

COs, POs, and PSOs

Department of Electronics science

BACHELOR OF SCIENCE	
PROGRAM: B.Sc. Electronic science	
Program Outcomes	PO1: Critical Thinking: Take informed actions after identifying the assumptions that frame our thinking and actions, checking out the degree to which these assumptions are accurate and valid, and looking at our ideas and decisions (intellectual, organizational, and personal) from different perspectives.
	PO2: Effective Communication: Speak, read, write and listen clearly in person and through electronic media in English and in one Indian language, and make meaning of the world by connecting people, ideas, books, media and technology.
	PO3: Social Interaction: Elicit views of others, mediate disagreements and help reach conclusions in group settings.
	PO4: Effective Citizenship: Demonstrate empathetic social concern and equity centred national development, and the ability to act with an informed awareness of issues and participate in civic life through volunteering.
	PO5: Ethics: Recognize different value systems including your own, understand the moral dimensions of your decisions, and accept responsibility for them.
	PO6: Environment and Sustainability: Understand the issues of environmental contexts and sustainable development.
	PO7: Self-directed and Life-long Learning: Acquire the ability to engage in independent and life-long learning in the broadest context socio-technological change
Program Specific Outcomes	PSO-1: Ability to design and manage electronic systems or processes that conforms to a given specification within ethical and economic constraints Understand skills of various techniques & laboratory safety. Ability to design and conduct electronics experiments, as well as to analyze and interpret data.
	PSO-2: To increase the awareness among the students and faculty about handling precisely the advanced and sophisticated instruments/equipments. To use modern scientific measuring devices, instruments, tools, models and charts. Ability to use techniques, skills and modern technological/scientific/engineering software/tools for professional practices
	PSO-3: Ability to design and conduct electronics experiments, as well as to analyze and interpret data Understanding of basic concepts included in newly designed courses for UG classes. Ability to use techniques, skills and modern technological/scientific/engineering software/tools for professional practices.
	PSO-4: Discuss about ability to function as a member of a multidisciplinary team with sense of ethics, integrity and social responsibility. Ability to use techniques, skills and modern technological/scientific/engineering software/tools for professional practices.
Course Outcomes	
F.Y.B.Sc.(CBCS- 2019) Semester I & II courses	
Electronic Science Course I Course Code: EL111 Course Name: Basics of applied electronics	CO 1: To identify different parameters/functions/specifications of components used in electronic circuits.
	CO 2: To solve problems based on network theorems.
	CO 3: To perform simulations using simulator for analyzing network performance.
	CO 4: Verification.
Electronic Science Course II	CO 1: To analyze performance parameters based on study of characteristics of electronic devices like diode, transistors etc.

Course Code: EL112 Course Name: Electronic Devices and Circuits	CO 2: To choose proper electronic devices as per the need of application.
	CO 3: To perform simulations for designing and analyzing diode/transistor circuits.
	CO 4: To build and test the circuits like street light controller using electronic devices.
Electronic Science Course-III Course Code: EL113 Course Name: Electronics Lab IA Practical I	CO 1: To identify different components and devices as well as their types.
	CO 2: To understand basic parameters associated with each device.
	CO 3: To know operation of different instruments used in the laboratory.
	CO 4: To connect circuit and do required performance analysis.
Electronic Science Course I Course Code: EL121 Course Name: Fundamentals of Digital Electronics	CO 1: To solve problems based on interconversion of number systems.
	CO 2: To reduce the expression using Boolean theorems.
	CO 3: To reduce expressions using K maps in SOP and POS forms.
	CO 4: To understand how to use flip flops to build modulus counter.
Electronic Science Course II Course Code: EL122 Course Name: Analog and Digital device Applications	CO 1: To compare different opamps as per specifications or performance parameters.
	CO 2: To understand opamp circuits and its usefulness in different applications.
	CO 3: To know operating principle of IC 555 in different configurations.
	CO 4: To understand different types of DAC and their performance parameters.
Electronic Science Course- III Course Code: EL123 Course Name: Electronics Lab IB Practical II	CO 1: To connect opamp circuits and analyze the output.
	CO 2: To build application circuits of opamp.
	CO 3: To design the output frequency of IC 555 as astable/monostable multivibrator.
	CO 4: To compare simulated and actual results of given circuit.
Course Outcomes S.Y.B.Sc. (CBCS- 2019) Semester III & IV courses	
EL-231: Paper – I: Communication Electronics	CO1: Understand different blocks in communication systems, types of noise in communication systems and its different parameters
	CO2: Understand need of modulation, modulation process and amplitude modulation and demodulation methods
	CO3: Analyze generation of FM Modulation and demodulation methods and comparison between amplitude and frequency modulation
	CO4: Identify different radio receivers and their performance parameters.
EL-232: Paper- II: Digital Circuit Design	CO1: Distinguish between different logic families based on their performance parameters
	CO2: Analyze basic combinational logic circuits for simple applications
	CO3: Design combinational logic circuits using K maps for identified applications
	CO4: Design Sequential logic circuits using state diagram, excitation table for identified applications
EL-233: Paper- III:	CO1: Describe and explain the techniques of generation of AM/ FM and demodulation

