



Mar Baselios Christian College of Engineering and Technology

Kuttikanam, Peermade – 685531

SEMESTER I

COURSE OUTCOMES:

Sub Code/Name:	1. GYMAT101: MATHEMATICS FOR ELECTRICAL SCIENCE AND PHYSICAL SCIENCE - 1
CO1	Solve systems of linear equations and diagonalizable matrices.
CO2	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients
CO3	Compute Laplace transform and apply it to solve ODEs arising in engineering.
CO4	Determine the Taylor series and evaluate Fourier series expansion for different periodic functions.

Sub Code/Name:	2. GXCYT122: CHEMISTRY FOR INFORMATION SCIENCE & ELECTRICAL SCIENCE
CO1	Explain the Basic Concepts of Electrochemistry and Corrosion to explore the possible applications in various engineering fields.
CO2	Describe the use of various engineering materials in different industries.
CO3	Apply appropriate analytical techniques for the synthesis and characterization of various engineering materials.
CO4	Outline various water treatment and waste management methods

Sub Code/Name:	3. GMEST103: ENGINEERING GRAPHICS AND COMPUTER AIDED DRAWING
CO1	Understand the projection of points and lines located in different quadrants
CO2	Prepare Multi view orthographic projections of objects by visualizing them in different positions
CO3	Plot sectional views and develop surfaces of a given object
CO4	Prepare pictorial drawings using the principles of isometric projection
CO5	Sketch simple drawing using CAD tools.



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Sub Code/Name:	4. GXEST104: INTRODUCTION TO ELECTRICAL AND ELECTRONICS ENGINEERING
CO1	Apply fundamental concepts and circuit laws to solve simple DC/AC electric circuits
CO2	Classify series and parallel magnetic circuits
CO3	Analyse three phase AC systems
CO4	Describe the fundamental concepts of electronic components and devices
CO5	Outline the principles of communication systems
CO6	Identify various applications of modern electronics in the contemporary world

Sub Code/Name:	5. UCEST105: ALGORITHMIC THINKING WITH PYTHON
CO1	Utilize computing as a model for solving real-world problems.
CO2	Articulate a problem before attempting to solve it and prepare a clear and accurate model to represent the problem
CO3	Utilize effective algorithms to solve the formulated models and translate algorithms into executable programs.
CO4	Interpret the problem-solving strategies, a systematic approach to solving computational problems, and essential Python programming skills

Sub Code/Name:	6. GXESL106: BASIC ELECTRICAL AND ELECTRONICS ENGINEERING WORKSHOP
CO1	Demonstrate safety measures against electrical shocks
CO2	Familiarise with transformers, rheostats, batteries and earthing schemes
CO3	Illustrate the connection diagram and identify the suitable accessories necessary for wiring simple electric circuits
CO4	Identify various electronic components
CO5	Operate various measuring instruments
CO6	Apply the design procedure of simple electronic circuits on breadboard and PCB
CO7	Build the ability to work in a team with good interpersonal skills



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Sub Code/Name:	7. UCHUT128: LIFE SKILLS AND PROFESSIONAL COMMUNICATION
CO1	Develop the ability to know & understand oneself, show confidence in one's potential & capabilities, set goals and develop plans to accomplish tasks
CO2	Develop the ability to communicate and connect with others, participate in groups/teams, empathise, respect diversity, be responsible and understand the need to exercise emotional intelligence
CO3	Develop thinking skills, problem-solving and decision-making skills
CO4	Develop listening, reading, writing & speaking skills, ability to comprehend & successfully convey any idea, and ability to analyse, interpret & effectively summarize textual, audio & visual content
CO5	Develop the ability to create effective presentations through audio-visual mediums with the use of technology tools and initiate effective use of social media platforms & tech forums for content delivery and discussions
CO6	Initiate profile-building exercises in line with the professional requirements, and start networking with professionals/academicians



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SEMESTER II

COURSE OUTCOMES:

Sub Code/Name:	1. GYMAT201: MATHEMATICS FOR ELECTRICAL SCIENCE AND PHYSICAL SCIENCE - 2
CO1	Compute the partial and total derivatives and maxima and minima of multivariable functions and to apply in engineering problems
CO2	Understand theoretical idea of multiple integrals and to apply them to find areas and volumes of geometrical shapes.
CO3	Compute the derivatives and line integrals of vector functions and to learn their applications.
CO4	Apply the concepts of surface and volume integrals and to learn their inter-relations and applications.

