DEPARTMENT OF ELECTRONIC SCIENCE

B. Sc. Electronic Science

Goals :

The Department has formulated three broad educational goals for the undergraduate degree programs:

Electronics knowledge: The goal of the three-year course is to instill in students confidence that they can get a grip of the subject and apply it for designing, testing and analyzing systems. The course will also make use of problem-solving approach wherein the students will be trained to apply the acquired knowledge to design and analyze circuits for specific applications. The students will be familiarized with programming languages, various development tools, and modeling and simulation tools through lab sessions

Problem solving skills: To provide students with the tools needed to analyze problems, apply mathematical formalism and experimentation, and synthesize ideas.

Employment and technical skills: To provide the students with technical skills necessary for successful careers in Electronics and related or alternative careers for which Electronics can be very useful. These include physics, mathematics, computers, Nano-science and devices, and communication skills (oral and written).

Programme Outcomes :

Knowledge outcome:

After completing B.Sc. Electronics Programme students will be able to:

PO1: Transfer and apply the acquired fundamental knowledge of Electronics, including basic concepts and principles of 1) Analog ,Digital ,Communication system, instrumentation, Semiconductor, Microcontroller,Nano-electronics,Fiber optics , power electronics, industrial automation ,various languages like- Assembly & c and software's like –Keil , Xilinx, TurboC + +, MATLAB; (2) mathematical (analytic and numerical) methods and experimental methods for Electronics to study different branches of Electronics

PO2: Demonstrate the ability to translate a physical description to a mathematical equation, and conversely, explain the physical meaning of the mathematics, represent key aspects of Electronics through diagram and graphs and also use software's and geometric arguments in problem-solving.

Skills Outcomes:

Professional Skills

After completing B.Sc. Electronics Programme students will be able to:

PO3: Apply and demonstrate knowledge of concepts of electronics, to analyze a variety of basic phenomena.

PO4: Demonstrate the learned laboratory skills, enabling them to take Experiments in an electronics laboratory and analyze results.

PO5: Capable of oral and written scientific communication, and will prove that they can think critically and work independently.

PO6: Communicate effectively using development tools, reports and presentations within a scientific environment.

PO7: Use and apply professional software for scientific data analysis and presentation

PO8: Respond effectively to unfamiliar problems in scientific contexts.

PO9: Plan, execute and report the results of a complex extended experiment or

investigation, using appropriate methods to analyze data and to evaluate the level of its uncertainty

PO10: Integrate and apply these skills to study different branches of electronics.

Generic Competencies:

PO11: Work comfortably with numbers and analyzing an issue quantitatively, acquire knowledge effectively by self-study and work independently, present information in a clear, concise and logical manner and apply appropriate analytical and approximation methods.

Attitude/Value Outcomes:

After completing B.Sc. Electronics Programme students should have developed some positive attitudes and will have:

PO12: Willingness to take up responsibility in study and work Confidence in his/her capabilities Capacity to work effectively in a team Motivation for learning and experimentation

Program Specific Outcomes

After completing B. Sc. Electronics, students will be able to

PSO1: Demonstrate and understanding of principles and theories of electronics. These include: Basics of Applied Electronics**,** Electronic Devices and Circuits, Fundamentals of Digital Electronics, Analog and Digital device Applications, Semiconductor, Nano-Electronics, Fiber-optics, Microcontroller, and Power electronics;

PSO2: Apply mathematics, physics as well as computerized methods to solve electronics problem

PSO3: Demonstrate ability to apply knowledge learned in classroom to set and perform simple laboratory experiments;

PSO4: solve electronics problems using the appropriate methods in mathematical, theoretical and computational electronics

Course Outcomes :

F.Y.B.Sc. Electronics

Course-1,Sem-1: Basics of Applied Electronics

After successfully completing this course, the student will be able to:

CO1: Understand importance of Electronics in day today life

CO2: Understand basics of electronic circuits

CO3: Learn basic components of electronics

CO4: Identify different parameters/functions/specifications of components used in electronic circuits

CO5: Make the students learn through problem solving

CO6: Define basic network theorems like-KVL, KCL,Norton, superposition and maximum power transfer theorems

CO7: solve problems based on network theorems

CO8: Perform simulations using simulator for analyzing network performance

CO9: Understand few electronic systems

CO10: Learn more about it's the building block, working principle and features of some electronics systems

Course-2,Sem-1: Electronic Devices and Circuits

After successfully completing this course, the student will be able to:

CO1: Knowing more about basics of Semiconductor Devices and its parameters
CO2: Know about the details of diode, transistors, FET and MOSFETS s.
CO3: Learn its working principle, characteristics
CO4: Study the types of diode, transistor, FET, MOSFET
CO5: Build and understand application circuits of electronic devices.
CO6: Encourage the students for making use of simulation software for testing the circuits before experimentation
CO7: Analyze performance parameters based on study of characteristics of electronic devices like diode, transistors etc.
CO8: Choose proper electronic devices as per the need of application
CO9: Perform simulations for designing and analyzing diode/transistor circuits
CO10: Build and test the circuits like street light controller using electronic devices

Course-3,Sem-1: Electronics Lab IA

After successfully completing this course, the student will be able to:

CO1: Teach students how to draw different symbols and circuit diagrams
CO2: Develop skill of circuit connections
CO3 : Familiarize the student with different components and devices used in the laboratory and the device manuals
CO4: Identify different components and devices as well as their types
CO5: Familiarize students with laboratory instruments like Ammeter, voltmeter, DMM, Signal Generator, Function Generator, CRO and tools like cutter, stripper etc.
CO6: Understand basic parameters associated with each device
CO7: Know operation of different instruments used in the laboratory
CO8: Train them to design and analyze the circuits for specific purpose
CO9: Connect circuit and do required performance analysis
CO10: Teach the students how to analyze the results and calculate performance parameters
CO11: Compare simulated and actual results of given particular experiment
CO12: Motivate them to work on different mini projects

Course-1,Sem-2: Fundamentals of Digital Electronics

After successfully completing this course, the student will be able to:

CO1: Understand the importance of number system and codes
CO2: Know about different number systems and codes
CO3: Solve problems based on inter conversion of number systems
CO4: Understand logic gates and truth tables
CO5: Study the Booleans algebra and theorems
CO6: Reduce the expression using Boolean theorems
CO7: Reduce expressions using K maps in SOP and POS forms
CO8: Understand the concept of ALU unit
CO9: Understand combinational logical circuits
CO10: Identify the combinational circuits and finding out its expression and truth table
CO11: Understand sequential logical circuits
CO12: Understand how to use flip flops to build modulus counter
CO13: Familiarize with applications of counters like ring counter or event counter
CO14: Encourage the students for making use of simulation software for testing and building the circuits before experimentation.

Course-2,Sem-2: Analog and Digital Device applications

After successfully completing this course, the student will be able to:

CO1: Know basics of operational amplifier
CO2: Understand the basic concept use in opamp
CO3: Compare performance parameters of opamp ICs available in market
CO4: Understand opamp circuits and its usefulness in different applications
CO5: Basics of timer IC 555 and its applications
CO6: Understand data converters and their performance parameters
CO7: Know operating principle of IC 555 in different configurations
CO8: Understand different types of DAC and their performance parameters
CO9: Study different types of ADC and their performance parameters

Course-3,Sem-2: Electronics Lab IA

After successfully completing this course, the student will be able to:

CO1: Study the pin configuration of opamp, IC555 and understand function of each pin
CO2: Understand features of laboratory instruments like Ammeter, voltmeter, DMM, Signal Generator, Function Generator, CRO
CO3: Build opamp configurations and study its performance
CO4: Build application circuits of opamp and study its performance
CO5: Connect opamp circuits and analyze the output
CO6: Build application circuits of IC555
CO7: Design the output frequency of IC 555 as astable/monostable multivibrator
CO8: Understand types of ADC and DAC and its performance parameters like accuracy, ` resolution etc.
CO9: Teach the students how to analyze the results and calculate performance parameters
CO10: Compare simulated and actual results of given circuit

S.Y.B.Sc

EL211Analog Circuit Design

After successful completion of the course the student will be able to:

CO1: Study the general classification of amplifier
CO2: Study basic principles of amplifiers and oscillators
CO3: Compare the voltage amplifier and power amplifier
CO4: Understand the working of various analog circuits.
CO5: Develop analog circuit design skills.
CO6: Understand the Feedback system its types and application
CO7: Study the differential Amplifier and application of opamp
CO8: Apply the knowledge of analog circuits in different applications.