Practical Course: SEMESTER III	CO2: Design FSK generation using standard IC XR 2206 referring data manuals
	CO3: Describe and explain the TDM/ FDM generation technique
	CO4: Demonstrate PPM/PWM/PAM and PCM techniques using standard circuits in data manuals
EL-241: Paper - I: Analog Circuit Design	CO1: Design single/multistage amplifier using transistor and analyze their frequency response base on gain-bandwidth product due to coupling /bypass capacitors
	CO2: Classify and compare different power amplifiers
	CO3: Understand and design push pull amplifier and need of heat sinks
	CO4: Distinguish between Op-amp Feedback circuits based on their configurations
EL-241: Paper - I: Analog Circuit Design	CO1: Design single/multistage amplifier using transistor and analyze their frequency response base on gain-bandwidth product due to coupling /bypass capacitors
	CO2: Classify and compare different power amplifiers
	CO3: Understand and design push pull amplifier and need of heat sinks
	CO4: Distinguish between Op-amp Feedback circuits based on their configurations
EL-242: Paper II: Microcontroller and Python Programming	CO1: Identify the features and architectural details of microcontroller(Ardiuno)
	CO2: Write code/program using open source programming language (Ardiuno) for basic identified applications
	CO3: Understand programming basics of python programming language
	CO4: Understand special features of python programming language such as importing modules, directory, tuples
EL-243: Paper- III: Practical Course: SEMESTER IV	CO1: Describe and explain the design procedure of different types of active filters and analyze its frequency response
	CO2: Demonstrate positive feedback for oscillator circuits using standard ICs
	CO3: Describe and explain design procedure for two stage amplifiers and application circuits
	CO4: Design practical circuits for identified applications
Course Outcomes	
T.Y.B.Sc. (CBCS- 2019) Semester V & VI courses	
Semester Vth courses	
Electronic Science Course I Course Code: EL 351 Course Name: Digital Design using VERILOG	CO 1: To 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.
Electronic Science Course II Course Code: EL 352 Course Name:	CO 1: Understand the basics of microcontroller
	CO 2: Understand and acquire basic of Microcontroller Architecture and Programming
	CO 3: Acquire basic programming skills in C language.

Microcontroller Architecture and Programming	CO 4: Understand and acquire basic programming skills for AVR microcontroller.
Electronic Science Course-III Course Code: EL 353 Course Name: EL 353 Analog circuit Design & 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.
Electronic Science Course-IV Course Code: EL 354 Course Name: EL 354 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.
Electronic Science Course-V Course Code: EL 355 Course Name: EL 355 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
Electronic Science Course-VI Course Code: EL 356(A) Course Name: EL 356(A) Optics & 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.
Discipline Specific Elective Course Course-VII Course Code: EL 357 Course Name: EL 357 Practical Course I	CO 1: Analyze different design & test procedures for analog circuits & 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
Discipline Specific Elective Course Course-VIII Course Code: EL 358 Course Name: EL 358 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 Nanoelectronics devices
	CO 4: Inculcate basic skills required for design and development of embedded Systems.
Discipline Specific Elective Course Course-IX Course Code: EL 359 Course Name: EL 359 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. Also to understand documentation process in the form of presentation of project Report.
	CO 3: Use different software & hardware for testing, validation & verification of circuits for successful outcome of project.
	CO 4: Understand process of systematic development of electronic system and Development of skills for successful outcome
Skill Enhancement Course Course-X Course Code: EL351 Course Name: EL351 SEC1	CO 1: Design the electronics circuits using EDA software tools
	CO 2: Plot various waveforms
	CO 3: Simulate various analog and digital circuits using EDA software tools
	CO 4: Simulate basic electronic system blocks

