Department of Electronics & Communication Engineering
Regulation 2021

Course Outcomes

Semester I

Course Name HS3152- Professional English – I

CO1	Utilize suitable language in professional settings.
CO2	Develop a strong understanding of essential grammatical structures and effectively utilize them in diverse contexts.
CO3	Interact with technical texts to uncover both their apparent and hidden significances, comprehensively exploring not just their technical complexities but also their nuanced interpretations.
CO4	Examine and interpret data presented in tables, charts, and other visual formats.
CO5	Compose definitions, descriptions, narratives, and essays covering a wide range of topics.

Course Name MA3151 Matrices and Calculus

CO1	Apply matrix algebra techniques to address real-world problems.
CO2	Apply methods from differential calculus to address a variety of practical problems.
CO3	Able to employ principles from differential calculus in addressing functions involving multiple variables.
CO4	Utilize a variety of integration techniques to effectively tackle real-world problems.
CO5	Apply concepts of multiple integrals to solve problems involving areas, volumes, and various practical situations.

Course Name PH3151 Engineering Physics

CO1	Understand the importance of mechanics.
CO2	Express their knowledge in electromagnetic waves.
CO3	Demonstrate a strong foundational knowledge in oscillations, optics and lasers.
CO4	Understand the importance of quantum physics.
CO5	Comprehend and apply quantum mechanical principles towards the formation of energy bands.

Course Name CY3151 Engineering Chemistry

CO1	Interpret the water quality parameters and water treatment techniques.
CO2	Demonstrate the basic principles and preparatory methods of nanomaterials.
CO3	Illustrate the basic concepts and applications of phase rule and composites.
CO4	Facilitate the understanding of different types of fuels, their preparation, properties and combustion characteristics.
CO5	Familiarize the students with the operating principles, working processes and applications of energy conversion and storage devices.

Course Name GE3151 Problem Solving and Python Programming

CO1	Develop algorithmic solutions to simple computational problems.
CO2	Develop and execute simple Python programs
CO3	Write simple Python programs using conditionals and loops for solving problems.
CO4	Decompose a Python program into functions.
CO5	Illustrate compound data using Python lists, tuples, dictionaries etc
CO6	write data from/to files in Python programs

Course Name GE3152 தமிழர் மரபு /Heritage of Tamils

CO1	Discuss the tamil heritage sand literature
CO2	Discuss about the paintings modern art sculpture
CO3	Illustrate the folk marital arts
CO4	Understand the sangam age through tamil literature
CO5	Discuss the contribution of tamil literature in Indian civilization

Course Name GE3171 Problem Solving and Python Programming Laboratory

CO1	Develop algorithmic solutions to simple computational problems
CO2	Develop and execute simple Python programs.
CO3	Implement programs in Python using conditionals and loops for solving
CO4	Deploy functions to decompose a Python program.
CO5	Explain the Process compound data using Python data structures.
CO6	Utilize Python packages in developing software applications

Course Name BS3171 Physics and Chemistry Laboratory

CO1	Understand the functioning of various physics laboratory equipment.
CO2	Use graphical models to analyze laboratory data.
CO3	Use mathematical models as a medium for quantitative reasoning and describing physical reality.

CO4	Access, process and analyze scientific information.
CO5	Solve problems individually and collaboratively.
CO6	Analyse the quality of water samples with respect to their acidity, alkalinity, hardness and DO.
CO7	Determine the amount of metal ions through volumetric and spectroscopic techniques
CO8	Analyse and determine the composition of alloys
CO9	Learn simple method of synthesis of nano particles
CO 10	Quantitatively analyse the impurities in solution by electro analytical techniques

Course Name GE3172 English Laboratory

CO1	Engage in active listening to effectively absorb and comprehend a broad spectrum of academic information, ranging from general concepts to more complex topics.
CO2	Listen attentively and understand various perspectives presented in a discussion.
CO3	Communicate fluently and accurately in both formal and informal contexts.
CO4	Describe products and processes clearly and accurately, elucidating their uses and purposes effectively.
CO5	Express opinions adeptly in both formal and informal discussions.

