Rayat Shikshan Sanstha's

Annasaheb Awate Arts, Commerce & Hutatma Babu Genu Science College

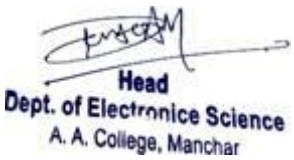
Manchar, Tal. Ambegaon, Dist.Pune 410503

Programme: B.Sc., Electronic Science

Course Outcomes

CONo.	Course Outcomes After completing B.Sc. degree programme, the students will be able to:
Class: FYBSc : SEM I	
Paper I: ELS-101T Fundamentals of Analog Electronics	
CO 1	Identify basic Component and systems used in analog circuits
CO 2	Explain fundamental laws and elements of electrical circuits
CO 3	Understand DC circuit theorems and networks
CO 4	Understand AC circuits and related terminologies with examples
ELS-102-PPractical Course-I	
CO 1	Understand how to identify electronic components
CO 2	Understand DC circuit theorems and networks
CO 3	Understand AC circuits and related terminologies with examples
OE -101- ELSBasics of Computer Hardware	
CO 1	Understand computer system and its operations.
CO 2	Enhance the knowledge of different devices used in the computer with respect to their applications
CO 3	Understand the use of system software and applications software.
CO 4	Able to troubleshoot the computer hardware or software problems.
SEC 101 ELElectronic Circuit Building and Testing	
CO 1	Understand how to identify, use and construct electronic circuits with circuit elements
CO 2	Develop skill of assembling simple electronic circuits
CO 3	Test assembled electronic circuit
Class: FYBSc : SEM II	
ELS-151-TFundamentals of Digital Electronics	
CO 1	Solve problems based on inter-conversion of number systems.
CO 2	Understand different logic gates
CO 3	Understand the working principle and application of different arithmetic circuits
CO 4	Understand types of digital circuits.

ELS-152-PPractical Course-II	
CO 1	Understand the different types of logic gates.
CO 2	Understand the difference between sequential and combinational circuits.
CO 3	Understand the different modes of shift registers.
CO 4	Understand the various types of code converters
OE-151-ELSBasics of Computer Hardware Lab	
CO 1	Identify computer hardware parts and connect peripherals
CO 2	Describe function of input and output peripheral devices.
CO 3	Understand the use of different types of storage devises
CO 4	Able to troubleshoot the computer hardware problems.
SEC-151-ELSPCB Designing and Fabrication	
CO 1	To prepare PCB layout for given circuit
CO 2	Use software for creating layout
CO 3	Make PCB and solder components on PCB



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Programme: B.Sc., Electronic Science Course Outcomes

CO No.	Course Outcomes After completing B.Sc. degree programme, the students will be able to:
Class:SYBSc : Sem:III	
ELS-201-MJ:Analog Circuit Design	
CO 1	Recall and explain the general classification of amplifiers.
CO 2	Analyze and perform AC and DC analysis of amplifiers.
CO 3	Identify and compare different multistage amplifier types.
CO 4	Explain the characteristics of Op-Amp.
CO 5	Design and analyze basic Op-Amp circuits.
ELS-202-MJ:Digital Circuit Design	
CO 1	Design and analyze combinational circuits like code converters, adders and encoders.
CO 2	Design synchronous counters using JK and T Flip-Flops.
CO 3	Study and explain the features of ICs 7476 and 7490 for counters.
CO 4	Describe the fundamental logic families such as TTL, CMOS, and ECL, and compare their electrical and performance characteristics.
CO 5	Interface and program switches, keypads, and thumbwheel switches.
CO 6	Apply knowledge of PLDs in designing digital systems for real-world applications.
ELS-203-MJP: Practical Course-III	
CO 1	Design and analyze different types of amplifiers.
CO 2	Study the operation of integrator and differentiator circuits.
CO 3	Design Oscillators and Multivibrators.
CO 4	Design a Butterworth low-pass filter and study its frequency response.
CO 5	Design a 3-bit synchronous up/down counter using JK Flip-Flops.
CO 6	Design and implement counter for given sequence
ELS-221-VSC: Circuit Simulation-I	
CO 1	Basic laws of Analog circuit design.

CO 2	Half-wave and full-wave rectifiers.
CO 3	Single-stage common-emitter amplifier.
CO 4	Op-amp amplifiers, Oscillators and Multivibrators
CO 5	4-bit synchronous counter using flip-flops.
CO 6	Interfacing of various peripherals to digital IC
ELE-241-MN:Instrumentation and Measurement Systems	
CO 1	Explain the working of basic instrumentation systems.
CO 2	Identify and use appropriate sensors for measuring physical quantities.
CO 3	Understand signal processing techniques used in instrumentation.
CO 4	Make use of various instruments.
CO 5	Work with the filters, ADCs and DACs.
CO 6	Design simple measurement systems.
ELE-242-MNP:Lab Course on Instrumentation and Measurement Systems	
CO 1	Explain the working of basic instrumentation systems
CO 2	Identify and use appropriate sensors for measuring physical quantities.
CO 3	Understand signal processing techniques used in instrumentation.
CO 4	Operate lab instruments independently.
CO 5	Make use of sensors to construct a measurement system.
CO 6	Design and test simple measurement systems.
Class:SYBSc : Sem:IV	
ELS-251-MJ: Linear Integrated Circuits	
CO 1	Understand the practical design aspects while using Op- mps.

