

St. Xavier's Catholic College of Engineering, Chunkankadai, Nagercoil - 629003.

2020 -- 2021

Course Outcomes

Program:B.E. Electronics and Communication Engg. (Sec-A)

Semester:1

<p style="text-align: center;">Course:Physics and Chemistry Laboratory-[BS8161]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Determine different moduli of elasticity used in day to day engineering applications</p> <p>CO2 : Estimate the optical parameters of visible and laser sources along with their applications in various fields</p> <p>CO3 : Calculate the band gap of semiconducting materials.</p> <p>CO4 : Determine the water quality parameters(DO, Chloride, Cu content, Alkalinity and hardness) of the given water sample Analyse quantitatively the metals (Fe, Na, Cu) in the given sample using potentiometer,</p> <p>CO5 : flame photometer and Understand how conductometric titrations are better than volumetric titrations and the skill to do the experiment.</p>
<p style="text-align: center;">Course:Engineering Chemistry-[CY8151]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Describe the methods of water purification</p> <p>CO2 : Define the terms in phase rule and adsorption</p> <p>CO3 : Explain the types of Energy resources</p> <p>CO4 : Determine the composition and characteristics of fuels and alloys</p> <p>CO5 : Classify the types of water,fuels and alloys</p>
<p style="text-align: center;">Course:Problem Solving and Python Programming-[GE8151]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 :Describe the concepts of algorithm, data types, operators, conditional statements and files.</p> <p>CO2 :Write and execute simple Python programs.</p> <p>CO3 :Develop Python programs for complex problems.</p> <p>CO4 :Apply basic and compound data types, functions and files to implement Python programs</p> <p>CO5 :Design and analyse algorithms, modules and packages.</p>
<p style="text-align: center;">Course:Engineering Graphics-[GE8152]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Understand the existing national standards related to engineering drawings</p> <p>CO2 : Understand the given Engineering drawing and interpret a given three dimensional drawing</p> <p>CO3 : Apply the fundamentals and standards in engineering drawing through drafting exercises of geometrical solids</p> <p>CO4 : Identify methods of surface development for different solids and understand some of the hidden geometry of the cut object</p> <p>CO5 : Analyse the three dimensional view of objects as perceived by the human eye</p>
<p style="text-align: center;">Course:Problem Solving and Python Programming Laboratory-[GE8161]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Write, test and debug simple Python Programs</p> <p>CO2 : Implement Python Programs with conditionals and looping statements</p>

CO3 : Develop Python Programs using functions CO4 : Use Python lists,tuples ,dictionaries for representing compound data CO5 : Read and write data from/to files and write programs using python packages
Course:Communicative English-[HS8151]
Upon completion of the course, the students will.../ will be able to...
CO1 : Learn vocabulary,skim and scan passages and share information related to one /oneself /family and friends. CO2 : Improve their telephonic conversation skills,general reading and free writing skills and language skills through preposition and conjunction CO3 : Acquire language skills through degrees of comparison , pronouns and direct /indirect questions comprehend short and long passages ,describe products and express opinions CO4 : Improve their language skills through reading ,draft e-mails and personal letters and use correct tenses in the language usage CO5 : Write short essays and dialogues and participate in group activities
Course:Engineering Mathematics - I-[MA8151]
Upon completion of the course, the students will.../ will be able to...
CO1 : Explain the representation of a function, limit and continuity of a function. CO2 : Describe the techniques of differentiation, partial differentiation, integration and D.E. CO3 : Solve maxima and minima of one variable and two variables CO4 : Compute proper integral, improper integral and multiple integrals. CO5 : Apply various techniques in solving differential equations.
Course:Engineering Physics-[PH8151]
Upon completion of the course, the students will.../ will be able to...
CO1 : Describe the basics of Properties of matter, Waves, Laser, Optical fibers and Thermal behavior of materials to improve their engineering knowledge. CO2 : mention the Advanced Physics concepts of quantum theory and the Characteristics of crystalline materials CO3 : illustrate Bending of beams, Oscillations, Thermal expansion joints and Fiber optic sensors to assess societal and safety issues. CO4 : summarize the Types of optical fibers and losses associated with them, Wave equations, Crystal growth techniques and imperfections of crystals. determine the Moduli of elasticity of different materials, Eigen value and Eigen function CO5 : of particles, Working of thermal devices and Functioning of Scanning Tunneling Microscope to enhance the development of society.

Semester:2

Course:Basic Electrical and Instrumentation Engineering-[BE8254]
Upon completion of the course, the students will.../ will be able to...
CO1 : Outline three phase electrical circuits and its power measurement CO2 : Analyze the circuit model of Transformers CO3 : Interpret the construction and working principle of DC machines CO4 : Interpret the construction and working principle of AC machines CO5 : Compare and contrast different types of measuring instruments

Course:Circuit Analysis-[EC8251]

Upon completion of the course, the students will.../ will be able to...

CO1 : Analyze DC and AC electrical circuits, apply the circuit theorems

CO2 : Analyze about resonance and coupled circuits

CO3 : Analyze the transient and steady state response of the circuits subjected to step and sinusoidal excitations

CO4 : Compare the two port network parameter

Course:Electronic Devices-[EC8252]

Upon completion of the course, the students will.../ will be able to...

CO1 : Explain the construction and operation of diode, transistor, FET, thyristors and display devices.

CO2 : Understand the characteristics of diode, transistor and FET to operate these devices.

CO3 : Understand the characteristics of metal-semiconductor diode and FET, heavily doped diodes, power and display devices.

CO4 : Solve problems on the functioning of diode, transistor, FET and other basic electronic devices.