Sub Code/Name:	2. GBPHT121: PHYSICS FOR ELECTRICAL SCIENCE
CO1	Explain the fundamentals of Semiconductor Physics.
CO2	Describe the behaviour of semiconductor materials in semiconductor devices.
CO3	Explain Superconductivity and basic theory of dielectrics
CO4	Apply the comprehended knowledge about laser and fiber optics in various engineering applications
CO5	Apply basic knowledge of principles and theories in physics to conduct experiments

Sub Code/Name:	3. GXEST203: FOUNDATIONS OF COMPUTING: FROM HARDWARE ESSENTIALS TO WEB DESIGN
CO1	Identify the fundamental components and the working of an IT environment.
CO2	Explain the data representations, CPU architectures, and the basic functioning of a computer.
CO3	Explain the operating systems, computer network architecture, and necessary protocols used.
CO4	Develop simple interactive web pages and validate the inputs.



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Sub Code/Name:	4. GBEST213: ENGINEERING MECHANICS
CO1	Understand the vector representation of forces and moments
CO2	Identify and describe the components of system of forces acting on the rigid body
CO3	Apply the conditions of equilibrium to different force system.
CO4	Identify appropriate principles to solve problems of mechanics.
CO5	Develop the understanding of fundamental principles of rigid body dynamics

Sub Code/Name:	5. GXEST204: PROGRAMMING IN C
CO1	Infer a computational problem and develop C programs from them using basic constructs of C language including the control statements
CO2	Develop C programs using arrays, matrices, and strings.
CO3	Utilize functions to find solution to the computational problems by dividing it into a number of modules and abstract data types.
CO4	Develop C programs using pointers for dynamic data handling
CO5	Use files in C to permanently store and manipulate data.

Sub Code/Name:	6. PCECT205: NETWORK THEORY
CO1	Analyse electrical networks using mesh and node methods
CO2	Apply network theorems to analyse electrical networks
CO3	Analyse transient behaviour of electrical networks using Laplace transforms
CO4	Identify the network functions and parameters of single-port and two port networks



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Sub Code/Name:	7. GXESL208: IT WORKSHOP
CO1	Experiment with the fundamental hardware components of a computer and how to interface them with software systems
CO2	Make use of the command line of Linux operating system and shell programming.
CO3	Experiment with the data network communication scenarios using Wireshark.
CO4	Develop basic websites using HTML, CSS & JavaScript and manage the versions.



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SEMESTER III

COURSE OUTCOMES:

Sub Code/Name:	1. GYMAT301: MATHEMATICS FOR ELECTRICAL SCIENCE AND PHYSICAL SCIENCE – 3
CO1	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering
CO2	Understand the analyticity of complex functions and apply it in conformal mapping
CO3	Compute complex integrals using Cauchy's integral theorem and Cauchy's integral formula.
CO4	Understand the series expansion of complex function about a singularity and apply residue theorem to compute real integrals.

Sub Code/Name:	2. PCECT302: SOLID STATE DEVICES
CO1	Apply Fermi-Dirac statistics to compare equilibrium carrier concentration.
CO2	State different carrier transport mechanisms in extrinsic semiconductors and obtain the current densities due to this transport.
CO3	Apply the concept of semiconductor physics to solve the current components in semiconductor devices.
CO4	Analyse the response of semiconductor devices for different biasing conditions
CO5	Outline the effects of scaling in semiconductor devices

Sub Code/Name:	2. PCECT303: ANALOG CIRCUITS
CO1	Design wave shaping circuits using first order RC network and diodes.
CO2	Analyse single stage and multistage BJT amplifier circuits using equivalent models.
CO3	Apply the principles of feedback in the design of oscillators.
CO4	Design power amplifiers and voltage regulator circuits.



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Sub Code/Name:	3. PBECT304: LOGIC CIRCUIT DESIGN
CO1	Apply the knowledge of digital representation of information and Boolean algebra to deduce optimal digital circuits.
CO2	Design and implement combinational logic circuits, sequential logic circuits and finite state machines
CO3	Design and implement digital circuits on FPGA using hardware description language (HDL).
CO4	Outline the performance of logic families with Respect to different parameters.