Semester II

Course Name HS3252 Professional English - II

CO1	Analyze and differentiate between products and ideas in technical texts, highlighting their similarities and differences.
CO2	Identify and document cause-and-effect relationships within events and industrial processes by analyzing technical texts.
CO3	Examine issues thoroughly to develop practical solutions and convey them effectively through written communication.
CO4	Express their ideas and opinions in an organized and coherent manner.
CO5	Compose compelling resumes tailored to the specifics of job searches.

Course Name MA3251 Statistics and Numerical Methods

CO1	Utilize the hypothesis testing concept for both small and large samples in real-world scenarios.
CO2	Apply fundamental concepts of experimental design classifications in agricultural practices.
CO3	Understand the numerical interpolation techniques across different

	intervals and apply numerical methods for differentiation and integration to solve engineering problems.
CO4	Understand the knowledge of various techniques and methods for solving first and second order ordinary differential equations.
CO5	Utilize specific techniques with engineering applications to solve partial and ordinary differential equations with initial and boundary conditions.

Course Name PH3254 Physics for Electronics Engineering

CO1	Know basics of crystallography and its importance for varied materials properties
CO2	Gain knowledge on the electrical and magnetic properties of materials and their applications
CO3	Understand clearly of semiconductor physics and functioning of semiconductor devices
CO4	Understand the optical properties of materials and working principles of various optical devices
CO5	Appreciate the importance of nanotechnology and nanodevices.

Course Name BE3254 Electrical and Instrumentation Engineering

CO1	Explain the working principle of electrical machines
CO2	Analyze the output characterizes of electrical machines
CO3	Choose the appropriate electrical machines for various applications
CO4	Explain the types and operating principles of measuring instruments
CO5	Explain the basic power system structure and protection schemes

Course Name EC3251 Circuit Analysis

CO1	Apply the basic concepts of circuit analysis such as Kirchoff's laws, mesh current and node voltage method for analysis of DC and AC circuits
CO2	Apply suitable network theorems and analyze AC and DC circuits
CO3	Analyze steady state response of any R, L and C circuits
CO4	Analyze the transient response for any RC, RL and RLC circuits and frequency response of parallel and series resonance circuits
CO5	Analyze the coupled circuits and network topologies

Course Name GE3252 தமிழரும் தததொழில்நுட்பமும் /Tamils and Technology

CO1	Learn about weaving and ceramic methods in sangam period
CO2	experience support art and sculpture in sangam period
CO3	Make and use of metals in sangam period
CO4	Apply the knowledge on what are management in sangam period
CO5	Implementing the digitalization in Tamil period

Course Name EC3271 Circuits Analysis Laboratory

CO1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work
CO2	Wire various electrical joints in common household electrical wire work.

Course Name GE3272 Communication Laboratory / Foreign Language $

CO1	Communicate effectively in group discussions conducted in formal or semi-formal settings.
CO2	Participate actively in discussions; thoroughly examine concepts and issues from multiple angles, and articulate conclusions to identify appropriate solutions.
CO3	Create emails, letters, and job applications that are refined and have a strong impact.
CO4	Compose critical reports that effectively communicate data and information with clarity and precision.
CO5	Deliver accurate and pertinent instructions and recommendations to ensure tasks are executed safely and effectively.

Course Name GE3271 ENGINEERING PRACTICES LABORATORY

CO1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan; make joints in wood materials used in common household wood work
CO2	Design the various electrical joints in common household electrical wire work.
CO3	Assemble simple mechanical assembly of common household equipment's; Make a tray out of metal sheet using sheet metal work Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts;
CO4	Assemble and test simple electronic components on PCB. Solder and test simple electronic circuits;

Semester III

Course Name MA3355 Random Processes and Linear Algebra

CO1	Explain the fundamental concepts of advanced algebra and their role in modernmathematics and applied contexts
CO2	Explain the fundamental concepts of advanced algebra and their role in modernmathematics and applied contexts
CO3	Apply the concept of random processes in engineering disciplines.
CO4	Understand the fundamental concepts of probability with a thorough knowledge of standard distributions that can describe certain real-life phenomenon.
CO5	Understand the basic concepts of one- and two-dimensional random variables and applythem to model engineering problem

Course Name CS3353 C Programming and Data Structures

CO1	Develop C programs for any real world/technical application.
CO2	Apply advanced features of C in solving problems
CO3	Write functions to implement linear and non–linear data structure operations.
CO4	use appropriate linear/non–linear data structure operations for solving a given problem.
CO5	Appropriately use sort and search algorithms for a given application

