

Solapur University, Solapur



Program Educational Objectives (PEO's) and Program Outcomes (PO's) for Electronics & Telecommunication Engineering Program.

Program Educational Objectives (PEO'S)

- 1 To prepare students to give good theoretical background with sound practical knowledge, enable them to analyze and solve Electronics and communication Engineering problems by applying basic principles of mathematics, science, and engineering and using modern tools and techniques.
- 2 To make students to test hardware components and software for offering solution to real life situations.
- 3 To inculcate students to be sensitive to ethical, societal and environmental issues while pursuing their professional duties.
- 4 To build strong fundamental knowledge amongst students to pursue higher education, and to enhance research and continue professional development in Electronics, communication and IT industries with attitude for lifelong learning.
- 5 To nurture students with technical and communication skills in order to be able to function on multidisciplinary fields and make them aware of contemporary issues at national and international levels.
- 6 To develop students for team working and managerial skills leading to entrepreneurship and leadership.

Program Outcomes (PO's)

- (a) an ability to apply knowledge of mathematics, science, and engineering,
- (b) an ability to design and conduct experiments, as well as to analyze and interpret data,
- (c) an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability,
- (d) an ability to function on multidisciplinary teams,
- (e) an ability to identify, formulate, and solve engineering problems,
- (f) an understanding of professional and ethical responsibility,
- (g) an ability to communicate effectively,
- (h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context,
- (i) a recognition of the need for, and an ability to engage in life-long learning,
- (j) a knowledge of contemporary issues, and

Program Specific Outcomes (PSOs)

1. Graduates will be able to attain a solid foundation in Electronics and Communication Engineering with an ability to function in multidisciplinary environment.
2. Graduates will be able to use techniques and skills to design, analyze, synthesize, and simulate Electronics and Communication Engineering components and systems.
3. Graduate will be capable of developing programs in Assembly, High level and HDL languages using contemporary tools for software development.

ELECTRONICS AND TELECOMMUNICATION ENGINEERING

S.E.&TC -I

T211. ENGINEERING MATHEMATICS-III

At the end of course, students will be able to

1. Solve higher order linear differential equation related to electrical circuit theory
2. Apply Laplace and inverse Laplace transforms for analysis of simple electrical circuits
3. Express a function in terms of sine's and cosines components so as to model simple periodic functions.
4. Solve problems on Z transform and explain its properties
5. Find the relation between two variables for the given data using regression
6. Sketch and explain various probability distribution functions
7. Solve simultaneous linear equations and nonlinear equations.
8. Solve the problems of Fourier integral and Fourier transform

ET212. ELECTRONIC CIRCUIT ANALYSIS AND DESIGN-I

At the end of course, students will be able to

1. Elaborate working and applications of diode.
2. Analyze and design unregulated power supply using diode
3. Elaborate working and characteristics of BJT.
4. Analyze and design single stage amplifier and multivibrator.
5. Evaluate FET and MOSFET parameters.
6. Explain applications of FET and MOSFET

ET213. NETWORK THEORY AND ANALYSIS

At the end of course, students will be able to

1. Analyze linear circuit with use of different network theorems and analysis methods.
2. Compute two port network parameters and draw equivalent network.
3. Determine transient and steady state response of linear circuits.
4. Design passive filter and attenuator circuits.

Course Outcomes

ET214. DIGITAL TECHNIQUES

At the end of course, students will be able to

1. Design and realize combinational logic circuits using logic gates, MSI circuits and PLDs.
2. Design, implement and analyze asynchronous and synchronous Sequential circuits using flip flops.
3. Apply digital concepts in industrial applications.

ET215. ANALOG COMMUNICATION

At the end of course, students will be able to

1. Describe, analyze and demonstrate Amplitude modulation and demodulation techniques.
2. Describe, analyze and demonstrate frequency modulation and demodulation techniques
3. Apply the theory and solve problems related to noise.
4. Explain and show the significance of sampling theorem.
5. Illustrate the radiation pattern and calculate the beam width of half wave dipole, folded and Yagi-uda antennas
6. Apply MATLAB software for simulation of A.M. and F.M. modulation and demodulation.

ET216. ELECTRONIC SOFTWARE LAB-I

At the end of course, students will be able to

1. Implement arrays and structures.
2. Use string library functions and array of string.
3. Implement dynamic memory allocation.

SE E&TC -II

ET221. ELECTRONIC CIRCUIT ANALYSIS AND DESIGN-II

At the end of course, students will be able to

1. Analyze multistage amplifier.
2. Analyze and design feedback amplifier.
4. Analyze power amplifiers.
5. Analyze and design oscillators.
6. Design and analyze timer circuits using IC 555 and some of its applications.
7. Analyze and design transistorized series voltage regulators.
8. Analyze and design voltage regulator using ICs.

