MAR BASELIOS CHRISTIAN COLLEGE OF ENGINEERING,PEERMADE				
DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING				
Course Outcome- KTU(2019 Scheme)				
	Course Co	**Course**	**Course Outcomes**	
S1 & S2	EST120	Basics of civil and mechanical engineering	CO1	Recall the role of civil engineer in society and to relate the various disciplines of Civil Engineering.
			CO2	Explain different types of buildings, building components, building materials and building construction
			CO3	Describe the importance, objectives and principles of surveying.
			CO4	Summarise the basic infrastructure services MEP, HVAC, elevators, escalators and ramps
			CO5	Discuss the Materials, energy systems, water management and environment for green buildings.
			CO6	Analyse thermodynamic cycles and calculate its efficiency
			CO7	Illustrate the working and features of IC Engines
			CO8	Explain the basic principles of Refrigeration and Air Conditioning
			CO9	Describe the working of hydraulic machines
			CO10	Explain the working of power transmission elements
			CO11	Describe the basic manufacturing, metal joining and machining processes
	EST130	Basics of Electrical and Electronics	CO1	Apply fundamental concepts and circuit laws to solve simple DC electric circuits
			CO2	Develop and solve models of magnetic circuits
			CO3	Apply the fundamental laws of electrical engineering to solve simple ac circuits in steady state
			CO4	Describe working of a voltage amplifier
			CO5	Outline the principle of an electronic instrumentation system
			CO6	Explain the principle of radio and cellular communication
	CYT100	Engineering Chemistry	CO1	Apply the basic concepts of electrochemistry and corrosion to explore its possible applications in various engineering fields.
			CO2	Understand various spectroscopic techniques like UV-Visible, IR, NMR and its applications.
			CO3	Apply the knowledge of analytical method for characterizing a chemical mixture or a compound. Understand the basic concept of SEM for surface characterisation of nanomaterials.
			CO4	Learn about the basics of stereochemistry and its application. Apply the knowledge of conducting polymers and advanced polymers in engineering.
			CO5	Study various types of water treatment methods to develop skills for treating wastewater.
	EST100	Engineering Mechanics	CO1	Recall principles and theorems related to rigid body mechanics
			CO2	Identify and describe the components of system of forces acting on the rigid body
			CO3	Apply the conditions of equilibrium to various practical problems involving different force system.
			CO4	Choose appropriate theorems, principles or formulae to solve problems of mechanics.
			CO5	Solve problems involving rigid bodies, applying the properties of distributed areas and masses
	EST110	Engineering Graphics	CO1	Able to prepare the orthographic projections of points and straight lines placed in various quadrant
			CO2	Prepare multiview orthographic projections of objects by visualizing them in different positions
			CO3	Draw sectional views and develop surfaces of a given object
			CO4	Prepare pictorial drawings using the principles of isometric and perspective projections to visualize objects in three dimensions.
			CO5	Convert 3D views to orthographic views
			CO6	Obtain multiview projections and solid models of objects using CAD tools
	HUN102	Professional Communications	CO1	Develop vocabulary and language skills relevant to engineering as a profession
			CO2	Analyze, interpret and effectively summarize a variety of textual content
			CO3	Create effective technical presentations
			CO4	Discuss a given technical/non-technical topic in a group setting and arrive at generalizations/consensus
			CO5	Identify drawbacks in listening patterns and apply listening techniques for specific needs
			CO6	Create professional and technical documents that are clear and adhering to all the necessary conventions

	HUN101	Life Skills	CO1	Define and Identify different life skills required in personal and professional life
			CO2	Develop an awareness of the self and apply well-defined techniques to cope with emotions and stress.
			CO3	Explain the basic mechanics of effective communication and demonstrate these through presentations.
			CO4	Take part in group discussions
			CO5	Use appropriate thinking and problem solving techniques to solve new problems
			CO6	Understand the basics of teamwork and leadership
	MAT102	VECTOR CALCULUS, DIFFERENTIAL EQUATIONS AND TRANSFORMS	CO1	Compute the derivatives and line integrals of vector functions and learn their applications
			CO2	Evaluate surface and volume integrals and learn their inter-relations and applications.