Course Name EC3354 Signals and Systems

CO1	Identify and determine if a given system is linear, causal, or stable.
CO2	Analyze and determine the frequency components present in a deterministic signal
CO3	Identify and characterize continuous LTI systems in the time domain and frequency domain
CO4	Characterize discrete LTI systems in the time domain and frequency domain.
CO5	Determine, calculate, and compute the output of an LTI system in the time and frequency domains

Course Name EC3353 Electronic Devices and Circuits

CO1	Explain the structure and working operation of basic electronic devices.
CO2	Design and analyze amplifiers.
CO3	Analyze frequency response of BJT and MOSFET amplifiers
CO4	Design and analyze feedback amplifiers and oscillator principles.
CO5	Design and analyze power amplifiers and supply circuits

Course Name EC3351 Control Systems

CO1	Compute the transfer function of different physical systems.
CO2	Analyze the time domain specification and calculate the steady state error.
CO3	Illustrate the frequency response characteristics of open loop and closed loop system response
CO4	Analyze the stability using Routh and root locus techniques.
CO5	Illustrate the state space model of a physical system and discuss the concepts of sampled data control system.

Course Name EC3352 Digital Systems Design

CO1	Use Boolean algebra and simplification procedures relevant to digital logic.
CO2	Design various combinational digital circuits using logic gates.
CO3	Analyze and design synchronous sequential circuits.
CO4	Analyze and design asynchronous sequential circuits.
CO5	Build logic gates and use programmable devices

Course Name EC3361 Electronic Devices and Circuits Laboratory

CO1	Characterize the PN Junction Diode and Zener diode.
CO2	Design and Testing of BJT and MOSFET amplifiers
CO3	Design and test the Operation of power amplifiers.

Course Name CS3362 C Programming and Data Structures Laboratory

CO1	Use different constructs of C and develop applications
CO2	Write functions to implement linear and non-linear data structure operations
CO3	use the appropriate linear / non-linear data structure operations for a given problem
CO4	Apply appropriate hash functions that result in a collision free scenario for data storage and Retrieval
CO5	Implement Sorting and searching algorithms for a given application

Course Name GE3361 Professional Development

CO1	Use MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
CO2	Use MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
CO3	Use MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs, interlinking other elements, and using media objects.

Semester IV

Course Name EC3452 Electromagnetic Fields

CO1	Relate the fundamentals of vector, coordinate system to electromagnetic concepts
CO2	Analyze the characteristics of Electrostatic field
CO3	Interpret the concepts of Electric field in material space and solve the boundary conditions
CO4	Interpret the concepts of Electric field in material space and solve the boundary conditions
CO5	Determine the significance of time varying fields

Course Name EC3401 Networks and Security

CO1	Explain the Network Models, layers and functions
CO2	Categorize and classify the routing protocols.
CO3	List the functions of the transport and application layer.
CO4	Evaluate and choose the network security mechanisms
CO5	Discuss the hardware security attacks and countermeasures.

Course Name EC3451 Linear Integrated Circuits

CO1	Design linear and nonlinear applications of OP – AMPS
CO2	Design applications using analog multiplier and PLL
CO3	Design ADC and DAC using OP – AMPS
CO4	Generate waveforms using OP – AMP Circuits
CO5	Analyze special function ICs

Course Name EC3492 Digital Signal Processing

CO1	Apply DFT for the analysis of digital signals and systems
CO2	Design IIR and FIR filters
CO3	Characterize the effects of finite precision representation on digital filters
CO4	Design multirate filters
CO5	Apply adaptive filters appropriately in communication systems

Course Name EC3491 Communication Systems

CO1	Demonstrate the concept of amplitude modulation techniques
CO2	Demonstrate the concepts of Random Process to the design of communication systems
CO3	Analyze the digital modulation techniques
CO4	Analyze the concept of sampling and quantization
CO5	Demonstrate the importance of demodulation techniques

Course Name GE3451 Environmental Sciences and Sustainability

CO1	Evaluate the basic concepts of environment, ecosystems and biodiversity and emphasize on the biodiversity of India and its conservation.
CO2	Illustrate the causes, effects and control or prevention measures of environmental pollution and natural disasters.
CO3	Assess and understanding of global and Indian scenario of renewable and non-renewable resources, causes of their degradation and measures to preserve them.
CO4	Familiarize the concept of sustainable development goals and appreciate the interdependence of economic and social aspects of sustainability, recognize and analyze climate changes, concept of carbon credit and the challenges of environmental management.
CO5	Inculcate and embrace sustainability practices and develop a broader understanding on green materials, energy cycles and analyze the role of sustainable urbanization.