ET222. DATA STRUCTURE

At the end of course, students will be able to

1. Implement stack, queues, and linked list.
2. Use recursion
3. Select non linear structures for autonomous realization of simple programs or program parts
4. Implement different searching and sorting technique

ET223. CONTROL SYSTEMS

At the end of course, students will be able to

1. Explain applications of control system
2. Model the Mechanical and Electrical systems.
3. Solve the problems on system reduction.
4. Compute the stability of system.
5. Plot Bode plot, Root Locus for given system.

Course Outcomes

ET224. LINEAR INTEGRATED CIRCUITS

At the end of course, students will be able to

1. Explain working of op amp and characteristics of ideal and practical op amp
2. Describe frequency response of op amp
3. Design and analyze different linear applications of op amp and understand non-linear applications of op-amp
4. Design first and second order active filter and can analyze waveform generators
2. Describe PLL and its applications.

ET225. SIGNALS AND SYSTEMS

At the end of course, students will be able to

1. Represent different signals and systems mathematically and are able to perform simulation using MATLAB.
2. Model LTI system.
3. Determine system stability using z transform.

ET226. ELECTRONIC SOFTWARE LAB-II

At the end of course, students will be able to

1. Use electronic circuit design software.
2. Use signal processing toolbox for signal processing application.
3. Design PCB using PCB designing software which is the production domain for various small firmwares.

Course Outcomes

TE E&TC-I

ET311. ELECTROMAGNETIC ENGINEERING & RADIATING SYSTEMS

At the end of course, students will be able to

1. Derive wave equation.
2. Apply the fundamentals in Telecommunication Applications.
3. Succeed in different competitive examinations.

ET312. PRINCIPLES OF DIGITAL COMMUNICATION

At the end of course, students will be able to

1. Solve and analyze problems related to entropy coding.
2. Distinguish between pulse and digital modulation techniques.
3. Identify the modulation techniques for different applications.

ET313. SOFTWARE ENGINEERING & PROJECT MANAGEMENT SYSTEM

At the end of course, students will be able to

1. Interpret software processes and their models.
2. Identify different tasks of project managers and need for Project planning in Project completion.
3. Visualize progress of software project.
4. Work in multidisciplinary project as a part of team.

ET314. DIGITAL SIGNAL PROCESSING

At the end of course, students will be able to

1. Apply transform techniques for various applications.
2. Evaluate Discrete Fourier Transform.
3. Design filters for given applications.

Course Outcomes

ET315. MICROPROCESSOR

At the end of course, students will be able to

1. Identify the basic element and functions of microprocessor.
2. Describe the architecture of microprocessor and its peripheral devices.
3. Explain fundamental understanding on the operation between the microprocessor and its interfacing devices.
4. Apply the programming techniques in developing the assembly language program for microprocessor applications.

ET316. ELECTRONIC SOFTWARE LAB – II

At the end of course, students will be able to

1. Analyze simple C++ Program.
2. Implement object oriented programming for data manipulation.
3. Solve problems related to object oriented concepts

TE E&TC-II

ET321. RADAR & MICROWAVE ENGINEERING

At the end of course, students will be able to

1. Calculate parameters and properties of transmission lines.
2. Analyze different parameters of microwave components.
3. Implement the fundamentals in Defense and in Industrial Applications.

ET322. MICROCONTROLLERS AND APPLICATIONS

At the end of course, students will be able to

1. Describe the fundamental features and operation of contemporary microcontroller
2. Identify memory organization of a microcontroller and Illustrate microcontroller memory and peripherals expansion capability
3. Analyze the program for time and code complexity
4. Develop assembly language source code for applications that use I/O ports, timer and single/multiple interrupts



ET323. ELECTRONICS APPLICATIONS & SYSTEM DESIGN

At the end of course, students will be able to

1. Use the power devices in industrial applications.
2. Design and implement timers, frequency counters and digital voltmeters.
3. Design and implement PLL applications.
4. Identify and implement the design aspects for solving industrial problems.

ET324. OPTICAL COMMUNICATION

At the end of course, students will be able to

1. Evaluate various losses in optical fiber communication.
2. Able to select appropriate source and detector for a communication system.
3. Evaluate various parameters of given optical fiber.

ET325. MOBILE COMMUNICATION

At the end of course, students will be able to

1. Interpret how cellular systems work in mobile communication.
2. Identify how many mobile users simultaneously share the given radio spectrum.
3. Analyze how GSM works and also others services like SMS, GPRS, call waiting service etc works.

ET326. MINI PROJECT (HARDWARE)

At the end of course, students will be able to

1. Understand and design PCB technique.
2. Understand and design PCB artwork and fabrication techniques.
3. Design, implement, analyze, and test Hardware mini project.

ET327. SELF LEARNING MODULE -II

A. COMPUTER ORGANIZATION (SELF LEARNING)

At the end of course, students will be able to

1. Describe processor architectures.
2. Implement basic programs.
3. Analyze memory and I/O systems.

B. OPERATING SYSTEM (SELF LEARNING)

At the end of course, students will be able to

1. Explain the objective and functions of modern operating systems.
2. Describe how computing resources are used by application software in an operating system.
3. Analyze the common algorithms used for various tasks in operating systems.