CO5 : Analyze the transistor and other basic electronic devices with its operation and equivalent models.

Course:Engineering Practices Laboratory-[GE8261]

Upon completion of the course, the students will.../ will be able to...

CO1 : Understand wiring procedures practically

CO2 : Understand all the fundamental concepts involving electrical Engineering

CO3 : Handle basic electrical and electronics equipments

CO4 : Understand all the fundamental concepts involving Electronics Engineering

CO5 : Assemble basic electronic Components

Course:Technical English-[HS8251]

Upon completion of the course, the students will.../ will be able to...

CO1 : Read technical texts and write area specific texts effortlessly

CO2 : Listen and comprehend lectures and talks in their area of specialization successfully

CO3 : Speak appropriately and effectively in varied formal and informal contexts

CO4 : Write reports and winning job applications

CO5 : participate in group discussions

Course:Physics for Electronics Engineering-[PH8253]

Upon completion of the course, the students will.../ will be able to...

CO1 : Mention the electron transport properties of conductors, basic principles of semiconductors, magnetic and dielectric properties of materials

CO2 : Describe the optical properties of materials and principles of nano devices

CO3 : Summarize the classical and quantum concepts of conducting materials, Physics of semiconducting devices and magnetic principles used in electronics devices

CO4 : Illustrate the functioning of various optoelectronic and nano devices

CO5 : Demonstrate the applications of semiconductor, magnetic, dielectric, optical and quantum devices in engineering field

Course:Engineering Mathematics II-[MA8251]

Upon completion of the course, the students will.../ will be able to...

CO1 : Define the basic concepts of matrices, vectors, analytic function and Laplace transform

CO2 : Explain the properties of matrices and vector differential operators

- CO3 : Understand the basics of Laplace transform for elementary functions and line integral of analytic functions
- CO4 : Apply diagonalization of matrices in quadratic form and Laplace transform in differential equations
- CO5 : Evaluate analytic function, vector and complex integration using various methods

Course:Circuit and Devices Laboratory-[EC8261]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Understand the characteristics of clipper, clamper and FWR
- CO2 : Analyze the characteristics of basic electronic devices
- CO3 : Justify Thevinin, Norton theorem, KVL & KCL, and Super Position Theorems
- CO4 : Design RL and RC circuits

Semester:3

Course:Electronic Circuits- I-[EC8351]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Understands the method of biasing transistors
- CO2 : Analyze BJT amplifiers
- CO3 : Analyze single stage and multistage amplifier circuits
- CO4 : Analyze frequency response of amplifiers
- CO5 : Design of regulated power supplies

Course:Signals and Systems-[EC8352]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Illustrate the properties of signals and systems.
- CO2 : Apply Fourier series, Fourier Transform and Laplace transform for continuous time signals and systems.
- CO3 : Analyze continuous time LTI system using Fourier and Laplace transforms.
- CO4 : Characterize the effects of discrete time signals using DTFT and Z-transform.
- CO5 : Design recursive and non-recursive discrete and continuous time systems.

Course:Fundamentals of Data Structures in C Laboratory-[EC8381]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Develop C programs for simple applications making use of basic constructs
- CO2 : Apply basic data structure for a given problem using C
- CO3 : Implement linear and non linear data structures using C
- CO4 : Implement functions and recursive functions in C
- CO5 : Choose appropriate searching, sorting, and hashing algorithm for an application and implement it in a modularized way

Course:Control Systems Engineering-[EC8391]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Identify the various control system components and their representations.
- CO2 : Analyse the various time domain parameters.
- CO3 : Analysis the various frequency response plots and its system.
- CO4 : Apply the concepts of various system stability criterions.
- CO5 : Design various transfer functions of digital control system using state variable models.

Course:Digital Electronics-[EC8392]

<p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : practice digital electronics in the present contemporary world.</p> <p>CO2 : Design various combinational digital circuits using logic gates.</p> <p>CO3 : the analysis and design procedures for Synchronous and Asynchronous Sequential Circuits.</p> <p>CO4 : practice the semiconductor memories and related technology.</p> <p>CO5 : practice electronic circuits involved in the design of logic gates.</p>
<p>Course:Fundamentals of Data Structures In C-[EC8393]</p>
<p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Learn the basic features of C</p> <p>CO2 : Differentiate various programming structures like structure ,union and array</p> <p>CO3 : Explore the applications of linear data structures</p> <p>CO4 : Explore the applications of non-linear and graph data structures</p> <p>CO5 : Understand the basic sorting and searching algorithm.</p>
<p>Course:Interpersonal Skills/Listening &Speaking-[HS8381]</p>
<p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Listen and Respond Appropriately.</p> <p>CO2 : Participate in Group Discussion</p> <p>CO3 : Make Effective Presentation</p> <p>CO4 : Speak clearly with proper stress and intonation.</p> <p>CO5 : Participate confidently and appropriately in conversations both formal and informal.</p>
<p>Course:Linear Algebra and Partial Differential Equations-[MA8352]</p>
<p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : define linear combinations, null spaces and ranges, inner product, linear and non-linear equations, Fourier series</p> <p>CO2 : understand the fundamental concepts of vector spaces, linear transformation and inner product</p> <p>CO3 : Classify the PDEs and explain the Fourier series apply computational techniques and algebraic skills essential for the study of systems of</p> <p>CO4 : linear equations, matrix algebra, vector spaces, eigenvalues and eigenvectors, norms, orthogonalization and diagonalizability</p> <p>CO5 : solve various types of partial differential equations and apply Fourier series in wave equations and heat equations</p>
<p>Course:Analog and Digital Circuits Laboratory-[EC8361]</p>
<p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Analyze the frequency response of BJT/FET Amplifiers</p> <p>CO2 : Simulate and analyze amplifier circuit using SPICE</p> <p>CO3 : Measure CMRR in differential amplifier</p> <p>CO4 : Design regulated power supplies</p> <p>CO5 : Design BJT/JFET amplifiers</p> <p>CO6 : Design and test digital logic circuits</p>