Course Name EC3461 Communication Systems Laboratory

CO1	Design AM, FM & Digital Modulators for specific application
CO2	Compute the sampling frequency for digital modulation.
CO3	Simulate & validate the various functional modules of Communication system
CO4	Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes.
CO5	Apply various channel coding schemes & demonstrate their capabilities towards the improvement of the noise performance of Communication system

Course Name EC3462 Linear Integrated Circuits Laboratory

CO1	Analyze various types of feedback amplifiers
CO2	Design oscillators, tuned amplifiers, wave-shaping circuits and multivibrators
CO3	Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave- shapingcircuits and multivibrators, filters using SPICE Tool.
CO4	Design amplifiers, oscillators, D-A converters using operational amplifiers
CO5	Design filters using op-amp and perform an experiment on frequency response

Course Name EC3501 Wireless Communication

CO1	Understand The Concept And Design Of A Cellular System.
CO2	Understand Mobile Radio Propagation And Various Digital Modulation Techniques
CO3	Understand The Concepts Of Multiple Access Techniques And Wireless Networks
CO4	Characterize a wireless channel and evolve the system design specifications
CO5	Design a cellular system based on resource availability and traffic demands

Course Name EC3552 VLSI and Chip Design

CO1	Identify the concepts of digital building blocks using MOS transistor.
CO2	Understand Combinational Logic Circuits and Design Principles
CO3	Understand Sequential Logic Circuits and Clocking Strategies
CO4	Understand Memory architecture and building blocks
CO5	Understand the ASIC Design Process and Testing

Course Name EC3551 Transmission lines and RF Systems

CO1	Explain the characteristics of transmission lines and its losses.
CO2	Calculate the standing wave ratio and input impedance in high frequency transmission lines.
CO3	Analyze impedance matching by stubs using Smith Charts.
CO4	Comprehend the characteristics of TE and TM waves.
CO5	Design a RF transceiver system for wireless communication

Course Name Professional Elective I CEC366 Image Processing

CO1	Interpret and understand the basics and fundamentals of digital image processing, such as digitization, sampling, quantization, and 2D-transforms.
CO2	Apply images processing techniques such as smoothing, sharpening and enhancement.
CO3	Understand the restoration concepts and filtering techniques.
CO4	Demonstrate the basics of segmentation, features extraction, compression and recognition methods for color models.
CO5	Analyze image compression concepts.

Course Name Professional Elective II CEC345 Optical Communication & Networks

CO1	Realize Basic Elements In Optical Fibers, Different Modes And Configurations.
CO2	Analyze The Transmission Characteristics Associated With Dispersion And PolarizationTechniques.
CO3	Design Optical Sources And Detectors With Their Use In Optical

	Communication System.
CO4	Construct Fiber Optic Receiver Systems, Measurements And Techniques.
CO5	Design Optical Communication Systems And Its Networks.

Course Name Professional Elective III CEC333 Advanced Wireless Communication Techniques

CO1	Evaluate how understanding the necessity and design aspects of cooperative communication
CO2	Remember that the students should be able to appreciate both the necessity and the design aspects of green wireless
CO3	Evaluate the students ability to evolve a new technique in wireless communication
CO4	Apply mathemetics models to demonstrate their feasibility using simulation tools
CO5	Analyse the impact of green engineering solution within a global economic

Course Name EC3561 VLSI Laboratory

CO1	Write HDL code for basic as well as advanced digital integrated circuit
CO2	Apply the logic modules into FPGA Boards
CO3	Synthesize Place and Route the digital Ips
CO4	Design, Simulate and Extract the layouts of Digital & Analog IC Blocks using EDAtools
CO5	Test and Verification of IC design

Course Name MX3084 Disaster Risk Reduction and Management

CO1	Understand the concepts of Disaster, Vulnerability and Disaster Risk reduction (DRR)
CO2	Explain the concept of Hazards, Vulnerability and Disaster Risk Assessment prevention and risk reduction
CO3	Develop disaster response skills by adopting relevant tools and technology

Semester VI
Course Name ET3491 Embedded Systems and IOT Design

CO1	Explain the architecture and features of 8051
CO2	Develop a model of an embedded system.
CO3	List the concepts of real time operating systems
CO4	Analyze the architecture and protocols of IoT.
CO5	Design an IoT based system for any application.