			CO3	Solve homogeneous and non-homogeneous linear differential equation with constant coefficients
			CO4	Compute Laplace transform and apply them to solve ODEs arising in engineering
			CO5	Determine the Fourier transforms of functions and apply them to solve problems arising in engineering
	CE100	linear Algebra & Calculas	CO1	solve systems of linear equations, diagonalize matrices and characterise quadratic forms
			CO2	compute the partial and total derivatives and maxima and minima of multivariable functions
			CO3	compute multiple integrals and apply them to find areas and volumes of geometrical shapes, mass and centre of gravity of plane laminas
			CO4	perform various tests to determine whether a given series is convergent, absolutely convergent or conditionally convergent
			CO5	determine the Taylor and Fourier series expansion of functions and learn their applications
	EST102	Programming in C	C01	Analyze a computational problem and develop an algorithm/flowchart to find its solution
			CO2	Develop readable* C programs with branching and looping statements, which uses Arithmetic, Logical, Relational or Bitwise operators.
			C03	Write readable C programs with arrays, structure or union for storing the data to be processed
			C04	Divide a given computational problem into a number of modules and develop a readable multi-function C program by using recursion if required, to find the solution to the computational problem
			CO5	Write readable C programs which use pointers for array processing and parameter passing
			C06	Develop readable C programs with files for reading input and storing output
	PHL120	Engineering Physics Lab	CO1	Develop analytical/experimental skills and impart prerequisite hands on experience for engineering laboratories
			CO2	Understand the need for precise measurement practices for data recording
			CO3	Understand the principle, concept, working and applications of relevant technologies and comparison of results with theoretical calculations
			CO4	Analyze the techniques and skills associated with modern scientific tools such as lasers and fiber optics
			CO5	Develop basic communication skills through working in groups in performing the laboratory experiments and by interpreting the results
	CYL 120	Engineering Chemistry Lab	CO1	Understand and practice different techniques of quantitative chemical analysis to generate experimental skills and apply these skills to various analyses
			CO2	Develop skills relevant to synthesize organic polymers and acquire the practical skill to use TLC for the identification of drugs
			CO3	Develop the ability to understand and explain the use of modern spectroscopic techniques for analysing and interpreting the IR spectra and NMR spectra of some organic compounds
			CO4	Acquire the ability to understand, explain and use instrumental techniques for chemical analysis
			CO5	Learn to design and carry out scientific experiments as well as accurately record and analyze the results of such experiments
			CO6	Function as a member of a team, communicate effectively and engage in further learning. Also understand how chemistry addresses social, economical and environmental problems and why it is an integral part of curriculum
	ESL120		CO1	Name different devices and tools used for civil engineering measurements
			CO2	Explain the use of various tools and devices for various field measurements
			CO3	Demonstrate the steps involved in basic civil engineering activities like plot measurement, setting out operation, evaluating the natural profile of land, plumbing and undertaking simple construction work.

		Civil and Mechanical Engineering Workshop	CO4	Choose materials and methods required for basic civil engineering activities like field measurements, masonry work and plumbing.
			CO5	Compare different techniques and devices used in civil engineering measurements
			CO6	Identify Basic Mechanical workshop operations in accordance with the material and objects
			CO7	Apply appropriate Tools and Instruments with respect to the mechanical workshop trades
			CO8	Apply appropriate safety measures with respect to the mechanical workshop trades
	ESL130	Electrical Electronics Workshop	CO1	Demonstrate safety measures against electric shocks.
			CO2	Identify the tools used for electrical wiring, electrical accessories, wires, cables, batteries and standard symbols
			CO3	Develop the connection diagram, identify the suitable accessories and materials necessary for wiring simple lighting circuits for domestic buildings
			CO4	Identify and test various electronic components
			CO5	Draw circuit schematics with EDA tools
			CO6	Assemble and test electronic circuits on boards
			CO7	Work in a team with good interpersonal skills
S3	MAT101	Linear Algebra & Calculas Analysis	CO1	At the end of the course students will be able to solve any given system of linear equations.
			CO2	Find the eigen values of a matrix and how to diagonalise a matrix.
			CO3	Identify analytic functions and harmonic functions.
			CO4	Evaluate real definite integrals as application of residue theorem.
			CO5	Identify conformal mappings
			CO6	Find regions that are mapped under certain transformation.
	ECT205	Network Theory	CO1	Apply Mesh / Node analysis or Network Theorems to obtain steady state response of the linear time invariant networks.
			CO2	Apply Laplace Transforms to determine the transient behaviour of RLC networks.
			CO3	Apply Network functions and Network Parameters to analyse the single port and two port networks.
	ECT201	Solid State Devices	CO1	Apply Fermi-Dirac Distribution function and Compute carrier concentration at equilibrium and the parameters associated with generation, recombination and transport mechanism
			CO2	Explain drift and diffusion currents in extrinsic semiconductors and Compute current density due to these effects.
			CO3	Define the current components and derive the current equation in a pn junction diode and bipolar junction transistor.
