



SRI BHARATHI ENGINEERING COLLEGE FOR WOMEN

(Approved by AICTE, Affiliated to Anna University, Chennai, India)

Kaikkurichi, Pudukkottai – 622 303

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

REGULATION 2021

COURSE OUTCOMES (CO)

I SEMESTER

HS3152 PROFESSIONAL ENGLISH - I

Students will be able to

CO1	Use appropriate words in a professional context.
CO2	Explain the basic grammatic structures and use them in right context.
CO3	Describe the denotative and connotative meanings of technical texts
CO4	Summarize about the definitions, descriptions, narrations and essays on various topics
CO5	Apply language effectively in professional contexts
CO6	Discuss the importance of read and write complex texts, summaries, articles, blogs, definitions, essays and user manuals.

MA3151 MATRICES AND CALCULUS

Students will be able to

CO1	Use the matrix algebra methods for solving practical problems.
CO2	Apply differential calculus tools in solving various application problems.
CO3	Describe the partial differential equations with initial and Lagrange's method by using certain techniques with engineering applications.
CO4	Carry out the differentiation to solve maxima and minima problems.
CO5	Explain different methods of integration in solving practical problems.
CO6	Determine multiple integral ideas in solving areas, volumes and other practical problems.

PH3151 ENGINEERING PHYSICS

Students will be able to

CO1	Acknowledge the importance of mechanics.
CO2	Express their knowledge in electromagnetic waves.
CO3	Demonstrate a strong foundational knowledge in oscillations.
CO4	Establish a strong foundational knowledge in fibre optics and laser.
CO5	Comprehend the importance of quantum physics.
CO6	Comprehend and apply quantum mechanical principles towards the formation of energy bands.

CY8151 ENGINEERING CHEMISTRY

Students will be able to

CO1	Describe the quality of water from quality parameter data and propose suitable treatment methodologies to treat water.
CO2	Apply basic concepts of nanoscience and nanotechnology in designing the synthesis of nanomaterials for engineering and technology applications.
CO3	Use the knowledge of phase rule and composites for material selection requirements.
CO4	Explain the recommend suitable fuels for engineering processes and applications
CO5	Discuss the different forms of energy resources and apply them for suitable applications in energy sectors.
CO6	Determine the importance of engineering materials, fuels, energy sources and water treatment techniques will facilitate better understanding of engineering processes and applications for further learning.



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COURSE OUTCOMES (CO)

GE3151 PROBLEM SOLVING AND PYTHON PROGRAMMING

Students will be able to

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

GE3152 HERITAGE OF TAMILS

Students will be able to

CO1	Discuss the Tamil language and literature.
CO2	Explain about the modern-art sculpture.
CO3	Illustrate the folk and martial arts.
CO4	Describe the Thinaï concepts of Tamil.
CO5	Summarize the contribution of Tamil in Indian culture.
CO6	Define the role of Siddha medicine.

GE3171 PROBLEM SOLVING AND PYTHON PROGRAMMING LABORATORY

Students will be able to

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

BS3171 PHYSICS AND CHEMISTRY LABORATORY

Students will be able to

CO1	Explain the functioning of various physics laboratory equipment
CO2	Use graphical models to analyze laboratory data.
CO3	Apply mathematical models as a medium for quantitative reasoning and describing physical reality.
CO4	Describe products and processes and explain their uses and purposes clearly and accurately. Access, process and analyze scientific information.
CO5	Solve problems individually and collaboratively.
CO6	Determine the amount of metal ions through volumetric and spectroscopic techniques.



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COURSE OUTCOMES (CO)

GE3172 ENGLISH LABORATORY

Students will be able to

CO1	Describe and comprehend general as well as complex academic information.
CO2	Explain different points of view in a discussion.
CO3	Explain formal and informal communicative contexts.
CO4	Describe products and processes and explain their uses and purposes clearly and accurately.
CO5	Express their opinions effectively in both formal and informal discussions.
CO6	Use language efficiently in expressing their opinions via various media.

II SEMESTER

HS3252 PROFESSIONAL ENGLISH - II

Students will be able to

CO1	Compare and contrast products and ideas in technical texts.
CO2	Identify and report cause and effects in events, industrial processes through technical texts.
CO3	Analyse problems in order to arrive at feasible solutions and communicate them in the written format.
CO4	Explain the importance of present their ideas and opinions in a planned and logical manner.
CO5	Design effective resumes in the context of job search.
CO6	Demonstrate an understanding of job applications and interviews for internship and placements.