Course Name CS3491 Artificial Intelligence and Machine Learning

CO1	Use appropriate search algorithms for problem solving
CO2	Apply reasoning under uncertainty
CO3	Build supervised learning models
CO4	Build ensembling and unsupervised models
CO5	Build deep learning neural network models

Course Name Open Elective– I CCW332 Digital Marketing

CO1	Examine and explore the role and importance of digital marketing in today'srapidly changing business environment.
CO2	Understand the concept of how digital marketing can be utilized by organizations and how itseffectiveness can be measured.
CO3	Understand the key elements of a digital marketing strategy.
CO4	Understand the concept of how the effectiveness of a digital marketing campaign can be measured.
CO5	Demonstrate advanced practical skills in common digital marketing tools such asSEO, SEM, Social media and Blogs

Course Name Professional Elective IV CEC352 Satellite Communication

CO1	Identify the satellite orbits.
CO2	Analyze the satellite subsystems.
CO3	Evaluate the satellite link power budget.
CO4	Identify access technology for satellite.
CO5	Design various satellite applications.

Course Name Professional Elective V CEC331 4G/5G Communication Networks

CO1	Evaluate the evolution of wireless networks.
CO2	Explain the concepts of 5G networks.
CO3	Analyze the 5G architecture and protocols
CO4	Explain the dynamic spectrum management.
CO5	Evaluate the security aspects of 5G networks

Course Name Mandatory Course-II MX3085 Well Being with Traditional Practices - Yoga, Ayurveda and Siddha

CO1	Evaluate the importance of different components of health
CO2	Understand the confidence to lead a healthy life
CO3	Understand the new techniques to prevent lifestyle health disorders
CO4	Understand the importance of diet and workouts in maintaining health

Semester VII

Course Name GE3791 Human Values and Ethics

CO1	Identify the importance of democratic, secular and scientific values in harmonious functioning of social life
CO2	Discuss the democratic and scientific values in both their personal and professional life
CO3	Evaluate rational solutions to social problems
CO4	Understand the ethical manner in society
CO5	Discuss the critical thinking and the pursuit of truth.

Course Name GE3751 Principles of Management

CO1	Understand managerial functions like planning, organizing, staffing, leading & controlling
CO2	Understand the basic knowledge on international aspect of management.
CO3	Understand management concept of organizing
CO4	Understand management concept of directing
CO5	Understand management concept of controlling.

Course Name Open Elective – IV OHS352 Project Report Writing

CO1	Write effective project reports.
CO2	Use statistical tools with confidence.
CO3	Explain the purpose and intension of the proposed project coherently and with clarity
CO4	Create writing texts to suit achieve the intended purpose
CO5	Develop the structure of a technical and project report.

Course Name Open Elective – III CPE334 Energy Conservation and Management

CO1	Describe the knowledge for Basic combustion and furnace design and selection of thermal and mechanical energy equipment.
CO2	State the Importance of Stoichiometry relations, Theoretical air required for complete combustion
CO3	Analyze the Skills on combustion thermodynamics and kinetics
CO4	Apply calculation and design tube still heaters
CO5	Demonstrate the different heat treatment furnace
CO6	Review the Practical and theoretical knowledge burner design

Course Name EC3711 Summer internship

CO1	Understand the System-level design processes, verification and validation techniques, manufacturing and production processes in the firm or research facilities in the laboratory/research institute
CO2	Analyze the industrial / research problems and their solutions
CO3	Compute the system specifications, design methodologies, process parameters, testing parameters and results
CO4	Build the technical report and presentation

Semester VIII

Course Name EC3811 Project Work / Internship

CO1	Formulate and analyze problem / create a new product/ process.
CO2	Design and conduct experiments to find solution
CO3	Analyze the results and provide solution for the identified problem, prepare project report and make presentation.