Programme Specific Outcomes,

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Course Outcomes of M.Sc

Department of Electronic Science

Academic Year

2021-22

Programme Specific Outcomes: M.Sc. Electronic Science

	Name of the Programme: M.Sc. Electronics	
	Program Specific Outcomes	
	At the end of the programme, student will be able to	
1	Identify, formulate, solve, analyze and interpret the problems in various disciplines of electronics using knowledge of mathematics and science.	
2	Design and conduct, manage electronic systems or processes that conforms to a given specification within ethical and economic constraints.	
3	Ability to function as a member of a multidisciplinary team with sense of ethics, integrity and social responsibility.	
4	Ability to communicate effectively in term of oral and written communication skills.	
5	Recognize the need for, and be able to engage in lifelong learning.	
6	Ability to use techniques, skills and modern technological/scientific/engineering software/tools for professional practices.	

Course Outcomes: M.Sc. Electronic Science

Class : M.Sc. Electronic Science		
Semester-I		
Paper	**Course code & course title**	**At the end of the course, student will be able to**
I	Mathematical Methods in Electronics using C (ELUT111)	Familiarise with role of differential equations in applied electronics
		Understand mathematical tools and techniques for network analysis
		Learn the methods of analysis for CT and DT signals and systems using Laplace and Z- transform
		Discribe the concept of mathematical modeling of simple electrical circuits.
		Solve mathematical methods using C programming.
		Understand various advanced features, graphics and interfacing & concept of object oriented programming in C++
II	Analog Circuit Design (ELUT112)	Understand the characteristics and working of electronic devices like diodes, BJTs, FETs, and MOSFETs
		Discribe the various anolog devices.
		Learn the wideband and narrowband amplifiers using BJT
		Develop skills in design and analysis of analog circuits
		Learn the operational amplifier and designs various opamp applications
		Understand practical design aspect for different application of Opamp.
III	Digital System Design (ELUT113)	Learn VERILOG language
		Design the sequential and combinational logic circuits.
		Understand and develop gate level modelling, Data flow modelling and behavioural modelling for different combinational and sequential circuits
		Learn use of delay, Test bench,task and Function in VERILOG.

		Study PLD, CPLD, FPGA and their applications
		Learn the types memories and it's data storage principle, control inputs, and timings, applications of various applications
IV	Fundamentals and applications of PIC microcontrollers (Elective Theory Course 1) ELDT114	Undestand PIC 18F microcontrollers architecture and pinout diagram
		Learn the instruction set and addressing modes
		Compare PIC with other microcontrollers and microprocessors
		Study the assembly language programming
		Learn generation of delay and wave forms. PWM control etc.
		Design and develop the Hardware interface for LEDs, 7segment display, LCD, Keypad interfacing, dc and stepper motor.
V	Practical Course 2 (Compulsory Course) (ELUP115)	Use of analog and digital multi meters, various types of power supply, CRO, Function generator in laboratory.
		Design, build, test and analyse the circuit with result of each experiments
		Familarize with Xilinix 9. 2 ISE simulator tool
		Design and perform the Verilog Programming in different modelling styles like gate level modelling, Data flow modelling and Behavioural modelling
		Familarize with MATLAB R12/ R2014 software
		Understand the MATLAB Programming language and design MATLAB code for given circuit and analysed result.
VI	Practical Course 1 (Elective Subject 1) ELDP114	Understand PIC 18 Microcintroller developing board
		Design and execute assembly/ C programs using MPLAB software.
		Develop interfacing with PIC microcontroller
		Learn step wise burn the program by use of Pickit2 programmer.
		Study the Hardware interface for LEDs, 7segment display, LCD, Keypad interfacing, dc and stepper motor

		Learn basic terms concepts and definitions

Semester-II		
I	Applied Electromagnetics, Microwaves and Antennas (ELUT121)	Understand the concepts of electromagnetics
		Describe the theory of transmission lines and wave guides
		Study basics of antenna and various parameters of antennas
		Undersand rectangular waveguide and circular waveguide
		Learn various methods of generation of microwaves
		Classify the various types of antennas and generation of microwaves
II	Instrumentation and Measurement Techniques (ELUT122)	Understand the configurations and functional descriptions of measuring instruments
		Learn the basic performance characteristics of instruments
		Describe the working principles of various types of sensors and transducers and their use in measuring systems
		Study the techniques involved in various types of instruments
		Study the static and dynamic characteristics of measurment systems.
		Learn the process parameter for different application of measurement system.
III	Foundation of Semiconductor Devices (ELUT123)	Understand crystal structure of solids with reference to semiconductors.
		Introduce quantum and statistical mechanics
		Learn the characteristics of semiconductor devices
		Study semiconductor in equlibrium and non-equlibrium state
		Describe the theory of diode, transistor and FETs
		Solve problems based on basics of semiconductor
IV	Elective Theory Course 2: Fundamentals and applications of AVR	Understand the architecture, instruction set, addressing modes AVR microcontrollers.
		Understand and develop assembly language program like arithmatic, logical, code converter, data transfer, ADC, timer and I/O ports

	microcontrollers (ELDT124)	Study the memory organization, timers, PWM, I/O ports, ADC, interrupts, serial communication of AVR microcontroller
		Learn embedded C programming for AVR microcontroller
		Build and analyse interfacing circuit like Displays, Motors, DAC, ADC, RTC
		Learn software techniques to execute codes in to the systems
V	Practical Course 4 (Compulsory Course) (ELUP125)	Use of analog and digital multi meters, various types of power supply, CRO, Function generator in laboratory.
		Design, build, test and analyse the circuit with result of each experiment
		Familarize with Sensors like LVDT, PT100, Thermocouple, Pressure sensors
		Understand the theory of Electromagnitics, Microwaves and antennas
		Familarize with MATLAB R12/ R2014 software
		Understand the MATLAB Programming language and perform the experiment and analysed observed result with calculated result for Experiments on Electromagnetics and antennas
VI	Practical Course 3 (Elective course 2) (ELDP124)	Understand AVR atmega 16/32 Microcintroller developing board
		Develop assembly/ C programming language and software use for programming
		Learn Interfacing with AVR AtMega 16/32 microcontroller
		Learn step wise burn the program through AVRStud/ MPLAB software
		Study the Hardware interface for LEDs, 7segment display, LCD, Keypad interfacing, dc and stepper motor
		Learn basic terms concepts and definitions