MA3251 STATISTICS AND NUMERICAL METHODS

Students will be able to

CO1	Apply the concept of testing of hypothesis for small and large samples in real life problems.
CO2	Apply the basic concepts of classifications of design of experiments in the field of agriculture.
CO3	Describe the numerical techniques of interpolation in various intervals.
CO4	Apply the numerical techniques of differentiation and integration for engineering problems.
CO5	Explain various techniques and methods for solving first and second order ordinary differential equations.
CO6	Describe the partial and ordinary differential equations with initial and boundary conditions by using certain techniques with engineering applications.

PH3202 PHYSICS FOR ELECTRICAL ENGINEERING

Students will be able to

CO1	Illustrate the basics of dielectric materials and insulation.
CO2	Gain knowledge on the electrical and magnetic properties of materials and their applications.
CO3	Explain clearly of semiconductor physics and functioning of semiconductor devices.



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COURSE OUTCOMES (CO)

CO4	Describe the optical properties of materials.
CO5	Discuss the working principles of various optical devices.
CO6	Appreciate the importance of nanotechnology and nanodevices.

BE3255 BASIC CIVIL AND MECHANICAL ENGINEERING

Students will be able to

CO1	Observe the profession of Civil and Mechanical engineering.
CO2	Summarize the planning of building, infrastructure and working of Machineries.
CO3	Apply the knowledge gained in respective discipline
CO4	Illustrate the ideas of Civil Engineering applications.
CO5	Describe the ideas of Mechanical Engineering applications.
CO6	Appraise the material, Structures, machines and energy.

GE3251 ENGINEERING GRAPHICS

Students will be able to

CO1	Use BIS conventions and specifications for engineering drawing.
CO2	Construct the conic curves, involutes and cycloid.
CO3	Solve practical problems involving projection of lines.
CO4	Draw the orthographic, isometric and perspective projections of simple solids.
CO5	Draw the development of simple solids.
CO6	Draw engineering curves

EE3251 ELECTRIC CIRCUIT ANALYSIS

Students will be able to

CO1	Explain circuit's behavior using circuit laws.
CO2	Apply mesh analysis/ nodal analysis / network theorems to determine behavior of the given DC and AC circuit.
CO3	Compute the transient response of first order and second order systems to step and sinusoidal input.
CO4	Compute power, line/ phase voltage and currents of the given three phase circuit.
CO5	Explain the frequency response of series and parallel RLC circuits.
CO6	Explain the behavior of magnetically coupled circuits.

GE3252 TAMILS AND TECHNOLOGIES

Students will be able to

CO1	Explain about the weaving and pottery technology inTamilnadu.
CO2	Describe about the design and construction technologyin Tamilnadu.
CO3	Discuss about the manufacturing technology in Tamilnadu.
CO4	Illustrate the agriculture and irrigation technology inTamilnadu.
CO5	Define the growth of science in Tamil.
CO6	Learn the contribution of the Tamils to Indian culture.



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COURSE OUTCOMES (CO)

GE3271 ENGINEERING PRACTICES LABORATORY

Students will be able to

CO1	Draw pipe line plan; lay and connect various pipe fittings used in common household plumbing work; Saw; plan;
CO2	Explain various joints in wood materials used in common household wood work.
CO3	Design various wire electrical joints in common household electrical wire work.
CO4	Weld various joints in steel plates using arc welding work; Machine various simple processes like turning, drilling, tapping in parts; Assemble simple mechanical assembly of common household equipments.
CO5	Solder and test simple electronic circuits; Assemble and test simple electronic components on PCB.
CO6	Design a tray out of metal sheet using sheet metal work.

EE3271 ELECTRIC CIRCUITS LABORATORY

Students will be able to

CO1	Use simulation and experimental methods to verify the fundamental electrical laws for the given DC/AC circuit.
CO2	Develop simulation and experimental methods to verify the various electrical theorems (Superposition, Thevenin, Norton and maximum power transfer) for the given DC/AC Circuit.
CO3	Design the transient behavior of the given RL/RC/RLC circuit using simulation and experimental methods.
CO4	Analyze frequency response of the given series RLC circuit using simulation and experimentation methods.
CO5	Analyze frequency response of the given parallel RLC circuit using simulation and experimentation methods.
CO6	Execute the performance of the given three-phase circuit using simulation and experimental methods.

GE3272 COMMUNICATION LABORATORY

Students will be able to

CO1	Speak effectively in group discussions held in formal/semi formal contexts.
CO2	Discuss, analyse and present concepts and problems from various perspectives to arrive at suitable solutions.
CO3	Write emails, letters and effective job applications.
CO4	Write critical reports to convey data and information with clarity and precision.
CO5	Give appropriate instructions and recommendations for safe execution of tasks.
CO6	Discuss the safety issues about electrical devices.