Electronic Design Automation Tools	
Skill Enhancement Course Course-XI Course Code: EL 352 Course Name: 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 IoT based system.
	CO 4: Understand how to Develop IoT based system through case studies
Course Outcomes T.Y.B.Sc. (CBCS- 2019) Semester VI courses	
Discipline Specific Elective Course Electronic Science Course I Course Code: EL 361 Course Name: Modern Communication Systems	CO 1: Understand the digital modulation techniques
	CO2: 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.
Electronic science Course II Course Code: EL 362 Course Name: 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
Electronic science Course-III Course Code: EL 363 Course Name: Industrial Electronics	CO 1: Understand basics of semiconductor power devices
	CO 2: Analyze basic power electronics circuits and demonstrate applications.
	CO 3: Understand basics of motor control.
	CO 4: Understand basics of Electric Vehicle systems
Electronic science Course-IV Course Code: EL 364 Course Name: Manufacturing Processes for Electronics	CO 1: Understand basics of Passive Electronic Component Manufacturing Processes
	CO 2: Understand basics of Active Electronic Component Manufacturing Processes.
	CO 3: Understand process involved in PCB manufacture and Modern Circuit Assembly
	CO 4: Know about the Semiconductor Device and IC Fabrication Process
Electronic science Course-V Course Code: EL 365 Course Name: Process Control Systems	CO 1: Familiar with different types of sensors and related systems
	CO 2: Know different types of measurement systems
	CO 3: Understand control parameters in process automation
	CO 4: Understand different types of process control systems and their characteristics
Electronic science Course-VI Course Code: EL 366(B) Course Name: Sensors and Systems	CO 1: Understand basic principles of different sensors
	CO 2: Understand basic types of different sensors
	CO 3: Understand basic principles and types of actuators.
	CO 4: Know about signal conditioning systems for sensors
Discipline Specific Elective Course Course-VII Course Code: EL 367	CO 1: Demonstrate power electronic circuits.
	CO 2: Demonstrate different types of digital communication systems
	CO 3: Understand working principles of different power devices
	CO 4: Understand different power devices and their characteristics

Course Name: Practical Course I	
Discipline Specific Elective Course Course-VIII Course Code: EL 368 Course Name: Practical Course II	CO1: Design embedded systems using PIC microcontroller.
	CO2: Design embedded systems using ARM microcontroller.
	CO3: Demonstrate PLC SCADA using ladder programming.
	CO4: Design and develop sensor systems for different applications
Discipline Specific Elective Course Course-IX Course Code: EL 369 Course Name: Practical Course III (Project)	CO1: Understand basic methodology of selection of topic for project.
	CO2: Understand how to do literature review for selected topic for project
	CO3: Apply the knowledge for design and development of the selected project. Understand process of systematic development of electronic system and Development of skills for successful outcome.
	CO4: Use different software and hardware for testing, validation and verification of circuits for successful outcome of project documentation process in the form of presentation and project report
Skill Enhancement Course Course-X Course Code: EL361 Course Name: ELSEC1 Design of Printed Circuit Boards	CO1: Understand basics of PCB.
	CO2: Know about the PCB design technology.
	CO3: Know about different soldering techniques
	CO 4: Simulate basic electronic system blocks& develop PCBs of the same.
Skill Enhancement Course Course-XI Course Code: EL 362 Course Name: ELSEC2 Mobile Application Development	CO1: Understand basics of Mobile application development.
	CO2: Develop ability to work in android development environment.
	CO3: Design and develop mobile applications
	CO 4: Design and develop mobile applications for specific case studies required.




 Principal
PRINCIPAL
 Padmashri Vikhe Patil College
 of Arts, Science & Commerce
 Pravaranagar, Ahmednagar