Class : M.Sc. Subject -II		
Semester-III		
Paper	**Course code & course title**	**At the end of the course, student will be able to**
I	Advanced Communication Systems (ELT 231)	Recall and understand continuous wave/analog method of communication(AM, FM and PM) considering noise, its generation and demodulation techniques
		Learn different pulse modulation techniques(analog as well as digital)
		Analyze digital modulation techniques and related correction methods
		Distinguish different radio wave propogation techniques
		Understand basic theory of antenna and their types as per applications
		Study basics of modern communication techniques like satellite communication and mobile communication
II	Mechatronics and robotics (ELT 232)	Identify different components or blocks in any mechatronic system
		Understand function of different component of mechatronic and robotics
		Analyze mechatronic systems using system models and dynamic responses using transformation methods
		Distinguish different sensing and actuating mechanisms used in mechatronics and robotic systems
		Compare different control mechanisms used in robotic systems
		Apply and analyize driving dynamic equation for robotic.
III	Control System (ELT 233)	Compare different control loop systems such as open loop, closed loop, DCS, SCADA etc.
		Analyze the control systems using different mathematical techniques such as transfer function and different stability criterion
		Analyze and Distinguish different types of analog and digital controllers and control modes
		Study the principal of working of the components of control systems.
		Design and analyze the control system using ladder programming.
		Design, develop and implement control systems for given applications

IV	Fundamentat of Internet of Things (ELT 234)	Learn the bascis of Internet of Things and Framework of IoT.
		Study the data and knowlege management and use of devices in IoT technology.
		Dentify architecture, structure and security as well as privacy aspects in IoT
		Gain knowlage and study the fundamental of internet of things (IoT) and coomunication capability.
		Understand, design and configure Redio Frequency Identifier (RFID) networks considering security issues
		Learn, design and configure Wireless Sensor Network (WSN) considering security issues
V	Elective Practical Course (ELP 234)	Understand the Ardino /Rasberri pi for the practical impilmentation.
		Learn the installation of the Ardino IDE software and simple progamming through it.
		Study the basic building blocks of IoT and identify it as per application.
		Familiar with IoT protocols.
		Develope interfacing of the input output devices with Ardino /Rasberri pi: LED, LCD , Push button.
		Design and developed application of IOT; to interface the bluethoot device to Ardunio/Rasberri pi.
VI	Electronics Science Practical Course (ELP 235)	Use of analog and digital multi meters, various types of power supply, CRO, Function generator in laboratory.
		Design and develop AM and FM transmission system
		Design and implement digital modulation systems and pulse modulation techniques
		Set up and implement mechatronic systems such as flow control or servo control using basic components like motors,sensors and actuators
		Design , develop and implement controller circuits for identified applications
		Learn basic terms concepts and definitions

Semester-IV		
I (Elective)	PLC Programming and Applications (ELT241 & ELP241)	Understand basics of Programmable Logic Controllers, their working and their programming
		Design, modify and troubleshoot such control circuits
		Program PLCs to automate the systems for different applications
		Explain the use of industrial grade components in automation
		Understand relay logic diagram and its use in different applications
		Learn demanding skill required in upcoming Engineers.
I (Elective)	Industrial Training (ELP241*)	Choose industry according to interest
		Understand upcoming requirements in industry/institutions
		Adopt to new techniques or upcoming technologies
		Analyze the problem and solve using different techniques
		Acquire Required skills according to industrial environment
		Present the workdone in the form of seminar/ presentation and write the report.
II	MOOCs Courses (ELT242)	Foster self-directed learning environments to expand autonomy.
		Learn to manage own time in order to develop intrinsic motivation and commitment to the course
		Gain to earn credits from MOOCs into institutional degree programs
		Search opportunities for students with limited computer and language skills.
		Learn to complete the weekly assignments
		Learn using new and modern platform for topics which are not in curriculum or on advanced topics like SWAYAM and NPTEL
III	Technical Writing (ELT243)	Utilize the technical writing for the purposes of Technical Communication and its exposure in various dimensions.
		Understand the nature and objective of Technical Communication relevant for the work place
		Imbibe inputs by presentation skills to enhance confidence in face of diverse readers.
		Evaluate and present gist of the books in the form of book review

		Prepare documents for thorough understanding of applications and promote their technical competence
		Learn basic concept and definitions
IV	Project/ Internship (ELP244)	Design hypothesis for their work to be carried out. And Describe the underlying theory of experiments in the project work.
		Perform derivations of theoretical models of relevance for the experiments in the project.
		Document their results, using correct procedures and protocols.
		Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant.
		Interpret relationships in graphed data and develop an intuition for alternative plotting methods and communicate results from project work, orally or in a written laboratory report.
		Write a project report with literature review and Defend the outcome of project work in scientific manner.