III SEMESTER

MA3303 PROBABILITY AND COMPLEX FUNCTIONS

Students will be able to

CO1	Acquire the required skill to apply the statistical tools in engineering problems.
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COURSE OUTCOMES (CO)

CO2	Demonstrates the basic concepts of probability and random variables.
CO3	Explain the basic concepts of two dimensional random variables.
CO4	Develop an understanding of the standard techniques of complex variable theory in particular analytic function and its mapping property.
CO5	Comprehend the complex integration techniques and contour integration techniques which can be used in real integrals.
CO6	Acquaint with the Differential Equations which are significantly used in engineering problems.

EE3301 ELECTROMAGNETIC FIELDS

Students will be able to

CO1	Discuss the basic mathematical concepts related to Gradient, Divergence, and Curl operations on electromagnetic vector fields.
CO2	Identify the electromagnetic sources and their effects.
CO3	Compute and analyze electrostatic fields, electric potential, energy density along with their applications.
CO4	Determine and examine magneto static fields, magnetic flux density, vector potential alongwith their applications.
CO5	Describe different methods of emf generation and Maxwell's equations.
CO6	Explain the concept of electromagnetic waves and characterizing parameters.

EE3302 DIGITAL LOGIC CIRCUITS

Students will be able to

CO1	Acquire the fundamentals of combinational and sequential digital circuits.
CO2	Comprehend various number systems and to simplify the mathematical expressions using Boolean functions word problems.
CO3	Implement the combinational circuits using Gates` and MSI Devices
CO4	Design the various synchronous circuits using Flip Flops.
CO5	Device the asynchronous sequential circuits and programmable logic devices.
CO6	Compute digital simulation techniques for development of application oriented logic circuit.

EC3301 ELECTRON DEVICES AND CIRCUITS

Students will be able to

CO1	Comprehend the structure of basic electronic devices.
CO2	Explain about the active and passive circuit elements.
CO3	Describe the operation and applications of transistor like BJT and FET.
CO4	Illustrate the characteristics of amplifier gain and frequency response.
CO5	Explain the characteristics of MOS based cascade and differential amplifier.
CO6	Demonstrate the required functionality of positive and negative feedback systems.

EE3303 ELECTRICAL MACHINES-I

Students will be able to

CO1	Apply the laws governing the electromechanical energy conversion for singly and multiple excited systems.
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COURSE OUTCOMES (CO)

CO2	Explain the construction and working principle of DC machines.
CO3	Interpret various characteristics of DC machines.
CO4	Compute various performance parameters of the machine, by conducting suitable tests.
CO5	Draw the equivalent circuit of transformer and predetermine the efficiency and regulation.
CO6	Describe the working principle of auto transformer, three phase transformer with different types of connections.

CS3353 C PROGRAMMING AND DATA STRUCTURES

Students will be able to

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	Suggest and use appropriate linear/non-linear data structure operations for solving a given problem.
CO5	Appropriately use sort and search algorithms for a given application.
CO6	Apply appropriate hash functions that result in a collision free scenario for data storage and retrieval.

EC3311 ELECTRON DEVICES AND CIRCUITS LABORATORY

Students will be able to

CO1	Analyze the characteristics of PN, Zener diode and BJT in CE,CC,CB configurations Experimentally.
CO2	Examine the characteristics of JFET and UJT experimentally.
CO3	Demonstrate frequency response characteristics of a Common Emitter amplifier Experimentally.
CO4	Discover the characteristics of RC phase shift and LC oscillators experimentally.
CO5	Calculate the frequency and phase angle using CRO experimentally
CO6	Analyze the frequency response characteristics of passive filters experimentally.

EE3311 ELECTRICAL MACHINES-I LABORATORY

Students will be able to

CO1	Construct the circuit with appropriate connections for the given DC machine/transformer.
CO2	Experimentally determine the characteristics of different types of DC machines.
CO3	Demonstrate the speed control techniques for a DC motor for industrial applications.
CO4	Identify suitable methods for testing of transformer and DC machines.
CO5	Predetermine the performance parameters of transformers and DC motor.
CO6	Understand DC motor starters and 3-phase transformer connections.

CS3362 C PROGRAMMING AND DATA STRUCTURES LABORATORY

Students will be able to

CO1	Use different constructs of C and develop applications.
CO2	Write functions to implement linear and non-linear data structure operations



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COURSE OUTCOMES (CO)

CO3	Suggest and 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 algorithms for a given application
CO6	Execute Searching algorithms for a given application.

GE3361 PROFESSIONAL DEVELOPMENT

Students will be able to

CO1	Use of MS Word to create quality documents, by structuring and organizing content for their day to day technical and academic requirements
CO2	Apply MS EXCEL to perform data operations and analytics, record, retrieve data as per requirements and visualize data for ease of understanding
CO3	Prepare MS EXCEL to visualize data for ease of understanding
CO4	Load MS EXCEL to visualize data for ease of understanding
CO5	Explain MS PowerPoint to create high quality academic presentations by including common tables, charts, graphs
CO6	Operate MS PowerPoint to interlinking other elements, and using media objects.