C. ROBOTICS (SELF LEARNING)

At the end of course, students will be able to

1. Solve problems in implementing efficient robots.
2. Use various sensors and controllers to design a robot.
3. Demonstrate and implement robotic vision based application.

Course Outcomes

B.E.E&TC – I

ET411. COMPUTER COMMUNICATION NETWORK

At the end of course, students will be able to

1. Describe computer communication networks.
2. Differentiate the various types of network configurations.
3. Identify and describe network devices and standards.
4. Explain local area networks, internet, protocols and applications.

ET412. VLSI DESIGN

At the end of course, students will be able to

1. Use EDA Tools for logic system design.
2. Design, implement and analyze combinational and sequential logic circuits.
3. Design combinational logic using CMOS logic.
4. Implement real time applications on commercially available devices.

ET413. SATELLITE COMMUNICATION

At the end of course, students will be able to

1. explain basics of satellite communication
2. State various aspects related to satellite system.
3. Solve problems related to orbital mechanism, link budget design.

ET414. CODING THEORY

At the end of course, students will be able to

1. Solve problems in coding techniques
2. Analyze and design coder and decoder for linear block code, cyclic codes.

Course Outcomes

ET415. ELECTIVE-I

A. IMAGE PROCESSING

At the end of course, students will be able to

1. Describe applications of digital image processing.
2. Apply mathematical tools for processing images.
3. Enhance images using time and frequency domain enhancement techniques
4. Analyze the images
5. Describe various image compression techniques

A. ADVANCED TELECOMMUNICATION NETWORK

At the end of course, students will be able to

1. Identify and describe different standards of wireless Network Technology.
2. Differentiate the various network Architecture.
3. Explain applications of Telecommunication Network.
4. Understand different implementation scenarios and issues.

B. ADVANCE DSP

At the end of course, students will be able to

1. Apply basics of DSP and wavelet transform
2. Design and implementation of practical sampling convertors
3. Analyze adaptive filters
4. Use types of spectrum estimation

ET416. Seminar & Project

At the end of course, students will be able to

1. Select a project after thorough literature survey which is satisfying societal and environmental needs that helps to sustainable development.
2. Prepare a plan for realization of project and calculate approximate budget of the project
3. Apply engineering knowledge and can design hardware and software architecture of the project.

Course Outcomes

4. Student communicates effectively to the society through seminar, synopsis.
5. Student demonstrates presentation skills.

ET417. Vocational Training

At the end of course, students will be able to

1. Student gets exposure to industrial environment and practices and undertakes suitable project based on the learning in vocational training and successfully completes it.
2. write vocational training report
3. Student demonstrates presentation skills
4. use programming / simulation software and presentation tools

B.E.E&TC –II

ET421. BROAD BAND COMMUNICATION

At the end of course, students will be able to

1. Explain the concept of ISDN ,BISDN and ATM
2. Distinguish between pros and cons of ISDN and BISDN services

ET422. MULTIMEDIA COMMUNICATION TECHNIQUES

At the end of course, students will be able to

1. Understand the concept of disc.
2. Become familiar with the components of colour TV.
3. Develop the ability to analyze the applications of Multimedia and identify various communication modes and media types used in Multimedia.
4. Gain the ability to apply engineering tools necessary for engineering practice.

Course Outcomes

ET423. EMBEDDED SYSTEMS

At the end of course, students will be able to

1. Design, execution and evaluation of experiments on embedded platforms
2. Analysis, design and testing of systems that include both hardware and software.

ET424. ELECTIVE-II

A. WIRELESS SENSOR NETWORKS

At the end of course, students will be able to

1. Know Wireless Sensor scenario with its challenges, architecture and protocols.
2. Apply their knowledge for the implementation of the Wireless Sensor Network in the health and rural environment applications.
3. Use of Wireless Sensor scenario with proper Electromagnetic Compatibility conditions.

B. PATTERN RECOGNITION

At the end of course, students will be able to

1. Implement various pattern recognition tasks & techniques
2. Apply the basic knowledge about neural network & Fuzzy technique
3. Knowledge about unsupervised learning and clustering concepts & case studies

C. DSP PROCESSOR AND APPLICATION

At the end of course, students will be able to

1. Apply mathematical fundamentals to DSP Processors
2. Use fundamentals of Programmable DSP Processors for different applications
3. Write Assembly language programs for DSP Processors
4. Knowledgeable in the architecture and programming of TMS320C5X, TMS320C3X Processors for real time applications

Course Outcomes

ET425. Project

At the end of course, students will be able to

1. Apply design concepts for realization of project.
2. Plan for management and financial aspects of the project
3. Demonstrate leadership and team working behavioral skills and function effectively in multidisciplinary fields.
4. Communicate effectively to the society through project and project reports.
5. Demonstrate presentation skills.
6. Use programming / simulation software and presentation, word processing software at various stages of project