CO 2	Design and analyze basic application circuits using Linear ICs.
CO 3	Learn the specifications Voltage Regulator IC.
CO 4	Gain knowledge of the pin configuration, internal working, and typical applications of positive and negative voltage regulators.
CO 5	a. Describe and evaluate the performance parameters of the LM565.
CO 6	Understand and apply the concept of FSK demodulation using PLL.
ELS-252-MJ: Microcontroller Programming and Applications	
CO 1	Understand the fundamentals of microcontrollers and differentiate between microcontrollers and embedded processors.
CO 2	Comprehend the architecture, features, and pin configuration of the AVR microcontroller and Arduino.
CO 3	Develop basic Arduino programs using C/C++ and implement control structures, operators, and statements.
CO 4	Implement interfacing of Arduino with various input/output devices such as LEDs, buzzers, sensors, and motors.
CO 5	Design and develop simple IoT-based applications and real-world projects using Arduino and external modules
CO 6	Integrate and program modules to build interactive embedded systems and IoT prototypes.
ELS-253-MJP:Practical Course-IV	
CO 1	Design and build half-wave and full-wave precision rectifiers using Op-Amps for high-precision signal rectification.
CO 2	Design, build, and test fixed and adjustable voltage regulators (e.g., IC 78XX, 79XX, LM317, LM337, LM723).
CO 3	Explain how a PLL locks onto an input frequency and generates a stable output at a multiple of the input
CO 4	Interfacing various input/output devices such as push buttons, sensors, LED and Buzzer with Arduino
CO 5	Interface DC motor, Servo motor and steeper motor with Arduino.
CO 6	Explain how IoT systems collect, transmit, and visualize real-time sensor data over the internet
ELS-271-VSC:Circuit Simulation - II	
CO 1	Understand and implement basic digital output control using Arduino to turn devices ON and
CO 2	Acquire and process analog and digital sensor data using Arduino to read and display sensor data.
CO 3	Use conditional statements in Arduino programming to control output devices.

CO 4	Establish serial communication between Arduino and external devices using a Bluetooth module
SEC-251-ELS: Python Programming for Electronic Science	
CO 1	Understand and apply basic Python syntax, data types, control structures, and input/output operations to solve simple computational problems.
CO 2	Develop problem-solving skills through implementation of mathematical and logical algorithms such as prime checking, factorial, Fibonacci series, and conversions.
CO 3	Design and simulate electronic circuit formulas (Ohm's Law, Power, Resistor Calculator, 555 Timer, PWM) using Python programming
CO 4	Utilize Python to analyze, visualize, and interpret data related to electronics signals and systems (e.g., sine wave plotting, battery backup estimation).
CO 5	Apply structured programming concepts to build reusable and modular solutions such as calculators, data converters, and component analyzers.
ELE-291-MN:Communication Electronics	
CO 1	Understand different blocks in communication systems, types of noise in communication systems and its different parameters
CO 2	Understand need of modulation, modulation process, amplitude modulation, frequency modulation and demodulation methods
CO 3	Describe the operation and applications of TDM and FDM in communication systems and identify their differences.
CO 4	Apply the concept of sampling and the sampling theorem in digital communication.
CO 5	Study the difference between digital Modulation techniques ASK, FSK, PSK as well as PCM and its applications.
CO 6	Describe satellite orbits, transponders, uplink/downlink concepts, and applications of satellite communication in global connectivity.
ELE-292-MNP: Lab Course on Communication Electronics	
CO 1	Understand the design concepts of different types Analog Modulation
CO 2	Understand the design concepts of different types Digital Modulation Techniques
CO 3	Understand the design concepts of different types Pulse Modulation Techniques
CO 4	Study of Various Applications of Communication System
CO 5	Understand the principles of Time Division Multiplexing (TDM) and Frequency Division Multiplexing (FDM)
CO 6	Describe the block diagram and working of an AM and FM broadcasting system

Head
Dept. of Electronics Science
A. A. College, Manchar

CO No.	Course Outcomes After completing B.Sc. degree programme, the students will be able to:
Class: TYBSc : SEM V	
EL 351: Paper I: Digital Design using VERILOG	
CO 1	Know and understand structure of HDL and Verilog.
CO 2	Understand different modeling styles in Verilog.
CO 3	Use Verilog effectively for simulation, verification and synthesis of digital system.
CO 4	Understand basics of programmable logic devices.
EL 352: Paper II: Microcontroller Architecture and Programming	
CO 1	Understand the basics of microcontroller.
CO 2	Acquire basic programming skills in C language.
CO 3	Understand and acquire basic programming skills for AVR microcontroller.
EL 353: Paper III: Analog circuit Design and Applications	
CO 1	Understand basics of analog circuit design.
CO 2	Analyze waveform generators required for testing different circuits.
CO 3	Build application circuits using specialized Ics.
CO 4	Design analog systems using available ICs.
EL 354: Paper IV: Nanoelectronics	
CO 1	Understand basic concepts of nano electronic devices and nano technology.
CO 2	Understand the electron transport mechanism in nanostructures.
CO 3	Understand techniques of characterization of nanostructures.
CO 4	Understand different devices constructed using nanotechnology.
EL 355: Paper V: Signals and Systems	
CO 1	Know basics of electronic signals.
CO 2	Know different types of systems.
CO 3	Analyze systems using Laplace and Fourier analysis.
CO 4	Understand digital signal processing system.

