POSTGRADUATE PROGRAMME: COURSE OUTCOMES

Name of the Programme: M.Sc. Electronics

Name of the Class	Course Code	Course Title	Course Outcomes	
SEMESTER I				
M.Sc. I	ELUT111	Mathematical Methods in Electronics using C	CO1	Familiar with role of differential equations in applied electronics
			CO2	Understand the mathematical tools and techniques for network analysis
			CO3	Different methods of analysis for CT and DT signals and systems
			CO4	Concept of mathematical modeling of simple electrical circuits
			CO5	Solve the mathematical methods using C programming
M.Sc. I	ELUT112	Analog Circuit Design	CO1	apply the knowledge of basic semiconductor material physics
			CO2	Understand the characteristics and working of electronic devices like diode, transistor etc., and able to classify and analyze the various circuit configurations of Transistor and MOSFETs
			CO3	Analysis various device models
			CO4	Know the wideband and narrowband amplifiers using BJT
			CO5	Develop skills in analysis and design of analog circuits
			CO6	Designs of opamp applications
M.Sc. I	ELUT113	Digital System Design	CO1	Understand sequential and combinational logic design techniques
			CO2	Understand VERILOG language
			CO3	Design various digital circuits using VERILOG
			CO4	Analyze PLD, CPLD, FPGA and their applications
M.Sc. I	ELDT114	Design	CO1	Describe the differences between the

		Fundamentals and applications of PIC microcontrollers		general computing system and the embedded system, also recognize the classification of embedded systems.
			CO2	Become aware of the architecture of the PIC microcontroller and its programming aspects
			CO3	Become aware of interrupts, hyper threading and software optimization.
M.Sc. I	ELDP114	Practical Course I	**CO1**	Interface different devices with PIC microcontroller - Two-digit 7-segment display(multiplexed) - LCD / keyboard Interfacing - Bidirectional stepper motor interfacing - DAC interfacing (square wave, staircase, triangular, sine) use of timer for - Graphic LCD interfacing - DC motor control using PWM / intensity control of LED
M.Sc. I	ELUP115	Practical Course II	**CO1**	Understand and design the Electronic devices
			CO2	Understand the characteristics of semiconductor devices
			CO3	Design and built the circuit on breadboard

SEMESTER II

M.Sc. I	ELUT121	Applied Electromagnetics, Microwaves and Antennas	**CO1**	Introduce concepts of electromagnetics
			CO2	Understand the theory of transmission lines and wave guides
			CO3	Understand various parameters of antennas
			CO4	Know the various methods of generation of microwaves
M.Sc. I	ELUT122	Instrumentation and Measurement Techniques	**CO1**	understand the configurations and functional descriptions of measuring instruments
			CO2	understand the basic performance characteristics of instruments
			CO3	understand the working principles of various types of sensors and transducers and their use in measuring systems

			CO4	study the techniques involved in various types of instruments
			CO5	understand the relevance of electronics with other disciplines
M.Sc. I	ELUT123	Foundation of Semiconductor Devices	**CO1**	introduce crystal structure with reference to semiconductors
			CO2	introduce quantum and statistical mechanics
			CO3	understand the characteristics of semiconductor devices
			CO4	introduce theory of diode, transistor and FETs
			CO5	introduce crystal structure with reference to semiconductors
M.Sc. I	ELDT124	Fundamentals and applications of AVR Microcontroller	**CO1**	understand the architecture, assembly language and interfacing of AVR
			CO2	learn embedded C programming
			CO3	To learn software techniques to embed codes in to the systems
M.Sc. I	ELDP124	Practical Course I	**CO1**	Interface different devices with AVR microcontroller • LED array to generate different sequences • LCD / keyboard Interfacing • Bidirectional stepper motor interfacing • DAC interfacing (square wave, staircase, triangular, sine) use of timer for • Stepper motor • DC motor control using PWM / intensity control of LED
M.Sc. I	ELUP125	Practical Course III	**CO1**	understand the basic performance characteristics of instruments
			CO2	Build various types of Circuits
			CO3	understand the relevance of electronics with other disciplines
SEMESTER III				
M.Sc. II	ELT231	Advanced Communication systems	**CO1**	Analyze continuous wave/analog method of communication(AM, FM and PM) considering noise, its generation and demodulation techniques
			CO2	Compare different pulse modulation techniques(analog as well as digital)

