MES COLLEGE ERUMELY

PO, PSO & CO

B.Sc Electronics

MES COLLEGE ERUMELY

DEPARTMENT OF ELECTRONICS

UNDERGRADUATE PROGRAMME - B.Sc

A. Programme Outcomes

PO1	Apply knowledge and skill in the design and development of Electronic Circuits to cater to the needs of Electronic industry.
PO2	Become trained in the areas of Electronics, Communication, Fiber optics etc.
PO3	Ready to pursue advanced level Electronics.

B. Programme Specific Outcomes

PSO1	To provide in depth knowledge of scientific and technological aspects of Electronics.
PSO2	To familiarize with current and recent technological developments.
PSO3	To enrich knowledge through programs such as project lab and seminars.
PSO4	To train students in skills related to electronics industry and market.
PSO5	To create foundation for research and development in Electronics.
PSO6	To develop analytical abilities towards real world problems.
PSO7	To help students build-up a progressive and successful career in Electronics.

C. Course Outcome

Semester I			
Course code	**Course Title**	**Course Outcome**	
EL1CRT01	**Basic Electronics**	CO1	Describe the behavior of semiconductor materials
		CO2	Reproduce the V-I characteristics of diode/BJT/MOSFET devices
		CO3	Apply standard device models to explain/calculate critical internal parameters of semiconductor devices
		CO4	Explain the behavior and characteristics of power devices such as SCR/UJT etc
EL1CRT02	**Methodology of Science**	CO1	Understand the history and philosophy science.
		CO2	Explain the science in middle ages
		CO3	Understand the concept of Newton and after, Newtonian synthesis
		CO4	Apply the concept of scientific reasoning, scientific explanation and experimentation.
		CO5	Understand the basic concepts of electronics and electronics communication in early days.
EL1CRP01	**Basic Electronics Lab – Practical**	CO1	To get a basic knowledge on Electronic components and their characteristics.
		CO2	Calculate various device parameters values from their V-I characteristics.
		CO3	To understand CRO and

			function generators.
PH1CMT03	**Physics-Solid State Physics**	CO1	Understand the basic crystal structure and atomic bonding.
		CO2	Explain the limitation of classical physics and basic concepts of quantum physics.
		CO3	Describe the mechanical, thermal and magnetic properties of materials.
		CO4	Understand basic semiconductors and their types.
EN1CCT01	**English-I**	CO1	Understand the basic rules in English grammar
		CO2	Understand the use of English in both written and verbal form.
		CO3	Conceive the ideas of subject-verb agreement in English
		CO4	Develop the ability to write formal and informal letters.
		CO5	Understand the importance of effective usage of English.
		CO6	Understand puns and idioms in English language.
MM1CMTO7	**Mathematics - I**	CO1	Understand the concepts of limits and calculate limits.
		CO2	Understand the idea of differentiation from first principles.
		CO3	Differentiate Trigonometric functions, parametric functions etc.
		CO4	To evaluate partial derivatives
		CO5	To understand the applications of partial differentiation.

		CO6	Understand the relationship between the derivative and the definite integral as expressed in both parts of the Fundamental Theorem of Calculus.
		CO7	Understand The concepts of definite integrals
		CO8	Understand The concepts of definite integrals
		CO9	Use different methods of integration
		CO10	Understand Some applications of integral calculus
Semester II			
EL2CRT03	**Electronic Circuits**	CO1	Illustrate about rectifiers, transistor and FET amplifiers and its biasing. Also compare the performances of its low frequency models.
		CO2	Describe the frequency response of MOSFET and BJT amplifiers.
		CO3	Explain the concepts of feedback and construct feedback amplifiers and oscillators.
		CO4	Summarizes the performance parameters of amplifiers with and without feedback
EL2CRT04	**Network Theory**	CO1	Study circuits in a systematic manner suitable for analysis and design.
		CO2	Understands how to formulate circuit analysis problems in a mathematically tractable way

		CO3	Analyze the electric circuit using network theorems.
		CO4	Determine Sinusoidal steady state & transient response.
		CO5	Understand the two–port network parameters and the relationship between them
		CO6	Understand different types of filters and derive the equations of characteristic impedance and propagation constant
		CO7	Understand the concept of network functions
		CO8	Analyse the time domain behavior of network functions from pole-zero plot
		CO9	Analyse the stability of a system using Routh-Hurwitz stability criterion.
EL2CRT05	**Digital Electronics**	CO1	Understand and represent numbers in powers of base and converting one from the other, carry out arithmetic operations.
		CO2	Understand basic logic gates, concepts of Boolean algebra and techniques to reduce/simplify Boolean expressions.
		CO3	Understand different flip flops and latches.
		CO4	Analyze and design combinatorial as well as sequential circuits.
		CO5	Design of various asynchronous and synchronous counters.
EL2CRP02	**Digital Electronics Laboratory –**	CO1	To familiarize different logic gates and its operations.
		CO2	Design various adder circuits.