Semester:4

<p style="text-align: center;">Course:Electromagnetic Fields-[EC8451]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Solve simple problems requiring estimation of electric and magnetic field quantities based on these concepts and laws</p> <p>CO2 : Analyze field potentials due to static changes and static magnetic fields.</p> <p>CO3 : Interpret the materials affect electric and magnetic fields.</p> <p>CO4 : Inspect the relation between the fields under time varying situations.</p> <p>CO5 : Discuss the principles of propagation of uniform plane waves.</p>
<p style="text-align: center;">Course:Electronic Circuits II-[EC8452]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Understand feedback concepts and stability.</p> <p>CO2 : Design Oscillator circuits</p> <p>CO3 : Design the tuned amplifiers</p> <p>CO4 : Analyze the wave shaping and Multivibrator circuits</p> <p>CO5 : Design power amplifiers and DC converters</p>
<p style="text-align: center;">Course:Linear Integrated Circuits-[EC8453]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Describe the basic building blocks of linear integrated circuits</p> <p>CO2 : Discuss linear and non-linear applications of operational amplifiers</p> <p>CO3 : Describe the theory and applications of analog multipliers and PLL</p> <p>CO4 : Describe theory of ADC and DAC</p> <p>CO5 : Explain the concepts of waveform generation and introduce some special function ICs</p>
<p style="text-align: center;">Course:Linear Integrated Circuits Laboratory-[EC8462]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Design amplifiers, oscillators, D-A converters using operational amplifiers</p> <p>CO2 : Design filters using op-amp and performs an experiment on frequency response</p> <p>CO3 : Analyze the working of PLL and describe its application as a frequency multiplier</p> <p>CO4 : Design DC power supply using ICs</p> <p>CO5 : Analyze the performance of filters, multivibrators, A/D converter and analog multiplier using SPICE</p>
<p style="text-align: center;">Course:Communication Theory-[EC8491]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : To introduce the concepts of various amplitude modulations and demodulation and their spectral characteristics.</p> <p>CO2 : To introduce the concepts of various angle modulations and demodulation and their spectral characteristics.</p> <p>CO3 : To understand the properties of random process.</p> <p>CO4 : To know the effect of noise on communication systems</p> <p>CO5 : To gain knowledge in sampling and quantization.</p>
<p style="text-align: center;">Course:Environmental Science and Engineering-[GE8291]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Outline the importance of environmental education and ecosystem</p> <p>CO2 : Explain the environmental pollution and its prevention</p> <p>CO3 : Discuss the conservation of natural resources</p>

CO4 : Categorize the social and environmental problems
CO5 : Summarize the need to control population for sustainable development
Course:Probability and Random Processes-[MA8451]
Upon completion of the course, the students will.../ will be able to...
CO1 : Know the necessary basic concepts in probability and random processes Understand the concept of probability used in Baye's theorem, one and two dimensional
CO2 : random variables and introduce some standard distributions applicable to engineering which can describe real life phenomenon
CO3 : Understand the concepts of random processes, spectral densities and linear systems which are widely used in IT fields
CO4 : Apply the concept of probability, correlation and spectral densities in communication engineering
CO5 : Apply random processes and linear systems with random inputs in communication engineering
Course:Circuits Design and Simulation Laboratory-[EC8461]
Upon completion of the course, the students will.../ will be able to...
CO1 : Analyze various types of feedback amplifiers
CO2 : Design Oscillators,Tuned Amplifiers
CO3 : Design wave-shaping circuits.
CO4 : Design multi vibrators
CO5 : Design and simulate feedback amplifiers, oscillators, tuned amplifiers, wave-shaping circuits and multivibrators using PSPICE
Course:Communication Theory-[EC8491]
Upon completion of the course, the students will.../ will be able to...
CO1 : To introduce the concepts of various amplitude modulations and demodulation and their spectral characteristics.
CO2 : To introduce the concepts of various angle modulations and demodulationand their spectral characteristics.
CO3 : To understand the properties of random process.
CO4 : To know the effect of noise on communication systems
CO5 : To gain knowledge in sampling and quantization.

Semester:5

Course:Digital Communication-[EC8501]
Upon completion of the course, the students will.../ will be able to...
CO1 : Explain the principles of information source &discrete memoryless channels.
CO2 : Explain the various waveform coding schemes
CO3 : Design and implement base band transmission & reception schemes.
CO4 : Analyze the spectral characteristics of band pass signaling schemes and their noise performance.
CO5 : Design error control coding schemes
Course:Communication Networks-[EC8551]
Upon completion of the course, the students will.../ will be able to...
CO1 : Choose the components needed to build a network

