Humanities and Commerce Programs

OPEN ELECTIVE COURSE

Course Title: Electronics for Everyone

Course Outcomes (CO)

1. Develop basic knowledge on electronics
2. Construct any basic electronic circuit and analyse its working
3. Acquire skills to plan, build and execute electronic project of their own.

Course Title: Electronic Fundamentals and Digital Electronics

Course Outcomes (CO)

1. Study and analyze basic networks using network theorems in a systematic manner.
2. Familiarize with the basic operation of electronic devices and circuits and build simple electronic circuits used in various applications.
3. Understand various fundamental principles of network analysis, number systems and Boolean algebra

Course Title: Domestic Electronics

Course Outcomes (CO)

1. Study the basic concepts of Electronics.
2. Familiarize with the working principle of various electronic components
3. Understand the working of different home appliances and consumer electronic systems

Course Title: Energy Audit and Management

Course Outcomes (CO)

1. Understand the need for renewable energy and identify different sources of energy

2. Familiarize with the power generation using solar energy and wind energy

3. Appreciate the importance of energy audit and integrate various options for utilization of natural energy resources

Course Title: You and Artificial Intelligence

Course Outcomes (CO)

1. Understand AI's fundamental concepts and methods

2. Acquire knowledge of modern AI tools

3. Understand implications of AI for business strategies

Course Title: Robotics

Course Outcomes (CO)

1. Understand the basic components of robotics ,classification of robots and their applications

2. Identify different types of sensors and end reflectors required for specific applications

3. Develop programming algorithms for robot control

M.Sc Electronics

Programme Outcomes (PO)

1. Apply knowledge and skill in the design and development of Electronic circuits to cater to the needs of Electronic Industry.

2. Acquire in-depth knowledge of Electronic devices, Linear and digital electronics, behaviour of linear and non-linear circuits, Hardware description Language, Microprocessors and Microcontrollers in wider and global perspective, with an ability to discriminate, evaluate, analyse, synthesize and integrate for enhancement of knowledge.

3. Acquire knowledge about the recent technologies like embedded systems, VLSI, DSP, and Biomedical Instrumentation and getting hands on experiences so that students can be industry ready.

4. Apply the knowledge to evaluate the problems related to society, health and environment and to provide a sustainable solution.

Electronic Devices

Course Outcomes (CO)

1. Realize crystal lattice structure, crystal growth, energy bands in metals, semiconductors and insulators, and drift of carriers in E and H fields.
2. Explain and realize the operation of different diodes and their applications
3. Understand the working of BJTs with the help of different models.
4. Describe the working of FETs, MOSFETs, MESFETs

Network Analysis and Control Systems

Course Outcomes (CO)

1. Apply Laplace transform to solve the given network. Evaluate for RLC elements/ frequency response related parameters like resonant frequency, quality factor, half power frequencies, voltage across inductor and capacitor, current through the RLC elements, in resonant circuits

2. Solve network problems by applying Superposition/ Reciprocity/ Thevenin‘s/ Norton‘s/ Maximum Power Transfer/ Millmann‘s Network Theorems and electrical laws to reduce circuit complexities and to arrive at feasible solutions. And using specified two port network parameter like Z or Y or T or h.

3. Develop the mathematical model of mechanical and electrical systems

4. Determine the stability of a system in the frequency domain using Nyquist and bode plots

5. Develop a control system model in continuous and discrete time using state variable techniques

Power Electronics

Course Outcomes (CO)

1. Describe the characteristics of different power devices and identify the applications.
2. Determine the output response of a thyristor circuit with various triggering options.
3. Evaluate the response of controlled rectifier with resistive and inductive loads.
4. Illustrate the working of DC-DC converter and inverter circuit.
5. Understand the working principle of ac and DC motors.

Digital Electronics and VHDL programming

Course Outcomes (CO)

1. Develop simplified switching equation using Karnaugh Maps and QuineMcClusky techniques.
2. Design combinational circuits and Synchronous/Asynchronous Counters and Shift registers using Flip Flops.
3. Develop state diagrams for Synchronous Sequential Circuits
4. Analyse noise types and develop noise control methods
5. Write VHDL programs in dataflow, behavioural and structural modelling levels of Abstraction
6. Design and verify the functionality of digital circuit/system using test benches
7. Identify the suitable Abstraction level for a particular digital design.