			CO4	Explain the basic MOS physics and derive the expressions for drain current in linear and saturation regions.
			CO5	Discuss scaling of MOSFETs and short channel effects.
	EC205	Electronics Circuits	CO1	To develop the skill of analysis and design of various analog circuits using discrete electronic devices as per the specifications.
	ECT203	Logic Circuits Design	CO1	Explain the elements of digital system abstractions such as digital representations of information, digital logic and Boolean algebra
			CO2	Create an implementation of a combinational logic function described by a truth table using and/or/inv gates/ muxes
			CO3	Compare different types of logic families with respect to performance and efficiency
			CO4	Design a sequential logic circuit using the basic building blocks like flip-flops
			CO5	Design and analyze combinational and sequential logic circuits through gate level Verilog models.
	ECL203	Logic design Lab	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 circuis 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
	ECT281	Electronics Circuits(Minor)	CO1	Realize simple circuits using diodes, resistors and capacitors
			CO2	Design amplifier and oscillator circuits
			CO3	Design Power supplies, D/A and A/D convertors for various applications
			CO4	Design and analyze circuits using operational amplifiers
	ECT283	Analog Communication(Minor)	CO1	Explain various components of a communication system
			CO2	Discuss various sources of noise, and its the effect in a communication system
			CO3	Explain amplitude modulation and its variants for a sinusoidal message

			CO4	Explain frequency modulation and its variants for a sinusoidal message
			CO5	List and compare various transmitter and receiver systems of AM and FM
	ECT285	Introduction to signals and systems	CO1	Define and classify continuous and discrete signals
			CO2	Explain and characterize a system and LTI system
			CO3	Explain the spectrum of a signal
S4	MA202	Probability Distributions, Transforms and Numerical Methods	CO1	Acquire the concept of random variable ,discrete probability distributions with practical applications in various engineering and social life situation
			CO2	Acquire the concept of continuous probability distributions with practical applications in various engineering and social life situation.
			CO3	Understand Fourier transforms which has wide applications in all engineering courses.
			CO4	Understand Laplace transforms which has wide applications in all engineering courses
			CO5	Solve various engineering problems using interpolation and iteration.
			CO6	Solve various engineering problems using numeric integration
	ECT202	Analog Circuits	CO1	Design analog signal processing circuits using diodes and first order RC circuit
			CO2	Analyse basic amplifiers using BJT and MOSFET
			CO3	Apply the principle of oscillator and regulated power supply circuits.
	ECT204	Signals and Systems	CO1	Apply properties of signals and systems to classify them
			CO2	Represent signals with the help of series and transforms
			CO3	Describe orthogonality of signals and convolution integral.
			CO4	Apply transfer function to compute the LTI response to input signals.
			CO5	Apply sampling theorem to discretize continuous time signals
	ECT206	Computer Architecture &Microcontrollers	CO1	Explain the functional units, I/O and memory management w.r.t a typical computer architecture
			CO2	Distinguish between microprocessor and microcontroller
			CO3	Develop simple programs using assembly language programming
			CO4	Interface 8051 microcontroller with peripheral devices using ALP/Embedded C
			CO5	Familiarize system software and Advanced RISC Machine Architecture.
	ECT208	Analog Communication Engineering	CO1	To study the concepts and types of modulation schemes.
			CO2	To study different types of radio transmitters and receivers.
			CO3	Develop queries for relational database in the context of practical applications
			CO4	To study the effects of noise in analog communication systems.
			CO5	To impart basic knowledge on public telephone systems.
	ECL202	Analog Circuit& simulation 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	Function effectively as an individual and in a team to accomplish the given task.
	ECL204	Microcontroller Lab	CO1	Write an Assembly language program/Embedded C program for performing data manipulation.
			CO2	Develop ALP/Embedded C Programs to interface microcontroller with peripherals
			CO3	Perform programming/interfacing experiments with IDE for modern microcontrollers.
	ECT292	Nanoelctronics(minor)	CO1	Learn the new trends in microelectronics and nanoelectronics.
			CO2	Explain the various methods of fabrication of nano-layers and nano particle.
			CO3	Learn the characterization of nanostructures and the tools used for this.
			CO4	Recognize two dimensional behavior of electronic system.
			CO5	Explicate transport of charge in nanostructures.
	ECT294	Stochastic process for communication	CO1	Explain the concepts of probability, random variables and stochastic processes
			CO2	Apply the knowledge in probability to ststistically characterize communication channels.
			CO3	Apply probability to find the information and entropy
			CO4	Explain source coding and channel coding theorem.
			CO5	Apply stochastic processes in data transmission