EL 212 Digital Circuit Design

After successful completion of the course the student will be able to:

CO1: Utilize k-maps in the design of combinational circuits.
CO2: Design some code convertors by using k-map
CO3: Understand the design principles of sequential circuits.
CO4: Study the design and working of various data converters
CO5: Study DAC and ADC, its types and performance
CO6: Configure the digital circuits in system interfacing and applications.
CO7: Learn the application of counters

EL 221 Electronic Instrumentation

After successful completion of the course the student will be able to:

CO1: Study the block diagram of electronic instruments
CO2: Understand the construction and working principles of frequently used instruments.
CO3: Know important technical specifications of an instruments.
CO4: Learn the operating procedure of instruments.

EL 222 Communication Electronics

After successful completion of the course the student will be able to:

CO1: Study basics of communication systems and types
CO2: Study the electromagnetic spectrum with application and concept of Noise and types
CO3: Study telephone system and block diagram of PSTN
CO2: Study the need of modulation and its types
CO2: Understand Amplitude and Frequency Modulation.
CO6: Learn the AM and Modulators and their advantages, disadvantages
CO3: Understand basics of AM and FM Receivers.
CO4: Study the digital communication system.

EL 203 Practical Course

After completing this practical course student will be able to

CO1: Identify different components and devices as well as their types
CO2: Familiarize students with laboratory instruments like Ammeter, voltmeter, DMM, Signal Generator, Function Generator, CRO and tools like cutter, stripper etc.
CO3: Make use of basic concepts for building different electronic circuits..
CO4: Understand design procedures of different electronic circuit as per requirement
CO5: Build experimental setup and test the circuits.
CO6: Develop skills of analyzing test results of given experiments.
CO7: Compare simulated and actual results of given particular experiment

T.Y. B.Sc.

EL 331 Advanced Digital System Design

After successful completion of the course the student will be able to:

CO1: Understand the digital system design process and design flow and sequential machine model
CO2: Study the state reduction techniques, ASM Symbols
CO3: Understand the importance of VHDL, features, modeling concepts
CO4: Study the basic concept of Verilog
CO5: Study the types of modeling and acquire knowledge of write Verilog codes for some Combinational and sequential circuits
CO6: Introduce PLDs and compare fixed function ICs and PLDs
CO7: Study the types of PLDs and its application
CO8: Study Traffic light controller, Stepper motor sequence generator, Vending machine, Tablet filling system

EL-332 Microcontrollers

After successful completion of the course the student will be able to:

CO1: Compare the Microcontroller and microprocessor
CO2: Learn architecture of 8-bit microcontroller, block diagram, pin configuration, features and SFRs
CO3: Use instruction set and addressing modes of microcontroller

CO4: Develop assembly language programming skills
CO5: Writing the Assembly codes for arithmetic, logical, code conversion, block data transfer.
CO6: Study Development tools and integrated development Environment
CO7: Interface memory and I/O devices and write the assembly code

EL-333 Analog Circuit Design and Applications of Linear ICs

After successfully completing this course, the student will be able to:

CO1: Study the practical design aspects while using Opamp
CO2: Study the basic application circuits of Opamp
CO3: Learn the specifications and selection criterion for linear ICs
CO4: Obtain information about different special purpose ICs and their applications
CO5: Refer and understand data manuals

EL-334 Principles of Semiconductor Devices

After successful completion of the course the student will be able to:

CO1: Introduce crystal structure with reference to semiconductors
CO2: Study the theory of metal-semiconductor and p-n junctions
CO3: Understand the characteristics of semiconductor devices
CO4: Introduce theoretical background of BJT and FETs

EL -335 'C' Programming

After successful completion of the course the student will be able to:

CO1: Understand fundamentals of C language.
CO2: Develop algorithm/flowcharts for problem solving and writing programs.
CO3: Learn to use functions, arrays, pointers and file handling in C language.
CO4: Study different types of algorithm.

EL-336: A) Fiber Optic Communication

After successful completion of the course the student will be able to:

CO1: Understand the principles of fiber optic communication system.
CO2: Learn measure different parameter of optical fibers.
CO3: Understand essential optical components of Fiber Optic Communication
CO4: Study the applications of fiber optic communication systems.

