



MES COLLEGE ERUMELY

PO, PSO, CO



M. Sc Electronics

MES COLLEGE ERUMELY

DEPARTMENT OF ELECTRONICS

POSTGRADUATE PROGRAMME

M.Sc Electronics programme

M.Sc Electronics is a 2-years postgraduate program in the stream of Electronics. The course is designed to help students build in problem solving abilities, expertise in designing and operation of electronic systems.

A. Programme Outcomes

PO1	Impart the basic and up-to-date knowledge in electronics with sufficient practical sessions
PO2	To be specific, subject areas like digital signal processing, embedded Electronics, Control system, digital Design, artificial Intelligence, deep Learning, Optical Communication techniques etc are discussed with adequate knowledge which will help to develop the system
PO3	To have practical knowledge in these subjects

B. Programme Specific Outcomes

PSO1	Prepare students to pursue research in Electromagnetics, signal Processing, Image Processing, artificial Intelligence and ANN, Robotics.
PSO2	To develop an ability to apply knowledge in design and development of various Electronic/Electrical System.
PSO3	To become an entrepreneur in embedded based systems, digital and analog system design
PSO4	To provide in depth concept of IC technology and VLSI design together with Hardware Descriptor Language and Nanoelectronics.
PSO5	To develop multi-skilled engineers who are able to spearhead the progress of the nation in the information age.

C. Course Outcomes

Semester I			
Course code	Course Title	Course Outcome	
EL010101	Network Analysis and Synthesis	CO1	To develop knowledge of basic circuit law and simplify the network using reduction techniques
		CO2	Analyze the circuit using Kirchhoff's law and Network theorems
		CO3	To get thorough Knowledge of basic circuit laws, Laplace and fourier transforms and its applications
		CO4	Infer and evaluate transient response, Steady state response, network functions using transformation techniques.
		CO5	To understand general properties of signals and systems
		CO6	To analyse and synthesis passive networks
EL010102	Electronic Circuits Analysis	CO1	Review of basic concepts of semiconductor physics and devices.
		CO2	Analyze the characteristics of various electronic devices like diode, transistor etc., and able to classify and analyze the various circuit configurations of Transistor and MOSFETs.
		CO3	To study the characteristics and analysis of active electronic devices
		CO4	To familiarize the operational amplifiers and its applications
		CO5	To know the design of various applications of analog IC's
		CO6	To understand the various power electronic devices and its applications
EL010103	IC Fabrication and MEMS	CO1	To study the IC fabrication techniques
		CO2	To familiarize the MEMS technology, fabrication and applications
EL010104	Digital Communication Techniques	CO1	To understand information theory and coding
		CO2	Knowledge of statistical theory of communication and explain the conventional

			digital communication system.
		CO3	Apply the knowledge of signals and system and evaluate the performance of digital communication system in the presence of noise.
		CO4	To familiarize various coding techniques and methods
		CO5	To understand convolutional codes and cryptography
		CO6	To get the knowledge on digital modulation techniques and their comparison
EL010105	Advanced Electronics Circuit Lab	CO1	To familiarize the design and troubleshooting the digital circuits, analog circuits, and IC based circuits
		CO2	To get in-depth knowledge on opamp circuits and their applications
		CO3	To familiarize the power electronics based devices and their applications
		CO4	To design and set up various modulation based circuits
Semester II			
EL010201	Digital Signal Processing & Applications	CO1	Interpret, represent and process discrete/digital signal and system.
		CO2	Thorough understanding of frequency domain analysis of discrete time signals using various transformation techniques.
		CO3	To get thorough knowledge on FFT and its applications
		CO4	Implementation issues such as computational complexity, hardware resource limitations as well as cost of DSP systems or DSP Processors.
		CO5	To familiarize digital IIR and FIR filter designing and its realization
		CO6	To discuss the various applications of DSP
EL010202	AVR based Embedded Systems	CO1	To give an in-depth knowledge on AVR microcontroller
		CO2	To get a thorough knowledge on AVR assembly language programming
		CO3	To familiarize the interfacing of AVR and its

			applications
EL010203	Mobile Computing	CO1	To introduce mobile computing technology
		CO2	To know the various emerging technologies in mobile communications
		CO3	To familiarize the various mobile communication standards and applications
EL010204	VLSI Design and Analysis	CO1	To get thorough knowledge on MOS technology
		CO2	Understand the steps of IC fabrication, Crystal Growth and Wafer Preparation.
		CO3	Study the Epitaxy, Diffusion, Oxidation, Lithography, Etching and metallization.
		CO4	To familiarize the basic IC fabrication process
		CO5	Describe the techniques used the design of CMOS logic circuits, switches and memory in VLSI.
		CO6	To discuss the various MOS circuit design process and FPGA
EL010205	Microcontrollers and DSP Lab	CO1	To familiarize the AVR microcontroller programming methods
		CO2	To study how to interface AVR with various peripherals and controlling devices
		CO3	To familiarize MATLAB programming and its applications in DSP
Semester III			
EL010301	Digital System Design	CO1	To get an in depth knowledge on digital systems
		CO2	To design digital circuits
		CO3	To get a knowledge on Finite State Machines
		CO4	To introduce VHDL and to familiarize the design of digital circuits using VHDL

EL010302	Control Systems	CO1	To understand the basic knowledge on control system and its classification
		CO2	To understand the basic knowledge on control system and its classification
		CO3	To study in detail the need for blockdiagram and signal flow graph representation
		CO4	To have an idea about the concept of stability and various techniques for stability analysis
		CO5	To understand the various plots used for analyzing control systems
		CO6	To introduce the concept of state space modeling of systems
		CO7	To discuss the various real time applications of control system including PLC and SCADA
EL010303	Object Oriented Programming	CO1	To acquire knowledge on Object Oriented Programming
		CO2	To introduce Python programming concepts in python
		CO3	To understand the Raspberry pi single board computer and its programming using Python
EL810301	Robotics	CO1	To get an introduction about Robots and robotics
		CO2	To understand the kinematics and dynamics of Industrial robotic arms and mobile robots
		CO3	To get an introduction about various types sensors and actuators for robotics
		CO4	To understand the design of robot controllers and programming of robotic systems
EL010304	Object Oriented Programming Lab	CO1	To acquire programming skills on Object oriented programming concepts in python
		CO2	To get a practical knowledge on interfacing Raspberry Pi with python
Semester IV			
EL010401	ARM Processor Based Embedded System	CO1	To equip the students to use ARM processor
		CO2	To get a thorough knowledge of using ARM processor with embedded c programming for application development
		CO3	To understand how practically apply gained

			theoretical knowledge in order to design, analyze and implement embedded systems
EL810403	Optical Sensor Technology	CO1	To get a basic understanding of fundamental principles of Optical Fiber Technology, different multiplexing techniques
		CO2	Analyze various premises, approaches procedures and results related to optoelectronic systems.
		CO3	To familiarize the different testing equipment for fiber optic communication
		CO4	To understand fiber optic network basics
		CO5	Study of components, devices and equipment of optoelectronic systems.
		CO6	Formation of Optical Fiber Communication System.
EL810402	Bio-medical Electronics	CO1	To understand the basics of instrumentation and various biomedical sensors
		CO2	To understand the measurement of physiological quantities
		CO3	To familiarize the various instrumentation related to biomedical equipment.