IV SEMESTER

GE3451 ENVIRONMENTAL SCIENCES AND SUSTAINABILITY

Students will be able to

CO1	Explain the importance of environment, need for public awareness and types of biodiversity
CO2	Describe about environmental pollution, environmental protection and environmental protection acts.
CO3	Summarize renewable sources of energy
CO4	Discover sustainability concept, needs and challenges
CO5	Discuss about material life cycle assessment, energy cycles and carbon cycle
CO6	Explain about Zero waste and R concept

EE3301 TRANSMISSION AND DISTRIBUTION

Students will be able to

CO1	Discuss the structure of power system, computation of transmission line parameters for different configurations.
CO2	Model the transmission lines to determine the line performance.
CO3	To Explain the impact of Ferranti effect and corona on line performance.
CO4	Carry out the Mechanical design of transmission lines, grounding and to recognize about the insulators in transmission system.
CO5	Design the underground cables and understand the performance analysis of underground cable.
CO6	Describe the modelling, performance analysis and modern trends in distribution system.



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COURSE OUTCOMES (CO)

EE3402 LINEAR INTEGRATED CIRCUITS

Students will be able to

CO1	Explain monolithic IC fabrication process.
CO2	Describe the fabrication of diodes, capacitance, resistance, FETs and PV Cell.
CO3	Analyze the characteristics and basic applications (inverting/non-inverting amplifier, summer, differentiator, integrator, V/I and I/V converter) of Op-Amp.
CO4	Explain circuit and applications of op-amp based instrumentation amplifier, log/antilog amplifier, analog multiplier /divider, active filters, comparators, waveform generators, A/D and D/A converters.
CO5	Discuss Functional blocks, characteristics and applications of Timer, PLL, analog multiplier ICs.
CO6	Interpret the applications of ICs in Instrumentation amplifier, fixed and variable voltage regulator, SMPS and function generator.

EE3403 MEASUREMENTS AND INSTRUMENTATION

Students will be able to

CO1	Explain the fundamental art of measurement in engineering.
CO2	Describe the structural elements of various instruments.
CO3	Interpret the importance of bridge circuits.
CO4	Generalize the various transducers and their characteristics by experiments.
CO5	Discuss the smart sensors.
CO6	Summarize the concept of digital instrumentation and virtual instrumentation by experiments.

EE3404 MICROPROCESSOR AND MICROCONTROLLER

Students will be able to

CO1	Write assembly language program for microprocessor and microcontroller.
CO2	Design and implement interfacing of peripheral with microprocessor and Microcontroller.
CO3	Analyze, comprehend, design and simulate microprocessor based systems used for control and monitoring.
CO4	Analyze, comprehend, design and simulate microcontroller based systems used for control and monitoring.
CO5	Describe and appreciate advanced architecture evolving microprocessor field.
CO6	Explain and appreciate advanced architecture evolving microcontroller field.

EE3405 ELECTRICAL MACHINES-II

Students will be able to

CO1	Explain the construction and working principle of Synchronous generator.
CO2	Describe the construction and working principle of Synchronous Motor.
CO3	Generalize the construction and working principle of Three Phase Induction Motor.
CO4	Acquire knowledge about the starting and speed control of induction motors.
CO5	Gain knowledge about the basic principles and working of Single phase induction Motors.



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COURSE OUTCOMES (CO)

CO6	Expand knowledge about the principles and working of Special Electrical Machines.
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EE3411 ELECTRICAL MACHINES LABORATORY-II

Students will be able to

CO1	Interpret and analyze EMF and MMF methods
CO2	Analyze the characteristics of V and Inverted V curves
CO3	Acquire hands on experience of conducting various tests on alternators and obtaining their performance indices using standard analytical as well as graphical methods. To understand the importance of Synchronous machines
CO4	Acquire hands on experience of conducting various tests on induction motors and obtaining their performance indices using standard analytical as well as graphical methods.
CO5	Explain the importance of single and three phase Induction motors
CO6	Attain knowledge on separation of losses.

EE3412 LINEAR AND DIGITAL CIRCUITS LABORATORY

Students will be able to

CO1	Explain and implement Boolean Functions.
CO2	Generalize the importance of code conversion.
CO3	Design and implement circuits with digital ICs like decoders, multiplexers, register.
CO4	Acquire knowledge on Application of Op-Amp.
CO5	Design and implement counters using analog ICs like timers and VCOs.
CO6	Develop and implement counters using digital ICs like Flip-flops and counters.