tool.
C217.5	Design and simulate oscillators using SPICE Tool.
C217.6	Simulating tuned amplifiers, wave-shaping circuits and multivibrators using SPICE Tool.

Course Name with subject code: Transmission Lines and Waveguides /U20EC501

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C301.1	Explain the propagation characteristics of electromagnetic waves in transmission lines
C301.2	Analyze signal propagation at Radio Frequencies
C301.3	Solve the transmission line parameters using Smith chart
C301.4	Describe the characteristics of guided waves between parallel planes, rectangular waveguide and circular waveguide.
C301.5	Explain the various types of filters.
C301.6	Calculate the resonance frequency of cavity resonators and the associated modal field.

Course Name with subject code: Digital Signal Processing / U20EC502

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C302.1	Compute DFT and FFT algorithms.
C302.2	Design the FIR and IIR filters.
C302.3	Analyze the quantization errors in filters and avoiding.
C302.4	Understand the Multirate Digital Signal Processing.
C302.5	Understand and write program using DSP Processors.
C302.6	Gain Knowledge on various signal processors.

Course Name with subject code: Processors and Controllers /U20EC503

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C303.1	Write assembly language program in 8085 and 8086 for various applications.
C303.2	Impart knowledge on the architecture and software aspects of microprocessor 8086.
C303.3	Design the memory and IO interfacing with 8085, 8086 and 8051.
C303.4	Give an overview on the architecture and basic concepts of microcontroller.
C303.5	Write assembly language program in microcontroller 8051 for various application.
C303.6	Get Knowledge on Multi-Processor and High end Processors

Course Name with subject code: Adhoc and Sensor Networks / U20EC504

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C304.1	Examine the various wireless sensor networking strategies.
C304.2	Evaluate the different types of architecture used in sensor networks.
C304.3	Analyze the technical issues related to networking of sensors.
C304.4	Synthesize knowledge to control the sensor network.
C304.5	Design and build a wireless sensor network using simulators.
C304.6	Explain the concepts on topologies.

**Course Name with subject code: Communication Networks and Architecture
/U20EC505**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C305.1	Identify the components required to build different types of networks.
C305.2	Understand the protocols for user applications.
C305.3	Describe data representation, instruction formats and the operation of a digital computer.
C305.4	Discuss about implementation schemes of control unit and pipeline performance.
C305.5	Explain the concept of various memories, interfacing and organization of multiple processors.
C305.6	Explain the concepts and performance of Routing protocols.

**Course Name with subject code: Processor and Controllers Laboratory
/U20EC506**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C306.1	Execute new assembly language programs using instruction sets of 8085, 8086 and 8051
C306.2	Interface different I/Os with processor.
C306.3	Generate waveforms using Microprocessors.
C306.4	Execute Programs in 8051.
C306.5	Recreate programs using the knowledge of instruction set of 8085, 8086 and 8051 with the help of trainer kit and MASM software.
C306.6	Analyze finite word length effect on DSP system.

**Course Name with subject code: Signal Processing and Networking Laboratory
/U20EC507**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C307.1	Carryout basic signal processing operations.
C307.2	Demonstrate their abilities towards MATLAB based implementation of various DSP systems.
C307.3	Simulate& validate the various functional modules of a communication system.
C307.4	Demonstrate their knowledge in baseband signalling schemes through implementation of digital modulation schemes.
C307.5	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of communication system.
C307.6	Simulate end-to-end communication Link.

Course Name with subject code: Antenna and Wave Propagation /U20EC601

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C308.1	Identify and measure the basic antenna parameters.
C308.2	Explain the radiation through antenna and identify different types of antennas based on frequency.
C308.3	Design and analyze wire and aperture antennas.
C308.4	Design and analyze matching and feeding networks for antennas.
C308.5	Identify the characteristics of radio-wave propagation.
C308.6	Understand the knowledge on Special antennas

Course Name with subject code: VLSI Circuits and CAD Design /U20EC602

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C309.1	Explain the concepts of MOS transistors operations and their characteristics.
C309.2	Explain the fabrication process of CMOS technology.
C309.3	Outline floor planning and routing.
C309.4	Explain Simulation and Logic Synthesis.
C309.5	Discuss the hardware models for high level synthesis.
C309.6	Understand the knowledge on Backend process

Course Name with subject code: Image and Video Processing /U20EC603

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C310.1	Discuss digital image and video fundamentals.
C310.2	Apply image enhancement and restoration techniques.
C310.3	Use image compression and segmentation Techniques.
C310.4	Represent features of images and video.
C310.5	Explain the 2-D motion estimation process.
C310.6	Explain and represent the features of an image.