CO2 : Infer the network functionality into layers
CO3 : Outline the functionality of each layer of the network
CO4 : Identify solution for each functionality at each layer.
CO5 : Examine the node to node communication in the network.
Course:Computer Architecture and Organization-[EC8552]
Upon completion of the course, the students will.../ will be able to...
CO1 : Describe data representation, instruction formats and the operation of a digital computer
CO2 : Explain the concept of various memories, interfacing and organization of multiple processors
CO3 : Illustrate the fixed point and floating-point arithmetic for ALU operation.
CO4 : Discuss about implementation schemes of control unit and pipeline performance
CO5 : Discuss parallel processing technique and unconventional architectures
Course:Discrete-Time Signal Processing-[EC8553]
Upon completion of the course, the students will.../ will be able to...
CO1 : Describe the concepts of DFT and apply it for linear filtering
CO2 : Explain the characteristics of IIR filter and design.
CO3 : Explain the characteristics of FIR filter and design.
CO4 : Summarize finite word length effects and solve the related problems.
CO5 : Implement digital systems using digital signal processor
Course:Digital Signal Processing Laboratory-[EC8562]
Upon completion of the course, the students will.../ will be able to...
CO1 : Carryout basic signal processing operations
CO2 : Demonstrate their abilities towards MATLAB based implementation of various DSP systems
CO3 : Analyze the architecture of a DSP Processor
CO4 : Design and Implement the FIR and IIR Filters in DSP Processor for performing filtering operation over real-time signals
CO5 : Design a DSP system for various applications of DSP
Course:Communication Networks Laboratory-[EC8563]
Upon completion of the course, the students will.../ will be able to...
CO1 : Communicate between two desktop computers
CO2 : Implement the different protocols
CO3 : Program using Sockets
CO4 : Implement and Compare the various Routing Algorithms
CO5 : Use the Simulation tool
Course:Total Quality Management-[GE8077]
Upon completion of the course, the students will.../ will be able to...
CO1 : Understand the Dimensions, Contributions and Barriers regarding Quality
CO2 : Analyze the Principles of TQM
CO3 : Analyze utilization for Quality improvement
CO4 : Apply various types of Techniques used to measure Quality
CO5 : Evaluate Various Quality Systems in manufacturing and service sectors
Course:Basic of Biomedical Instrumentation-[OMD551]
Upon completion of the course, the students will.../ will be able to...

CO1 : Understand bio potential generation and its propagation
CO2 : Determine bio signal characteristics and electrode placement for physiological recording
CO3 : Understand the concepts of bio amplifier for physiological recording
CO4 : Understand measurement techniques for non-electrical physiological parameters
CO5 : Understand different biochemical measurement techniques.
Course: Communication System Laboratory-[EC8561]
Upon completion of the course, the students will.../ will be able to...
CO1 : Simulate and validate the various functional modules of a communication system
CO2 : Demonstrate their knowledge in base band signaling schemes through implementation of digital modulation schemes
CO3 : Apply various channel coding schemes
CO4 : Demonstrate their capabilities towards the improvement of the noise performance of communication system
CO5 : Simulate end-to-end communication Link

Semester:6

Course: VLSI Design-[EC8095]
Upon completion of the course, the students will.../ will be able to...
CO1 : Explain the concepts to realize digital building blocks using MOS transistor
CO2 : Design combinational MOS circuits and power strategies
CO3 : Design and construct Sequential Circuits and Timing systems
CO4 : Design arithmetic building blocks and memory subsystems
CO5 : Implement FPGA design flow and testing.
Course: Transmission Lines and RF Systems-[EC8651]
Upon completion of the course, the students will.../ will be able to...
CO1 : Explain the propagation of signals through transmission lines.
CO2 : Analyze the signal propagation at Radio frequencies.
CO3 : Analyze impedance matching by stubs using Smith chart.
CO4 : Analyze the RF propagation and their characteristics in Waveguide.
CO5 : Design a RF transceiver system for wireless communication.
Course: Microprocessors and Microcontroller-[EC8691]
Upon completion of the course, the students will.../ will be able to...
CO1 : Explain the architecture and programs based on 8086 microprocessor
CO2 : Describe the Memory Interfacing circuits of 8086 microprocessor
CO3 : Interface Input/output circuits with 8086 microprocessor
CO4 : Realize architecture and programming language of 8051 microcontroller.
CO5 : Design 8051 microcontroller based systems
Course: Professional Communication-[HS8581]
Upon completion of the course, the students will.../ will be able to...
CO1 : Make effective presentation.
CO2 : Participate confidently in Group Discussion.
CO3 : Attend job interviews and be successful in them.
CO4 : Develop adequate Soft Skills required for the work place.
CO5 : Develop a long term career-plan- making career changes.

Course:Principles of Management-[MG8591]

Upon completion of the course, the students will.../ will be able to...

- CO1 : The students can be able to apply management concepts and theories in their field of work.
- CO2 : Able to formulate strategic planning and management decisions in the given situation.
- CO3 : Design an organization structure and apply the functions of human resource management in the given organization.
- CO4 : Apply the communication techniques and motivational theories in directing and leading the employees in the achievement of organizational goal.
- CO5 : Evaluate the control techniques and apply management control techniques.

Course:Wireless Networks-[EC8004]

Upon completion of the course, the students will.../ will be able to...

- CO1 : understand the latest 3G/4G networks and it sarchitecture
- CO2 : Analyze the mobile network layer protocol and routing
- CO3 : Illustrate the 3G network architectures
- CO4 : Discuss the internetworking of WLAN and WWAN standards
- CO5 : Illustrate the 4G network architectures and technologies

Course:Technical Seminar-[EC8611]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Outline the advanced engineering developments
- CO2 : Analyze and present technological developments
- CO3 : Make use of teaching aids such as over head projectors,power point presentation and demonstrative models.
- CO4 : Construct and present technical reports
- CO5 : face the placement interviews

Course:Wireless Communication-[EC8652]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Illustrate the features of wireless channel propagation and different parameters of mobile multipath channels
- CO2 : Apply the principles of mobile communication in design of a cellular system.
- CO3 : Design and implement various signaling schemes for wireless communication in fading channels.
- CO4 : Analyze the performance of different multipath mitigation techniques.
- CO5 : Design and analyze transmit/receive diversity and MIMO systems.