EL-341 Advanced Communication Systems

CO1:Study the basics of antenna, types and propagation of antenna
CO2: Study the Modulation and demodulation
CO3: Understand the AM &FM Transmitter using various methods
CO4: Study TV transmitter, Mobile receiver, Doppler radar, speed gun and low noise amplifier
CO5: Understand importance of digital modulation and its techniques
CO6: Study the block diagram of digital modulation system

EL-342: Microcontroller and its Applications

After successful completion of the course the student will be able to:

CO1: Study the advantages of c-language over assembly language
CO2: Study different data types used in c –language for 8051 Programming with examples
CO3: Use 'C' language for programming the microcontrollers

CO4: Learn to use Timers, Interrupts and Serial Communication in Microcontroller and write code for various task
CO5: Apply the knowledge in real world applications using embedded 'C'
CO6: Introduction to PIC microcontroller

EL- 343: Power Electronics

After successful completion of the course the student will be able to:
CO1: Compare single phase and three phase
CO1: Introduce to basics of power electronics and familiar with Power Electronic Devices, Circuits and applications
CO2: Learn about power devices and protections of devices
CO3: Study various types of power circuits
CO4: Study applications of power electronics

EL -344: Foundation of Nano electronics

After successful completion of the course the student will be able to:
CO1: Learn essential principles of Electromagnetics
CO2: Know the principles of quantum mechanical aspects
CO3: Know the principles of Statistical aspects
CO4: Study the basics of Nano electronics
CO5: Learn different applications of Nanoelectronics

EL- 345: Mathematical Methods and Circuit Analysis using MATLAB

After successful completion of the course the student will be able to:
CO1: Learn features of MATLAB as a programming tool.
CO2: Promote new teaching model that will help to develop programming skills and technique to solve mathematical problems.
CO3: Understand Laplace Transform and Fourier series and its applications.
CO4: Use MATLAB as a simulation tool.
CO5: Do the mathematical Application using MATLAB

EL-346: A) Industrial Automation

After successful completion of the course the student will be able to:
CO1: Explain the interaction of radiation with matter, Quantum behavior of light, thermal equilibrium and population inversion.
CO2: Illustrate the absorption, spontaneous and stimulated emission with appropriate diagrams.
CO3: Derive the Einstein's relation, conditions for large stimulated emission and light amplification.
CO4: Distinguish between ordinary light and laser light.
CO5: Define the characteristics of laser light.

EL-347 Practical Course- I

After successful completion of the course the student will be able to:
CO1: Refer the various datasheets of the electronic devices and integrated circuits
CO2: Learn how to select the devices, sensors, actuators and ICs for a particular application
CO3: Develop the basic skills required to handle the various instruments
CO4: Learn the designing aspects of circuits/ systems
CO5: Build experimental setup and test the circuits.

CO6: Develop skills of analyzing test results of given experiments.
CO7: Compare simulated and actual results of given particular experiment

EL-348 Practical Course- II

After successful completion of the course the student will be able to:

CO1:Learn the basic C-Programming
CO2: Learn Verilog HDL to design basic combinational and sequential circuits
CO3: Get familiar with structural, data flow and behavioral modeling
CO4: Learn assembly level language of 8051 microcontroller.
CO5: Use cross compiler to develop C-programs for microcontroller
CO6: Study the various interfacing circuits to 8051 microcontroller
CO7: Stimulate the result using simulator and examine the result

EL-349 Practical Course- III

After successful completion of the course the student will be able to

CO1: Choose name and subject of the project type must be well defined
CO2: Planning of the work must be specified
CO3: Theoretical, reference work must be provided
CO4: Pilot experimentations / Preparations must be specified
CO5: Typical design aspects, theoretical aspects, aim and objectives of the work must be specified in detail
CO6: The actual work done must be reported along with experimentation procedures
CO7: There must be observations, interpretations, conclusions, results of the project work
CO8: Algorithm, program strategy, module wise description of parts etc. be provided in case of Projects related with development of computer software
CO9: Applications, usefulness, student's contribution in it must be clearly specified
CO10: Further extension work may be suggested for better outcome of the project
CO11: It is recommended to present the projects in competitions / project exhibitions organized by various authorities

DEPARTMENT OF ELECTRONICS
M.Sc. ELECTRONICS

Goals :

The Department has formulated three broad educational goals for the undergraduate degree programs:

Electronics knowledge: To provide students with the basic foundation in Electronic and Nano technology, the interplay of theory and experiment, and to motivate scientific enthusiasm and curiosity and the joy of learning. The course will also make use of problem-solving approach wherein the students will be trained to apply the acquired knowledge to design and analyze circuits for specific applications. The students will be familiarized with programming languages, various development tools, modeling and simulation tools through lab sessions

Employment and technical skills: To provide the students with technical skills necessary for successful careers in Electronics and related or alternative careers for which Electronics can be very useful. These include physics, mathematics, computers, Nano-science and devices, and communication skills (oral and written).