	Practical	CO3	Apply the working of different code converters.
		CO4	Design shift registers and asynchronous/synchronous counters.
EN2CCT01	**English- II**	CO1	Understand the social,political and cultural context of contemporary issues
		CO2	Understand the psychological burden caused by war and its aftermath.
		CO3	Understand the values imparted through the excerpt
		CO4	Evaluate the ecological issues raised by the vulnerability and fragility of the natural resources
		CO5	Formulate clear and accurate opinions on the issues that are relevant
		CO6	Articulate these values in error free English
MM2CMT07	**Mathematics - II**	CO1	Perform common matrix operations such as addition, scalar multiplication, multiplication and transposition.
		CO2	Solve the homogeneous and non homogeneous system of equations
		CO3	Find the rank, eigenvalues and eigenvectors of a matrix.
		CO4	Provide axioms of vector space and its subspace.
		CO5	Determine the basis and dimension of finite dimensional vector space
		CO6	Solve exact , linear , first order differential equations and solution

			by substitution.
		CO7	Formation of first and second order partial differential equations.
		CO8	Solve the linear partial differential equations of first order.
Semester III			
EL3CRT06	**Analog Communication**	CO1	Understand different blocks in communication system and how noise affects communication using different parameters.
		CO2	Distinguish between different amplitude modulation schemes with their advantages, disadvantages and applications
		CO3	Analyze generation and detection of FM signal and comparison between amplitude and angle modulation schemes.
		CO4	Identify different radio receiver circuits.
		CO5	Differentiate between different pulse modulation and demodulation techniques and signal multiplexing for various applications
EL3CRT07	**Analog ICs and Applications**	CO1	Understand basics of IC and IC technology.
		CO2	Infer the operational amplifiers and its various features and parameters.
		CO3	Elucidate and design the linear and non linear

			applications of an op-amp.
		CO4	Explain various op amp circuits and oscillators.
		CO5	Explain and compare the working of multi vibrators using special application IC 555.
EL3CRT08	**Electromagnetic Theory**	CO1	Understand the fundamentals of Electrostatics and Magnetostatics hence get the insight of the characteristics of materials and their interactions with electric and magnetic fields
		CO2	Understand the application of Vector Differential and Integral operators in Electromagnetic Theory.
		CO3	Interpret Maxwell's equations in differential and integral forms, both in time and frequency domains.
		CO4	Describe radiation mechanism and antennas.
EL3CRT09	**8085 Microprocessor**	CO1	Draw and describe architecture of 8085
		CO2	Interface various peripheral devices to the microcontrollers
		CO3	Explain the instructions and external ports of 8085
		CO4	Write assembly language program for microcontrollers.
		CO5	Design microcontroller based system for various applications

EL3CRP03	**Analog Electronics Circuits Lab – Practical**	CO1	Analyze the working of various rectifiers and regulator circuits
		CO2	Design oscillator circuits and clipping/clamping circuits.
		CO3	Expertise op-amp and op-amp circuits.
		CO4	Analyze various filter characteristics.
		CO5	Design circuits using 555 timer IC.
ST3CMT01	**Probability and Statistics**	CO1	Understand the definitions and basic terminology of Statistics.
		CO2	Classify the data using diagrams and graphs .
		CO3	Evaluate Measures of central tendency, measures of dispersion and moments
		CO4	Evaluate probability using Addition, Multiplication and Bayes theorems of Probability
		CO5	Use probability distributions to solve statistical problems.
		CO6	Understand the standard normal curves.
		CO7	Evaluate appropriate areas under standard normal curves.
		CO8	Describe hypothesis testing in general and Conduct hypothesis tests for population mean and population proportion.
		CO9	Use Chi-square test for testing Goodness of fit .

		CO10	Understand the concepts of correlation and regression and evaluate the value of correlation coefficients values
		CO11	Understand the concepts of regression and find regression equations
Semester IV			
EL4CRT10	**Programming in C**	CO1	Write code in C language for arithmetic and logical problems.
		CO2	Implement conditional branching, iteration and recursion.
		CO3	Use concept of modular programming by writing functions and using them to form a complete program
		CO4	Understand the concept of arrays, pointers and structures and use them to develop algorithms and programs for implementing searching and sorting
EL4CRT11	**Microwave Electronics**	CO1	Understand microwave range of communication.
		CO2	Understand transmission lines and its divisions.
		CO3	Understand various parameters of waveguide and use of component as per applications.
		CO4	Analyze different microwave components and their working.
		CO5	Able to analyze and find applications and limitations of microwave tube Generators and Amplifiers.