EL 356(A): Paper VI(A): Optics and Fiber Optic Communication	
CO 1	To acquire Knowledge of optical fiber communication system.
CO 2	To understand different parameters of optical fibers.
CO 3	To learn essential optical components of Fiber Optic Communication.
CO 4	To analyze and integrate fiber optical network components in variety of networking schemes.
EL 357: Paper VII: Practical Course I	
CO 1	Analyze different design and test procedures for analog circuits and systems.
CO 2	Measure different parameters of optical fiber communication systems
CO 3	Understand importance of product design and entrepreneurship.
CO 4	Develop electronic systems for given application.
EL 358: Paper VIII: Practical Course II	
CO 1	Develop and simulate design digital systems using Verilog.
CO 2	Design and develop AVR microcontroller based systems.
CO 3	Understand different nanoelectronic devices.
CO 4	Inculcate basic skills required for design and development of embedded Systems.
EL 359: Paper IX: Practical Course III(Project)	
CO 1	Understand basic methodology of selection of topic for project.
CO 2	Understand how to do literature review for selected topic for project.
CO 3	Apply the knowledge for design and development of the selected project.
CO 4	Use different software and hardware for testing, validation and verification ofcircuits for successful outcome of project
CO 5	Understand documentation process in the form of presentation and project report.
CO 6	Understand process of systematic development of electronic system and Development of skills for successful outcome.
ELSEC 351: Paper X: SEC1: Electronic Design Automation Tools	
CO 1	Design the electronics circuits using EDA software tools
CO 2	Simulate various analog and digital circuits using EDA software tools

CO 3	Plot various waveforms.
CO 4	Simulate basic electronic system blocks
ELSEC 352: Paper XI: SEC2: Internet of Things and Applications	
CO 1	Know the basic building blocks of IoT
CO 2	Know IoT protocols
CO 3	Understand how to Design and Develop IoT based system through case studies
Class: T.Y.B.Sc. Semester - VI	
EL 361: Paper I: Modern Communication Systems	
CO 1	Understand the digital modulation techniques.
CO 2	Understand different types of pulse modulation techniques.
CO 3	Describe the evolution and importance of Mobile communication and cellular communication
CO 4	Know the basics of satellite communication systems.
EL 362: Paper II: Embedded System Design using Microcontrollers	
CO 1	Understand features and architecture of PIC microcontroller.
CO 2	Demonstrate how to interface PIC microcontroller with different peripherals
CO 3	Understand features and architecture of ARM microcontroller.
CO 4	Demonstrate embedded system using given microcontroller.
EL 363: Paper III: Industrial Electronics	
CO 1	Understand basics of Passive Electronic Component Manufacturing Processes
CO 2	Understand process involved in PCB manufacture and Modern Circuit Assembly
CO 3	Know about the Semiconductor Device and IC Fabrication Process
EL 366(B): Paper VI (B): Sensors and Systems	
CO 1	Understand basic principles and types of different sensors.
CO 2	Understand basic principles and types of actuators.
CO 3	Know about signal conditioning systems for sensors.
EL 367: Paper VII: Practical Course I	

CO 1	Demonstrate power electronic circuits.
CO 2	Demonstrate different types of digital communication systems.
CO 3	Understand working principles of different power devices and their Character
EL 368: Paper VIII: Practical Course II	
CO 1	Design embedded systems using PIC microcontroller.
CO 2	Design embedded systems using ARM microcontroller.
CO 3	Demonstrate PLC SCADA using ladder programming.
CO 4	Design and develop sensor systems for different applications.
EL 369: Paper IX: Practical Course III(Project)	
CO 1	Understand basic methodology of selection of topic for project.
CO 2	Understand how to do literature review for selected topic for project,
CO 3	Apply the knowledge for design and development of the selected project.
CO 4	Use different software and hardware for testing, validation and verification of circuits for successful outcome of project
CO 5	Understand documentation process in the form of presentation and project report
CO 6	Understand process of systematic development of electronic system and Development of skills for successful outcome.
ELSEC 361: Paper X SEC1: Design of Printed Circuit Boards	
CO 1	Understand basics of PCB.
CO 2	Know about the PCB design technology.
CO 3	Know about different soldering techniques.
ELSEC 362: Paper XI: SEC2: Mobile Application Development	
CO 1	Understand basics of Mobile application development
CO 2	Develop ability to work in android development environment.
CO 3	Design and develop mobile applications.

Head
Dept. of Electronics Science
A. A. College, Manchar