Problem solving skills: To provide students with the tools needed to analyses problems, apply mathematical formalism and experimentation, and synthesize ideas.

Employment and technical skills: To provide the students with technical skills necessary for successful careers in Electronic/Nano-technology and related or alternative careers for which a

Electronic foundation can be very useful. These include mathematics, computers, electronics and devices, and communication skills (oral and written).

Programme Outcomes

The Master of Science in Electronic programmer provides the student with knowledge, general competence, and analytical skills on an advanced level, needed in academics, industry, research, or public administration.

Knowledge

Students will

After completing M.Sc. Electronics Programmers students will be able to:

PO1: Transfer and apply the acquired fundamental knowledge of Electronics, including basic concepts and principles of 1) Analog ,Digital ,Communication system, instrumentation, Semiconductor, Microcontroller, Nano-electronics, Fiber optics , power electronics ,various languages like- Assembly & c and software's like –Keil , Xilinx, Turbo C + +, MATLAB;

(2) mathematical (analytic and numerical) methods and experimental methods for Electronics to study different branches of Electronics

PO2: get substantial knowledge in electronic, basic knowledge in mathematics, and understanding of the interconnectedness of different disciplines;

PO3: get some research experience within a specific field of electronic, through a project work;

PO4: get ability to apply knowledge of electronic to the real world problems;

PO5: be familiar with contemporary research within various fields of electronic;

PO6: use creativity, critical thinking, analysis and research skills to solve theoretical and real-world problems

Skills

Students will

After completing M.Sc. Electronics Programme students will be able to:

PO7: Apply and demonstrate knowledge of concepts of electronics, to analyze a variety of basic phenomena

PO8: Demonstrate the learned laboratory skills, enabling them to take Experiments in an electronics laboratory and analyze results

PO9: Capable of oral and written scientific communication, and will prove that they can think critically and work independently.

PO10: Communicate effectively using development tools, reports and presentations within a scientific environment.

PO11: Use and apply professional software for scientific data analysis and presentation

PO12: Respond effectively to unfamiliar problems in scientific contexts

PO13: Plan, execute and report the results of a complex extended experiment or investigation, using appropriate methods to analyze data and to evaluate the level of its uncertainty

PO14: Integrate and apply these skills to study different branches of electronics.

General competence

The student will

PO15: be able to understand the role of electronic in society and has the background to consider ethical problems.

PO16: know the historical development of electronic, its possibilities and limitations, and

understands the value of lifelong learning.

PO17: get an ability to participate in constructive discussions and debates.

PO18: Work comfortably with numbers and analyzing an issue quantitatively, acquire knowledge effectively by self-study and work independently, present information in a clear, concise and logical manner and apply appropriate analytical and approximation methods.

Programme Specific Outcomes

After completing M.Sc.Electronics, students will be able to:

Attitude/Value Outcomes:

After completing M.Sc. Electronics Programme students should have developed some positive attitudes and will have:

PO19: Willingness to take up responsibility in study and work Confidence in his/her capabilities Capacity to work effectively in a team Motivation for learning and experimentation.

Program Specific Outcomes:

After completing M. Sc. Electronics, students will be able to

PSO1: Demonstrate and understanding of principles and theories of electronics. These include: Basics of Applied Electronics**,** Electronic Devices and Circuits, Fundamentals of Digital Electronics, Analog and Digital device Applications, Semiconductor, Nano-Electronics, Fiber-optics, Microcontroller, and Power electronics;

PSO2: Apply vector algebra, differential and integral calculus as well as graphical methods to solve physics problems;

PSO3: Demonstrate ability to apply knowledge learned in classroom to set and perform simple laboratory experiments;

PSO4: solve electronics problems using the appropriate methods in mathematical, theoretical and computational electronics

PSO3: Demonstrate ability to apply knowledge learned in classroom to plan, undertake, and report on a programme of original work; including the planning and execution of experiments, the analysis and interpretation of experimental results;

PSO4: take research work at the higher degree level in the field of nanotechnology, computational electronic and material science.