Course:VLSI Design Laboratory-[EC8661]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Write HDL code for basic as well as advanced digital integrated circuit
- CO2 : Import the logic modules into FPGA Boards
- CO3 : Synthesize Place and Route the digital IPs
- CO4 : Design and Simulate Digital & Analog IC Blocks using EDA tools
- CO5 : Extract the layouts of Digital & Analog IC Blocks using EDA tools

Course:Microprocessors and Microcontroller Laboratory-[EC8681]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Explaiin ALP program for fixed and Floating Point and Arithmetic operations
- CO2 : Demonstrate the Interfacing of different Inputs /Outputs with 8086 processor
- CO3 : Generate waveforms using 8086 Microprocessors

CO4 : Perform Programs for arithmetic and logical operation in 8051
CO5 : Analysis the difference between simulator and Emulator

Semester:7

Course:Antennas and Microwave Engineering-[EC8701]

Upon completion of the course, the students will.../ will be able to...

CO1 : Understand the basic principles in antenna and microwave system design
CO2 : Demonstrate antenna array with excitation amplitude
CO3 : Describe passive microwave components and active sources
CO4 : Design various types of antennas, microwave mixer, oscillator and amplifiers

Course:Ad hoc and Wireless Sensor Networks-[EC8702]

Upon completion of the course, the students will.../ will be able to...

CO1 : Explain the Fundamental Concepts, routing protocol and applications of ad hoc networks.
CO2 : Describe the challenges, goals and architecture of wireless Sensor networks.
CO3 : Illustrate the networking concepts and protocols used in wireless Sensor networks.
CO4 : Discuss the security requirements, challenges issues and possible solutions for attacks.
CO5 : Explain the challenges in programming and the platform and tools.

Course:Embedded Laboratory-[EC8711]

Upon completion of the course, the students will.../ will be able to...

CO1 : Write programs in ARM for a specific Application
CO2 : Interface memory and Write programs related to memory operations
CO3 : Interface A/D and D/A convertors with ARM system
CO4 : Analyze the performance of interrupt
CO5 : Write programmes for interfacing keyboard, display, motor and sensor.

Course:Optical Communication-[EC8751]

Upon completion of the course, the students will.../ will be able to...

CO1 : Realize basic elements in optical fibers, different modes and configurations.
CO2 : Analyze the transmission characteristics associated with dispersion and polarization techniques.
CO3 : Design optical sources and detectors with their use in optical communication system.
CO4 : Construct fiber optic receiver systems, measurements and coupling techniques.
CO5 : Design optical communication systems and its networks.

Course:Advanced Communication Laboratory-[EC8761]

Upon completion of the course, the students will.../ will be able to...

CO1 : Analyze the performance of simple optical link by measurement of losses and analyzing the mode characteristics of fiber.
CO2 : Analyze the Eye Pattern, Pulse broadening of optical fiber and the impact on BER.
CO3 : Estimate the Wireless Channel Characteristics and analyze the performance of Wireless Communication System.
CO4 : Understand the intricacies in Microwave System design

Course:Embedded and Real Time Systems-[EC8791]

Upon completion of the course, the students will.../ will be able to...

CO1 : To explain the architecture, RTOS computing platform and design techniques
CO2 : Utilize the concepts of embedded computing platform design.

CO3 : Explain the basic concepts of real time Operating system design.
CO4 : Apply the system design techniques to develop software for embedded systems.
CO5 : Model real-time applications using embedded-system concepts

Course:Disaster Management-[GE8071]

Upon completion of the course, the students will.../ will be able to...
CO1 : Differentiate the types of disasters, causes and their impact on environment and society
CO2 : Assess vulnerability and various methods of risk reduction measures as well as mitigation.
CO3 : Draw the hazard and vulnerability profile of India, Scenarios in the Indian context, Disaster damage assessment and management.

Course:Hospital Management-[OBM752]

Upon completion of the course, the students will.../ will be able to...
CO1 : Explain the principles of Hospital administration
CO2 : Identify the importance of Human resource management
CO3 : List various marketing research techniques
CO4 : Identify Information management systems and its uses
CO5 : Understand safety procedures followed in hospitals

Course:Optical Communication-[EC8751]

Upon completion of the course, the students will.../ will be able to...
CO1 : Realize basic elements in optical fibers, different modes and configurations.
CO2 : Analyze the transmission characteristics associated with dispersion and polarization techniques.
CO3 : Design optical sources and detectors with their use in optical communication system.
CO4 : Construct fiber optic receiver systems, measurements and coupling techniques.
CO5 : Design optical communication systems and its networks.

Semester:8

Course:Satellite Communication-[EC8094]

Upon completion of the course, the students will.../ will be able to...
CO1 : Understand and analyze the satellite orbits
CO2 : Understand the components and functions of space segment
CO3 : Understand and analyze the satellite link design
CO4 : Explain the satellite access and coding methods
CO5 : Understand the applications of satellites

Course:Project Work-[EC8811]

Upon completion of the course, the students will.../ will be able to...
CO1 : Identify challenging practical problems and provide solutions to cope up with present scenario of Electronics and Communication Engineering field.
CO2 : Analyzing the various methodologies and technologies for solving the problem.
CO3 : Apply technical knowledge and project management skills for solving the problem.
CO4 : Design and develop hardware and / or software for their project specific problem.
CO5 : Prepare the project report and give proper explanation during presentation and demonstration.

Course: Professional Ethics in Engineering-[GE8076]
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Upon completion of the course, the students will.../ will be able to...