Course Name with subject code: Satellite Communication and Remote Sensing
/U20EC604

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C311.1	Understand the working and operation of various sub systems of satellite as well as the earth station.
C311.2	Apply various communication techniques for satellite applications
C311.3	Analyze and design satellite communication link
C311.4	Identify the earth surface features from satellite images.
C311.5	Analyze the energy interactions in the atmosphere and earth surface features.
C311.6	Analyze the understand the concepts on Data Acquisitions and Analysis

Course Name with subject code: Electronic Systems Design Laboratory
/U20EC605

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C312.1	Design different forms of power supply.
C312.2	Design Voltage regulators
C312.3	AM/FM transceiver.
C312.4	Know the design procedure of Instrumentation amplifier and Digital Indicator.
C312.5	Learn CAD based PCB layout design.
C312.6	Design Logic Controllers using Ladder Diagrams

**Course Name with subject code: VLSI and Image Processing Laboratory
/U20EC606**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C313.1	Perform enhancing and segmentation operations on the image using spatial filters.
C313.2	Write HDL code for basic as well as advanced digital integrated circuit.
C313.3	Import the logic modules into FPGA Boards.
C313.4	Synthesize Place and Route the digital IPs.
C313.5	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDA tools.
C313.6	Simulate and Extract the layouts of Analog IC Blocks using CADENCE / MENTOR GRAPHICS / EQUIVALENT tools.

Course Name with subject code: Broadband Wireless Communication / U20EC701

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C401.1	Characterize Multiple access Techniques
C401.2	Design and implement various signaling schemes for fading channels
C401.3	Compare Modulation and Detection techniques.
C401.4	Compare Equalization & Diversity Techniques and analyze their performance
C401.5	Design and implement systems with transmit/receive diversity
C401.6	Analyze the methods on MIMO systems and their performance

Course Name with subject code: Microwave Theory and Circuits / U20EC702

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C402.1	Design active and passive microwave components.
C402.2	Capability to design RF circuits.
C402.3	Able to design impedance matching networks for any transmission line or system
C402.4	Analyze RF circuits
C402.5	Summarize the process, advantages and applications of microwave integrated components
C402.6	Explain the concepts of Amplifiers used in microwave

**Course Name with subject code: Fiber Optic Communication and Networks /
U20EC703**

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C403.1	Examine the various optical fiber modes, configurations.
C403.2	Evaluate the various signal degradation factors associated with Optical fiber.
C403.3	Apply the various optical sources and optical detectors and their use in the optical communication system.
C403.4	Compare the fiber optic receiver and measurements.
C403.5	Analyze the digital transmission and its associated parameters on system performance.
C403.6	Outline the concept of SONET/SDH and WDM.

Course Name with subject code: Real Time Systems Design / U20EC704

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C404.1	Analyze the embedded systems specifications and develop software programs
C404.2	Revise computing platform and design analysis
C404.3	Demonstrate multiple tasks and multi processes
C404.4	Discuss hardware and software co-design
C404.5	Evaluate the requirements of programming embedded systems
C404.6	Explain system design techniques to develop software for embedded systems.

Course Name with subject code: Microwave and Optical Laboratory/U20EC705

Course Code	Course Outcomes
	<i>On Successful completion of the course, Students will be able to,</i>
C405.1	Demonstrate the structure and operation of various antennas and to describe their parameters.
C405.2	Apply basic theorems to analyze the variation of field strength of radiated waves.
C405.3	Measure the radiation pattern of wired, aperture, planar and array antennas.
C405.4	Familiar with EM simulation tools to implement antenna prototypes.
C405.5	Measure the frequency and wavelength of an antenna
C405.6	Understand the concepts of microwave components for measuring

Course Name with subject code: Project Work - Phase I/ U20EC706

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C406.1	Identify and formulate real-world engineering problems based on literature survey and societal needs.
C406.2	Conduct an extensive literature review to analyze existing solutions and technologies.
C406.3	Define clear project objectives, scope, and methodology aligned with engineering principles.
C406.4	Develop a detailed plan of action including initial design concepts or simulation models.
C406.5	Demonstrate effective communication skills through technical seminar presentations and preliminary reporting.
C406.6	Work collaboratively in a team environment while adhering to professional ethics and project management practices.

Course Name with subject code: Project Work - Phase II/ U20EC801

Course Code	Course Outcomes
	<i>Upon completion of the course, the students will be able to:</i>
C407.1	Identify and formulate the research problem clearly and precisely based on prior work.
C407.2	Design and develop effective solutions to the identified engineering problem.
C407.3	Analyze and solve complex problems through experiments, simulations, and data interpretation.
C407.4	Plan, implement, and execute the project systematically with efficient resource and time management.
C407.5	Write detailed technical reports and document the project work comprehensively.
C407.6	Present project outcomes effectively through seminars, demonstrating communication and presentation skills.