			CO3	Analyze digital modulation techniques and related correction method
			CO4	Distinguish different radio wave propogation techniques
			CO5	Understand basic theory of antenna and their types as per applications
			CO6	Understand basics of modern communication techniques like satellite communication and mobile communication
M.Sc. II	ELT232	Mechatronics and Robotics	CO1	Identify different components or blocks in any mechatronic system
			CO2	Analyze mechatronic systems using system models and dynamic responses using transformation methods
			CO3	Distinguish different sensing and actuating mechanisms used in mechatronics and robotic systems
			CO4	Compare different control mechanisms used in robotic systems
M.Sc. II	ELT233	Control System	CO1	Compare different control loop systems such as open loop, closed loop, DCS, SCADA etc.
			CO2	Analyze the control systems using different mathematical techniques such as transfer function and different stability criterion
			CO3	Analyze and Distinguish different types of analog and digital controllers and control modes
			CO4	Identify components of control systems
			CO5	Design, develop and implement control systems for given applications
M.Sc. II	ELT234	Fundamentals of Internet of Things	CO1	Understand framework of Internet of things
			CO2	Identify architecture, structure and security as well as privacy aspects in IoT
			CO3	Design and configure RFID and WSN networks considering security issues
M.Sc. II	ELP234	Practical course	CO1	Install and implement IoT systems using different microcontrollers
			CO2	Demonstrate interfacing of LED,Buzzer, button and sensors to microcontrollers
			CO3	Design ,develop and implement IoT systems for basic applications such as ON/OFF LED etc
			CO4	Understand methodology to design IoT systems

M.Sc. II	ELP235	Practical course	CO1	Design and develop AM and FM transmission system
			CO2	Design and implement digital modulation systems and pulse modulation techniques
			CO3	Set up and implement mechatronic systems such as flow control or servo control using basic components like motors,sensors and actuators
			CO4	Design , develop and implement controller circuits for identified applications
SEMESTER IV				
M.Sc. II	ELT241	Industrial Training	CO1	Understand upcoming requirements in industry/institutions
			CO2	Adopt to new techniques or upcoming technologies
			CO3	Analyze the problem and solve using different techniques
			CO4	Requirement of skills in industry environment
M.Sc. II	EL242	MOOCs Courses	CO1	manage their own time in order to develop their intrinsic motivation and commitment to the course
			CO2	Ensure that the duration of the course is no longer than 8 weeks and remain in and complete shorter MOOCs
			CO3	transfer credits from MOOCs into institutional degree programs
			CO4	Foster self-directed learning environments to expand students' autonomy, encourage them to complete their weekly assignments, and provide opportunities for students with limited computer and language skills.
M.Sc. II	ELDT243	Technical Communication	CO1	Utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.
			CO2	Understand the nature and objective of Technical Communication relevant for the work place
			CO3	Imbibe inputs by presentation skills to enhance confidence in face of diverse readers.
			CO4	Evaluate and present gist of the books in the form of book review
			CO5	Prepare documents for thorough understanding of applications and promote their technical competence
M.Sc. II	ELDP244	Project/Internship	CO1	Gain experience in writing Technical reports/projects
			CO2	Expose to the responsibilities and ethics in

					industrial enviorment
				CO3	Familiarize with various materials, processes, products and their applications along with relevant aspects of quality control.
				CO4	Attain academic, professional and/or personal development
				CO5	Develop as future employers/entrepreneurs
				CO6	Understand the social, economic and administrative considerations that influence the working environment of industrial organizations
				CO7	Understand the psychology of the workers and their habits, attitudes and approach to problem solving