CO1 : Explain about the morals, Ethics, social and human values

CO2 : Apply Ethics for solving moral issues

CO3 : Apply Ethics in Engineering experimentation

CO4 : Infer the rights and responsibilities of an Engineer in the society

CO5 : Apply Ethics in the society by understanding the global issues

St. Xavier's Catholic College of Engineering, Chunkankadai, Nagercoil - 629003.

2020 -- 2021 ODD Semester

Course Outcomes, CO-PO and CO-PSO Mapping

Program:M.E. Communication Systems

Semester:1

<p style="text-align: center;">Course:Advanced Digital Signal Processing-[AP5152]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Understand the basics of discrete random signal processing.</p> <p>CO2 : Explain various types of linear estimation and prediction.</p> <p>CO3 : Understand the basics of digital filter and recursion algorithm.</p> <p>CO4 : Analyze the various type of adaptive filter.</p> <p>CO5 : Understand the basics of multirate signal processing</p>
<p style="text-align: center;">Course:Real Time Embedded Systems-[CU5092]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Describe the architecture and programming of ARM processor</p> <p>CO2 : Revise computing platform and design analysis.</p> <p>CO3 : Explain the basic concepts of real time Operating system design.</p> <p>CO4 : Describe the concept of Accelerators and embedded networks</p> <p>CO5 : Discuss case studies related to embedded systems</p>
<p style="text-align: center;">Course:Communication Systems Laboratory-[CU5161]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Measure and analyze various transmission line parameters.</p> <p>CO2 : Design Microstrip patch antennas</p> <p>CO3 : Implement the adaptive filtering algorithms</p> <p>CO4 : To generate and detect digital communication signals of various modulation techniques using MATLAB</p> <p>CO5 : Evaluate cellular mobile communication technology and propagation model</p>
<p style="text-align: center;">Course:Advanced Radiation Systems-[CU5191]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Understand antenna radiation concepts</p> <p>CO2 : Understand modern antenna concepts</p> <p>CO3 : Analyze the concept of phased array</p> <p>CO4 : Design aperture antenna</p> <p>CO5 : Design dipole and patch antenna</p>
<p style="text-align: center;">Course:Optical Networks-[CU5192]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Recall the basics of optical networks , transmission and non linear effects in networks.</p> <p>CO2 : Explain Transmission System Engineering and Optical Internets</p> <p>CO3 : Explain SONET/SDH and the Architecture of Optical Transport Networks</p> <p>CO4 : Analyze Network topologies, MPLS and Optical Networks.</p> <p>CO5 : Analyze the protection schemes, VPN and Multiprotocol Lambda Switching</p>
<p style="text-align: center;">Course:Applied Mathematics for Communication Engineers-[MA5154]</p> <p>Upon completion of the course, the students will.../ will be able to...</p> <p>CO1 : Know the various methods to solve system of linear equations</p> <p>CO2 : Conceptualize the principle of optimality, formulation, computational procedure and solution of linear programming</p>

- CO3 : Understand the numerical methods of ordinary differential equations
- CO4 : Computation of probability, random variables and their associated distributions, correlations and regression
- CO5 : Exposing the basic characteristic features of a queuing system and acquire skills in analyzing queuing models

Course:Advanced Digital Communication Techniques-[CU5151]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Designing different detection schemes for reducing BER at the receiver.
- CO2 : Design different equalization techniques in AWGN channel.
- CO3 : Possess knowledge on different block codes in communication system design.
- CO4 : Analyze the communication system using convolution codes.
- CO5 : Analyze the basics of Multicarrier and Multiuser Communications.

Semester:2

Course:Digital Communication Receivers-[CU5071]

Upon completion of the course, the students will.../ will be able to...

- CO1 :Designing different detection schemes for reducing BER at the receiver.
- CO2 :Design different types of receiver for AWGN channel.
- CO3 :Possess knowledge on different types of fading channels in communication system design.
- CO4 :Analyze the communication system using synchronization techniques.
- CO5 :Analyze various adaptive equalization techniques.

Course:Software Defined Radio-[CU5094]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Undertand the existing Software architectures
- CO2 : Analyze RF components
- CO3 : Analyze multi rate signal processing
- CO4 : Design data converters
- CO5 : Design the hardware processors

Course:MIC and RF System Design-[CU5201]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Explain the fundamentals of transceiver architecture
- CO2 : Summarise the RF filter, oscillator, and Mixer
- CO3 : Explain the fabrication of MIC components
- CO4 : Analyze feedback system and power amplifier
- CO5 : Design high frequency amplifiers

Course:Electromagnetic Interference and Compatibility-[CU5292]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Design electronic systems that function without errors or problems related to electromagnetic compatibility
- CO2 : Solve basic electromagnetic compatibility problems
- CO3 : Demonstrate the various EMI mitigation techniques.
- CO4 : Identify standards for EMI/EMC.
- CO5 : Compare EMI test methods with different new methods.

Course:Advanced Wireless Networks-[NC5252]

Upon completion of the course, the students will.../ will be able to...