Signals and Systems

Course Outcomes (CO)

1. Classify signals and systems Determine performance of a system in time-domain given impulse response
2. Analyze Linear Time Invariant (LTI) systems
3. Understand Z transforms and apply it to find the stability of a given system

Python Programming Lab

Course Outcomes (CO)

1. Understand the basics programming concepts of python
2. Develop the skill of designing Graphical user Interfaces in Python
3. Learn to write database applications in Python.
4. Understand a range of Object-Oriented Programming, as well as in-depth data and information processing techniques

Embedded Systems and PIC microcontroller

Course Outcomes (CO)

1. Write assembly level language programmes
2. Write programs using embedded C language
3. Import the programs onto the microcontroller board
4. Debug a program on a target device and embed the code in flash memory for stand-alone system for embedded system designs

Advanced Communication

Course Outcomes (CO)

1. Understand different digital modulation techniques
2. Analyse base band transmission and its applications
3. Design of various M-ary signalling schemes
4. Design and implement error detection and correction encoders and decoders.
5. Analyse the spread spectrum modulation techniques

Electronic Instrumentation and Biomedical Instrumentation

Course Outcomes (CO)

1. Learn the concept of MEMS and materials
2. Familiarize with different data acquisition systems
3. Understand human physiology and electric signals related to it.
4. Learn the various medical equipment and their technical aspects
5. Understand, design and evaluate systems and devices that can measure, test and/or acquire biological information from the human body.

MEMS and Microsystems

Course Outcomes (CO)

1. Select appropriate transducer for the given application
2. Understand the working of various sensors and actuators used in MEM
3. Understand fabrication of microsystems
4. Analyse the concepts of micromachining technologies.
5. Describe various design considerations of Microsystems
6. Understand the concepts of MEMS designing and packaging.

Optical Fiber Communication

Course Outcomes (CO)

1. Analyze the propagation of information through optical fibers
2. Analyze different types of losses in the transmission
3. Understand the applications of Digital and Analog links

VLSI Design and Systems

Course Outcomes (CO)

1. Demonstrate understanding of MOS transistor theory, CMOS fabrication flow and technology scaling
2. Apply the knowledge of CMOS technology to construct basic and advanced CMOS logic circuit like memory & array subsystems
3. Understand the design process of **MOS and BiCMOS circuit**
4. Demonstrate knowledge of FPGA based system design Interpret testing and testability issues in VLSI Design.
5. Design CMOS based combinational and sequential circuits for given specification.

Digital Signal Processing

Course Outcomes (CO)

1. Analyze the response of LTI systems using time domain and DFT techniques.
2. Compute DFT of real and complex discrete time signals.
3. Computation of DFT using FFT algorithms and linear filtering approach.
4. Solve problems on digital filter design and realize using digital computations with MATLAB and DSP Kits.

Nanoelectronics

Course Outcomes (CO)

1. Realizes the importance of nanoscaling and how it's useful for Nanoelectronics era.
2. Connect the similarities and differences from classical devices to non- classical devices.
3. Understand the instrumentation and characterization techniques
4. Understand the under laying physical process in Short channel effects.
5. Develop the ability to conduct research on advanced semiconductor devices, emerging technologies, and organic electronics.

Machine Learning

Course Outcomes (CO)

1. Understand the probability and statistical concepts
2. Infer the concept of correlation and regression for relating two or more related variables
3. Evaluate models generated from data
4. Appreciate the underlying relationships within and across Machine Learning algorithms and the paradigms of supervised and un-supervised learning.
5. Understanding a wide variety of learning algorithms

ARM Processor Lab

Course Outcomes (CO)

1. Understand the working of ARM processor and its features.
2. Apply all the concepts and develop a minor project using Raspberry pi.

Microwaves and Antenna Theory

Course Outcomes (CO)

1. Apply the concepts of static Electric & Magnetic fields to study Time-varying electro-magnetic field.
2. Analyze various parameters related to microwave transmission lines and waveguides
3. Analyze various antenna and their parameters necessary for building an RF system
4. Recommend various antenna configurations according to the applications

Digital Image Processing

Course Outcomes (CO)

1. Review the fundamental concepts of a digital image processing system.
2. Analyze images in the frequency domain using various transforms.
3. Evaluate the techniques for image enhancement and image restoration
4. Categorize various compression techniques.
5. Interpret Image compression standards.
6. Interpret image segmentation and representation techniques.

Embedded System Design

Course Outcomes (CO)

1. Understand the basics of real time concepts and survey of software architecture.
2. Analyze the embedded OS functionality and study the basic design using RTOS
3. Design embedded applications using given specifications and concepts of development process.
4. Demonstrate practical experiments on developing embedded systems.