Course Outcomes:

M. Sc. Electronic Part I

ELUT111: Mathematical Methods in Electronics using C

After successfully completing this course, the student will be able to:

CO 1. To get familiar with role of differential equations in applied electronics

CO 2. To know about mathematical tools and techniques for network analysis

CO 3. To learn the methods of analysis for CT and DT signals and systems

CO 4. To learn concept of mathematical modeling of simple electrical circuits

CO 5. To solve mathematical methods using C programming

CO 6. To learn various advanced features, graphics and interfacing

CO 7. To learn concepts of object oriented programming in C++

ELUT112: Analog Circuit Design

After studying this course the student will be able to:

CO1. To learn the characteristics and working of electronic devices

CO 2. To study the various device models

CO 3. To study the wideband and narrowband amplifiers using BJT

CO 4. To develop skills in analysis and design of analog circuits

CO 5. To study the designs of op-amp applications

ELUT113: Digital System Design

After studying this course the student will be able to:

CO 1. To understand sequential and combinational logic design techniques

CO 2. To introduce VERILOG

CO 3. To learn various digital circuits using VERILOG

CO 4. To learn PLD, CPLD, FPGA and their applications

ELDT114: BASICS OF FIBER OPTIC COMMUNICATION

After studying this course the student will be able to:

CO 1. To understand basics of optical fiber

CO 2. To know about the types of optical fibers

CO 3. To understand fiber optic communication system

ELDT114: Fundamentals and applications of PIC microcontrollers

After successful completion of the course the student will be able to:

CO 1. To study the PIC microcontrollers

CO 2. TO learn assembly language programming PIC microcontroller.

CO3. To study the Hardware interface for LEDs, 7segment display, LCD, Keypad interfacing, dc and stepper motor.

ELUT121: Applied Electromagnetic, Microwaves and Antennas

After studying this course the student will be able to:

CO 1. Apply the laws of electromagnetism and Maxwell’s equations in different forms and different media

CO 2 Discuss origin of Maxwell's equations in magnetic and dielectric media and understand transport of energy and Poynting vector.

CO 3. To understand the theory of transmission lines and waveguides

CO 3. To study various parameters of antennas

CO 4. To study various methods of generation of microwaves

ELUT122: Instrumentation and Measurement Techniques

After studying this course the student will be able to:

CO 1. To understand the configurations and functional descriptions of measuring instruments
CO 2. To understand the basic performance characteristics of instruments
CO 3. To understand the working principles of various types of sensor sand transducers and their use in measuring systems
CO 4. To study the techniques involved in various types of instruments
CO 5. To understand the relevance of electronics with other disciplines

ELUT123: Foundation of Semiconductor Devices

After studying this course the student will be able to:

CO 1. To introduce crystal structure with reference to semiconductors
CO 2. To introduce quantum and statistical mechanics
CO 3. To understand the characteristics of semiconductor devices
CO 4. To introduce theory of diode, transistor and FETs

ELDT124: FIBER OPTIC COMMUNICATION SYSTEM

After studying this course the student will be able to:

CO 1. To understand types of optical cables, connectors etc
CO 2. To understand integrated optics and their components
CO 3. To understand design of optical fiber communication system

ELDT124: Fundamentals and applications of AVR Microcontroller

After successful completion of the course the student will be able to:

CO 1. To understand the architecture, assembly language and interfacing of AVR
CO 2. To learn embedded C programming
CO 3. To learn software techniques to embed codes in to the systems

ELDP114: PRACTICAL COURSE I

After successfully completing this course, the student will be able to:

CO1: Make use of analog and digital multi meters, various types of power supply, CRO, Function generator.
CO2: Classify between AC and DC voltage and current.
CO3: Identify passive and active electronic components.
CO3: Identify passive and active electronic components.
CO4: Design, build, test and analysis of result of each experiments

M. Sc. Electronic Part II

EL3UT09: Communication Electronics

After studying this course the student will be able to:

CO 1. To learn analog modulation techniques
CO 2. To study basics of information theory and digital communication
CO 3. To study various data digital communication systems
CO 4. To learn fundamentals of radio wave propagation and Antennas
CO5. To make students aware of various communication technologies

EL4UT10: Control Systems

After studying this course the student will be able to:

CO 1. To make student familiar with basic concepts of control theory
CO 2. To understand different control strategies
CO 3. To develop problem solving attitude
CO 4. To impart information about control instrumentation
CO 5. To make students familiar with latest trends in industrial control / production systems

ELDT01: Advanced Power Electronics

After studying this course the student will be able to:

CO 1. To study the basic principles and applications of power electronics
CO 2. To understand the solid-state devices required for power electronic circuits
CO 3. To study and understand the power conversion and power transmission principles
CO 4. To study the industrial and domestic applications

ELDT02: Advanced Embedded Systems

After studying this course the student will be able to:

CO 1. To study the architecture of Advanced RISC machine (ARM7)
CO 2. To learn assembly level programming of ARM-7 and interfacing hardware
CO 3. To get acquainted to fundamentals of operating system
CO4. To get familiar with real time operating system (RTOS)
CO 5. To introduce one of RTOS in detail

ELDT03: Digital Signal Processing

After studying this course the student will be able to:

CO 1. To get acquainted to fundamental aspects of Digital Signal Processing (DSP)
CO 2. To become aware of mathematical background required for DSP
CO 3. To learn design of digital filters and implementation on digital Signal Processor
CO 4. To study DSP applications

ELDT04: Mechatronics

After studying this course the student will be able to:

CO 1. To introduce the students of Electronic Science to the subject of mechatronics
CO 2. To review the concepts of sensors, transducers and actuators, with a view to use them in mechatronic systems
CO 3. Enable the learner to acquire basic knowledge of mechanical systems to be used with electronic systems
CO 4. To introduce the concept of models for electrical and mechanical systems and their combinations for building system models for predicting the behavior of electromechanical systems
CO 5. To provide a quick overview of the communication systems and protocols used in mechatronics

ELDT05: Digital Image Processing

After studying this course the student will be able to:

CO 1. To make the students aware of basic mathematics required for image processing

CO 2. To make students familiar with different image processing algorithms

CO 3. To provide the students with the knowledge of practically implementing the algorithms for various applications

ELDT06: Optoelectronics and Fiber Optic Communication

After studying this course the student will be able to:

CO 1. To become aware of different optoelectronic devices and systems

CO 2. To acquire Knowledge of optical fiber communication system

CO 3. To study optical fiber sensors and their applications

ELDT07: Nanoelectronics and Devices

After studying this course the student will be able to:

CO 1. To become aware of basics of quantum and statistical techniques

CO 2. To study various growth techniques of nano materials

CO 3. To study characterization techniques of nano materials

CO 4. To become aware of nano materials and some nano structured devices

ELDT08: Programmable Logic Controllers and Applications

After studying this course the student will be able to:

CO 1. To make the students aware of programmable logic controller hardware

CO 2. To introduce students to PLC programming

CO 3. To study some case studies using PLC and introduce distributed control systems

ELDT09: VLSI System Design

After studying this course the student will be able to:

CO 1. To study MOS transistor, its characteristics, MOS models

CO 2. To study the various MOS technologies used for VLSI

CO 3. To learn VLSI design and layout design rules

CO 4. To design simple combinational and sequential digital logic circuits

ELDT10: Robotics-Kinematics and Control

After studying this course the student will be able to:

CO 1. To familiarize the learner with terminologies used in robotics.

CO 2. To provide to background of representations of axis rotations, homogeneous transformations and their use in kinematics.

CO 3. To introduce robot dynamics and robot joint control systems

ELDT11: Wireless Sensor Networks

After studying this course the student will be able to:

CO 1. To familiarize with wireless sensor network.

CO2. To provide a background of single-node architecture and wireless networking protocols

CO 3. To study currently available sensor platforms and tools

ELDT12: Digital Communication

After studying this course the student will be able to:

CO1.To provides a background of signals, their characteristics and mathematical representations and noise in signals

CO 2. To introduce various digital modulation techniques

CO 3. To study get introduced with information and coding theory of digital communication

ELDT13: Computational Methods for Electronics

After studying this course the student will be able to:

CO 1. To learn with the help of relevant illustrations in electronics.

CO 2. Use of MATLAB and other software tools be made while discussing the importance of each of the topics.

CO 3. Activities based on the survey and use of online sources available on internet be given to the students.

Project

After successful completion of the course the student will be able to

CO1: Design hypothesis for their work to be carried out.

CO2: Describe the underlying theory of experiments in the project work.

CO3: Perform derivations of theoretical models of relevance for the experiments in the project.

CO4: Document their results, using correct procedures and protocols.

CO5: Perform a quantitative analysis of experimental data including the use of computational and statistical methods where relevant.

CO6: 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.

CO7: Write a project report with literature review.

CO8: Defend the outcome of project work in scientific manner.

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