CO1 : Illustrate the latest 4G networks and LTE
CO2 : Relate the wireless IP architecture and LTE network architecture
CO3 : Illustrate the adaptive link layer and network layer graphs and protocol
CO4 : Understand about the mobility management and cellular network
CO5 : Understand QoS challenges and QoS Attributes and Management of Wireless Networks.
Course: Term Paper Writing and Seminar-[CP5281]
Upon completion of the course, the students will.../ will be able to...
CO1 : Understand the subject and narrow it to a topic.
CO2 : State an objective and collect the relevant bibliography.
CO3 : Understand author's contributions.
CO4 : Understand each paper and prepare an outline.
CO5 : Write a final paper and give a final presentation
Course: RF System Design Laboratory-[CU5211]
Upon completion of the course, the students will.../ will be able to...
CO1 : Apply knowledge to identify a suitable architecture and systematically design an RF system. Comprehensively record and report the measured data, and would be capable of
CO2 : analyzing, interpreting the experimentally measured data and produce the meaningful conclusions.
CO3 : Design and develop microstrip filters
Course: Advanced Wireless Communication Systems-[CU5291]
Upon completion of the course, the students will.../ will be able to...
CO1 : Characterize information theoretic MIMO channels
CO2 : Design a space time receiver for error free transmission
CO3 : Design transceiver structure of Massive MIMO for fading channels
CO4 : Compare architectures of millimeter wave communication
CO5 : Design and implement systems with Software Defined Radio, Cognitive Radio and analyze their performance.

Semester:3

Course: Internet of Things-[CP5292]
Upon completion of the course, the students will.../ will be able to...
CO1 : To understand the fundamentals of Internet of Things
CO2 : To learn about the basics of IOT protocols
CO3 : To build a small low cost embedded system using Raspberry Pi.
CO4 : To apply the concept of Internet of Things in the real world scenario.
Course: Soft Computing Techniques-[MP5092]
Upon completion of the course, the students will.../ will be able to...
CO1 : Describe the basics of artificial neural network, fuzzy logic and genetic algorithm
CO2 : Explain the operation of feed forward and feedback neural networks, fuzzy logic systems and genetic algorithm
CO3 : Apply the concept of neural network, fuzzy logic and genetic algorithm to solve practical problems
CO4 : Model systems using neural network and fuzzy logic
CO5 : Implement neural network, fuzzy systems and genetic algorithm to solve problems

Course:Millimeter Wave Communications-[CU5301]

Upon completion of the course, the students will.../ will be able to...

CO1 : To understand the fundamentals of Millimeter wave Communication.

CO2 : Ability to understand Millimeter devices and circuits.

CO3 : To understand the various components of Millimeter wave Communications system.

CO4 : Knowledge of MIMO technology.

CO5 : Ability to design antenna for Millimeter wave frequencies.

CO6 : Knowledge of Millimeter wave technology.

St. Xavier's Catholic College of Engineering, Chunkankadai, Nagercoil - 629003.

2020 -- 2021 ODD Semester

Course Outcomes, CO-PO and CO-PSO Mapping

Program:M.E. Medical Electronics

Semester:1

Course:Human Anatomy and Physiology-[BM5151]
Upon completion of the course, the students will.../ will be able to...
CO1 : Understand the basics of Human Anatomy and Physiology
CO2 : Describe the muscular and skeletal system in human body
CO3 : Understand the basics of Energy producing system in human body
CO4 : Illustrate the various organs and systems involved in body functions.
CO5 : Make use of the physiological knowledge into biomedical engineering
Course:Bio Signal Processing-[BM5191]
Upon completion of the course, the students will.../ will be able to...
CO1 : Understand the basics of biomedical signals, time, frequency domain analysis, adaptive filters, classifiers and multivariate analysis
CO2 : Derive the time series parameters, frequency spectrum and adaptive filter parameters
CO3 : Apply the time domain and frequency domain analysis for different bio medical signals
CO5 : Implement time scale analysis and multivariate component analysis to store the biosignals
Course:Applied Mathematics for Medical Engineers-[MA5157]
Upon completion of the course, the students will.../ will be able to...
CO1 : understand and apply the concepts of vector space , subspace and linear transformation
CO2 : apply the advanced application of the numerical solution of simultaneous linear equations by direct and indirect methods
CO3 : able to findout the intermediate values using interpolation techniques and also the predicted and corrected values using p-c methods
CO4 : fundamental concepts of linear programming problems, assignment problems and transportation problems
CO5 : the importance of queueing models with different queueing techniques
Course:Medical Ethics and Standards-[MX5091]
Upon completion of the course, the students will.../ will be able to...
CO1 : Demonstrate professional guidelines for the health professions.
CO2 : Demonstrate Public duties and consent
CO3 : Illustrate hospital accreditation standards
CO4 : Interpret hospital safety standards
CO5 : Summarize the medical Equipment Safety Standards
Course:Medical Instrumentation-[MX5101]
Upon completion of the course, the students will.../ will be able to...
CO1 : Recall basic medical terms, physical values and describe the origin of bio-potentials and explain the role of bio-potential electrodes
CO2 : Demonstrate the working of bio-amplifiers, bio-potential signals and their recording.
CO3 : Illustrate methods to measure non-electrical parameters.
CO4 : Identify Measuring techniques used for blood flow and blood cell counting
CO5 : Identify biochemical sensors used for biochemical measurements
Course:Biomedical Equipments-[MX5102]
Upon completion of the course, the students will.../ will be able to...

- CO1 : Describe the working of the pacemaker, pulmonary analyzers and aid equipments and their functions
- CO2 : Gain knowledge on different physiotherapy equipments and electrotherapy equipments
- CO3 : Obtain knowledge on instruments dealing with kidney and bones
- CO4 : Develop measurement systems for sensory parameter measurements
- CO5 : Develop biotelemetry system and analyze special therapeutic equipments available.

Course:Medical Instrumentation Laboratory-[MX5111]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Classify the various recording methods used in medical field
- CO2 : Infer the graphical and imaging applications in biomedical system.
- CO3 : Students acquire knowledge about recording of bioelectric potentials
- CO4 : Students acquire knowledge about various physiological measurements used in medical field.
- CO5 : Measure ECG for different biomedical applications

Semester:2

Course:Applied Medical Image Processing-[BM5291]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Understand image processing concepts for medical images.
- CO2 : Analyze image enhancement and restoration methods.
- CO3 : Apply representation techniques for medical images.
- CO4 : Analyse and quantify biomedical data for Morphology and Segmentation techniques.
- CO5 : Analysis and visualization of medical images of numerous modalities such as PET, MRI, CT, or microscopy.