Sub Code/Name:	4. GNEST305: INTRODUCTION TO ARTIFICIAL INTELLIGENCE AND DATA SCIENCE
CO1	Apply the concept of machine learning algorithms including neural networks and supervised/unsupervised learning techniques for engineering applications.
CO2	Apply advanced mathematical concepts such as matrix operations, singular values, and principal component analysis to analyse and solve engineering problems
CO3	Analyse and interpret data using statistical methods including descriptive statistics, correlation, and regression analysis to derive meaningful insights and make informed decisions.
CO4	Integrate statistical approaches and machine learning techniques to ensure practically feasible solutions in engineering contexts.

Sub Code/Name:	5. UCHUT347: ENGINEERING ETHICS AND SUSTAINABLE DEVELOPMENT
CO1	Develop the ability to apply the principles of engineering ethics in their professional life
CO2	Develop the ability to exercise gender-sensitive practices in their professional lives
CO3	Develop the ability to explore contemporary environmental issues and sustainable practices.
CO4	Develop the ability to analyse the role of engineers in promoting sustainability and climate resilience.
CO5	Develop interest and skills in addressing pertinent environmental and sustainable practices.



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Sub Code/Name:	6. PCECL307: ANALOG CIRCUITS LAB
CO1	Design and demonstrate the functioning of basic analog circuits using discrete components.
CO2	Design and simulate the functioning of basic analog circuits using simulation tools
CO3	Conduct troubleshooting of a given circuit and to analyse it

Sub Code/Name:	7. PCECL308: LOGIC CIRCUIT DESIGN LABORATORY
CO1	Design and demonstrate the functioning of various combinational and sequential circuits using ICs
CO2	Apply an industry compatible hardware description language to implement digital circuits
CO3	Implement digital circuits on FPGA boards and connect external hardware to the boards
CO4	Function effectively as an individual and in a team to accomplish the given task.



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SEMESTER 4

Sub Code/Name:	GBMAT401: MATHEMATICS FOR ELECTRICAL SCIENCE – 4
CO1	Illustrate the concept, properties and important models of discrete random variables and to apply in suitable random phenomena.
CO2	Describe the concept, properties and important models of continuous random variables and to apply in suitable random phenomena.
CO3	Estimate population parameters, assess their certainty with confidence intervals, and test hypotheses about population means and proportions using z-tests and the one-sample t-test.
CO4	Analyze random processes by classifying them, describing their properties, utilizing autocorrelation functions, and understanding their applications in areas like signal processing and communication systems.

Sub Code/Name:	PCECT402 :SIGNALS AND SYSTEMS
CO1	Classify continuous and discrete time signals and systems based on their properties and perform basic operations on signals.
CO2	Determine the stability and causality of LTI systems using convolution operations.
CO3	Analyze signals in frequency domain using various transforms and examine their properties.
CO4	Interpret the use of various transforms to analyze continuous and discrete time LTI systems.

Sub Code/Name:	PCECT403 :LINEAR INTEGRATED CIRCUITS
CO1	Summarize the concepts of operational amplifiers and differential amplifier configurations
CO2	Design operational amplifier circuits for various applications.
CO3	Choose integrated circuit chips for various linear circuit applications.
CO4	Implement various applications using specific integrated circuit chips

Sub Code/Name:	PBECT404:MICROCONTROLLERS
CO1	Outline Architecture of Microcontroller
CO2	Develop Microcontroller programs
CO3	Design various interfaces to Microcontroller
CO4	Design and implement an Embedded System



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Sub Code/Name:	PEECT 411: INSTRUMENTATION
CO1	Interpret the basic concepts of measuring instruments, its classification, and selection criteria.
CO2	Outline the principle, construction and working of transducers for measuring physical variables.
CO3	Comprehend the principle, construction and working of various electronic measuring instruments.
CO4	Apply PLC programming for selected industrial processes.

Sub Code/Name:	PCECL407:LINEAR INTEGRATED CIRCUITS LAB
CO1	Design and implement basic linear integrated circuits using Op Amps.
CO2	Design and implement basic linear integrated circuits using linear ICs.
CO3	Design and simulate the functioning of basic linear integrated circuits and linear ICs. using simulation tools.
CO4	Effectively troubleshoot a given circuit and analyze it

Sub Code/Name:	PCECL408: MICROCONTROLLER LAB
CO1	Develop 8051 Microcontroller programs
CO2	Design and implement various interfaces to the 8051 Microcontroller
CO3	Design and implement an Embedded System using a 8051 microcontroller
CO4	Design and implement an Embedded System using an ARM processor