EL4CRT12	**Digital Communication**	CO1	Understand the basics of information theory, source coding techniques and calculate Entropy of source.
		CO2	Learn the generation of pulse code modulation and sampling theorem.
		CO3	Describe and determine various digital band pass modulation techniques.
		CO4	Understand various spread spectrum modulation techniques.
		CO5	Analyze the mobile computing architecture.
EL4CRT13	**Instrumentation Electronics**	CO1	Understand different transducers and their characteristics.
		CO2	Describe the working principle of different measuring instruments.
		CO3	Analyze the working of multimeters and CROs.
		CO4	Describe the measuring instruments used in medical instruments.
EL4CRP04	**Programming in C Lab– Practical**	CO1	Implement conditional branching, iteration and recursion.
		CO2	Write Programs in C for arithmetic and logical operations.
		CO3	Prepare the technical report on the experiments carried.
EL4CRT05	**Microprocessor Lab – Practical**	CO1	Understand the programming knowledge of 8085 microprocessor.
		CO2	Understand the interfacing techniques used in 8085

			microprocessor.
		CO3	Apply various assembly level programming for various arithmetic operations.
Semester V			
EL5CRT14	**Microcontrollers and Applications**	CO1	Draw and describe architecture of 8051.
		CO2	Interface various peripheral devices to the microcontrollers.
		CO3	Write assembly language program for microcontrollers.
		CO4	Design microcontroller based system for various applications.
EL5CRT15	**Environmental Awareness and Human Rights**	CO1	Environmental Education encourages students to research, investigate how and why things happen, and make their own decisions about complex environmental issues by developing and enhancing critical and creative thinking skills. It helps to foster a new generation of informed consumers, workers, as well as policy or decision makers.
		CO2	Environmental Education helps students to understand how their decisions and actions affect the environment, builds knowledge and skills necessary to address

			complex environmental issues, as well as ways we can take action to keep our environment healthy and sustainable for the future. It encourages character building, and develop positive attitudes and values.
		CO3	Develop the sense of awareness among the students about the environment and its various problems and to help the students in realizing the inter-relationship between man and environment and helps to protect the nature and natural resources.
		CO4	Help the students in acquiring the basic knowledge about environment and the social norms that provide unity with environmental characteristics and create positive attitude about the environment.
		CO5	Impart awareness on, Human rights and E-waste management
EL5CRT16	**Computer Hardware**	CO1	Understand basic system components and concept of computer hardware.
		CO2	Understand the various peripheral systems.
		CO3	Describe BIOS and memory used in PC.

		CO4	Understand different interfacing done in PC.
		CO5	Analyze various communication protocols.
EL5CRP06	**Microcontroller Lab – Practical**	CO1	Understand assembly level programming language.
		CO2	Implement various arithmetic operations in microcontroller.
		CO3	Analyze working of external circuits using microcontroller peripherals.
EL5CRP07	**Communication Lab – Practical**	CO1	Understand basic elements of a communication system.
		CO2	Analyze the baseband signals in time domain and in frequency domain.
		CO3	Build understanding of various analog and digital modulation and demodulation techniques.
		CO4	Prepare the technical report on the experiments carried.
EL5CBT01	**Open Course – Electronic Communication**	CO1	Understand the basics of electronic communication.
		CO2	Understand different modulation techniques.
		CO3	Describe different multiplexing methods.
		CO4	Understand digital communication basics.
		CO5	Describe various modems and its functions.
EL5CBT01	**Computer Assembling**	CO1	Understand history of computer hardware and various peripherals.
		CO2	Understand generation and specifications of microprocessors.

		CO3	Describe BIOS and its working.
		CO4	Understand motherboard form factors and architecture concept.
		CO5	Describe different memory types and its interfaces.
		CO6	Understand the basic concept of OS.
Semester VI			
EL6CRT17	**Optoelectronics**	CO1	Understand fundamental principles of optics and light.
		CO2	Analyze various LASERS and LEDs used in optoelectronics.
		CO3	Analyze different photo detectors.
		CO4	Describe optical fibers and its parameters.
		CO5	Understand semiconductors and modulators in optoelectronics.
EL6CRT18	**Computer Networks**	CO1	Understand the fundamentals of computer networks and issues involved.
		CO2	Understand various reference models used in data communication.
		CO3	Describe physical layer and data link layer in communication.
		CO4	Analyze the various error detection and correction methods.
		CO5	Describe application layer protocols and IP formats.

EL6CRT19	**Digital Signal Processing**	CO1	Understand about various types of signals and systems, classify them, analyze them, and perform various operations on them.
		CO2	Understand use of transforms in analysis of signals and systems in continuous and discrete time domain.
		CO3	Design of digital filters from analog filters.
		CO4	Understand different types of digital signal processors and its architecture.
EL6CBT01	**Mobile Communication**	CO1	Understand the basic concept in mobile communication.
		CO2	Discuss various mobility management techniques.
		CO3	Understand the concept of GSM and its signaling schemes.
		CO4	Describe WAP protocol and its application.
		CO5	Explain the concepts of 3G service, Bluetooth and WLL technologies.