Course:Rehabilitation Engineering-[BM5391]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Understand the basic concepts and principles of Rehabilitation Engineering
- CO2 : Understand various orthotic & prosthetic devices for upper and lower extremities
- CO3 : To design various types of Wheel Chairs
- CO4 : To understand various assistive technologies for vision & hearing.
- CO5 : Understand the recent developments in the field of Sensory Augmentation and Substitutions

Course:Medical Imaging and Radio Therapy-[MX5201]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Will understand and apply x-rays and its application in medical imaging.
- CO2 : Will understand and apply various Medical Imaging techniques.
- CO3 : Will understand and apply various Radio diagnostic techniques.
- CO4 : Will understand and analyze special imaging techniques used for visualizing the cross sections of the body.
- CO5 : Will understand and Enumerate Radiation therapy techniques and its safety

Course:Health Care and Hospital Equipment Management-[MX5203]

Upon completion of the course, the students will.../ will be able to...

- CO1 : Understand various health services and functions of hospitals.
- CO2 : Understand the management of hospital organization.

CO3 : Understand the various regulatory requirements and health care codes.
 CO4 : Understand the duties of trained technical personnel and functions of clinical engineer.
 CO5 : Understand the concepts of the technical work for equipment management.
 CO6 : Understand training required for equipment management and maintenance

Course:Data Acquisition and Processing Laboratory-[MX5211]

Upon completion of the course, the students will.../ will be able to...

CO1 : Apply the techniques of medical image analysis and providing security to medical data

CO2 : Analyse any physiological signal and model the physiological systems

Course:Biomedical Optics-[BM5094]

Upon completion of the course, the students will.../ will be able to...

CO1 : understand the physical properties of light

CO2 : Understand about the impact of lights in photonics, through the use and design of appropriate optical components

CO3 : Examine the practical applications of optics in surgical purpose.

CO4 : Explain the practical applications of optics in diagnostic purpose.

CO5 : Explain the application of optics in therapeutic purpose.

Course:Biomechanics-[MX5202]

Upon completion of the course, the students will.../ will be able to...

CO1 : Understand the mechanical properties of biological tissues and the properties of blood

CO2 : Gain knowledge in the mechanism of circulatory system.

CO3 : Understand the mechanical properties of bones.

CO4 : Gain knowledge in the mechanism of joints.

CO5 : Design of medical implants using software

Semester:3

Course:Quality Assurance and Safety in Hospital-[BM5074]

Upon completion of the course, the students will.../ will be able to...

CO1 : understand the concepts of healthcare quality mnabngement

CO2 : understand the need for regulatory bodies in healthcare

CO3 : understand the safety measures to be followed in hospitals

CO4 : understand the management of electrical and fire safety

CO5 : assess quality care

Course:Advanced Neural Computing-[MX5072]

Upon completion of the course, the students will.../ will be able to...

CO1 : Understand the principles of Neural Networks

CO2 : Illustrate the behaviour of neural networks

CO3 : Make use of neural network to solve real-world problems.

CO4 : Utilize the basic operators of Genetic Algorithm in Neural network

CO5 : Analyze the different neural computing techniques

Course:Human Assist Devices-[MX5301]

Upon completion of the course, the students will.../ will be able to...

CO1 : Describe the importance of Heart lung machine and artificial Heart.

CO2 : Understand the characteristics of cardiac assist devices and related issues

CO3 : Describe the principle of dialyzer

CO4 : Summarize the prosthetic and orthotic devices for rehabilitation

CO5 : Understand the function of ventilator and hearing aids

Course:Hospital / Biomedical Industry Training-[BM 5361]

Upon completion of the course, the students will.../ will be able to...

CO1 : Recall the components used internally to construct biomedical equipment's

CO2 : Develop and gain knowledge on the machines for diagnosing medical problems

CO3 : Identify and practice the steps to Install, adjust, maintain, repair, or provide technical support for biomedical equipment

CO4 : Evaluate the safety and effectiveness of biomedical equipment and other personnel on the proper use of biomedical equipment

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2020 -- 2021 ODD Semester

Course Outcomes, CO-PO and CO-PSO Mapping

Program:M.E. Applied Electronics

Semester:3

Course:Advanced Microprocessor and Microcontroller Architecture-[AP5301]
Upon completion of the course, the students will.../ will be able to... CO1 : Summarize the features and important specifications of modern microprocessors CO2 : Illustrate the salient features of CISC microprocessors. CO3 : Recall the salient features RISC processors based on ARM architecture CO4 : Describe the features and important specifications of modern microcontrollers CO5 : Explain the salient features of ARM – M3 architecture
Course:Internet of Things-[CP5292]
Upon completion of the course, the students will.../ will be able to... CO1 : To Understand the fundamentals of Internet of Things CO2 : To learn about the basics of IOT protocols CO3 : To learn about the basics of IOT protocols CO4 : To apply the concept of Internet of Things in the real world scenario.
Course:MEMS and NEMS-[VL5091]
Upon completion of the course, the students will.../ will be able to... CO1 : Develop new ideas and applications for MEMS devices. CO2 : Understand the fabrication methods used to build/construct MEMS CO3 : Discuss the design concepts of micro sensors CO4 : Explain the concepts of micro actuators. CO5 : Outline Nano systems and Quantum mechanics.