DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION

Course Objectives and Course Outcomes

Class: SE (ECT) CGPA

Course Offers

Sr. No. SEM-I	Name of Course (Theory+ Practical)
1.	Engineering Mathematic-III
2.	Electronic Devices and Circuits-I
3.	Network Theory
4.	Digital Logic Design
5.	Professional Communication
6.	Numerical Analysis and Computation
7.	Electronic Devices and Circuits-I Laboratory
8.	Numerical Analysis and Computation Laboratory
9.	Professional Communication Practice
10.	Digital Logic Design Laboratory
11.	Electronics workshop Laboratory

Sr. No. SEM-II	Name of Course (Theory+ Practical)
12.	Engineering Mathematics-IV
13.	Electronic Devices and Circuits-II
14.	Analog Communication System
15.	Signals and System
16.	Microprocessor and interfacing
17.	Object oriented Programming
18.	Electronic Devices and Circuits-II Laboratory
19.	Analog Communication System Laboratory
20.	Programming Skill Laboratory
21.	Microprocessor and interfacing Laboratory

1. Course: Engineering Mathematic-III

Course Objectives

1. To build the strong foundation in Mathematics of students needed for the field of electronics and Telecommunication Engineering
2. To provide students with mathematics fundamentals necessary to formulate, solve and analyses complex engineering problems.
3. To prepare student to apply reasoning informed by the contextual knowledge to engineering practice.
4. To prepare students to work as part of teams on multi-disciplinary projects.
5. Linear differential equations of higher order using analytical methods and numerical methods applicable to Control systems and Network analysis.
6. Vector differentiation and integration required in Electro-Magnetics and Wave theory.
7. To prepare students for basic curve tracing.

Course Outcomes (CO's)

After successful completion of the course student will be able to:

1. Students will demonstrate basic knowledge of Laplace Transform., Vector differentiation and differentiation Integration.
2. Students will demonstrate an ability to identify and Model the problems of the field of Electronics and Telecommunication and solve it.
3. Students will be able to apply the application of Mathematics in Telecommunication Engineering
4. Solve higher order linear differential equation using appropriate techniques for modeling and analyzing electrical circuits.
5. Perform vector differentiation and integration, analyze the vector fields and apply to Electro-Magnetic fields.
6. Use Vector differentiation and integration required in Electro-Magnetics and Wave theory.

7. To find symmetry, asymptote and nature of different type of curves.

2. Course: Electronic Devices and Circuits-I

Course Objectives

1. To provide a comprehensive understanding of electronic devices and circuits and.
2. To understand the working diode and transistor.
3. To study basic circuits using diodes and transistors.
4. To know the concept of feedback and design feedback amplifier.
5. To study oscillators and power amplifiers using transistor.

Course Outcomes (CO's)

After successful completion of the course student will be able to:

1. Know the characteristics of diodes and transistors
2. Design simple circuits and mini projects.
3. know the benefits of feedback in amplifier
4. Compare and classify oscillators.

3. Course: Network Theory

Course Objectives

1. To analyze the Circuits in time and frequency domain
2. To study network Topology, network Functions, two port network.
3. To synthesize passive network by various methods.

Course Outcomes (CO's)

After successful completion of the course student will be able to:

1. Apply their knowledge in analyzing Circuits by using network theorems.
2. Apply the time and frequency method of analysis.
3. Find the various parameters of two port network.
4. Apply network topology for analyzing the circuit.

5. Synthesize the network using passive elements

4. Course: Digital Logic Design

Course Objectives

1. To acquaint the students with the fundamental principles of two-valued logic and various devices used to implement logical operations on variables.
2. To lay the foundation for further studies in areas such as communication, VLSI, computer, microprocessor.

Course Outcomes (CO's)

On completion of the course, student will be able to:

1. Use the basic logic gates and various reduction techniques of digital logic circuit in detail.
2. Design combinational and sequential circuits.
3. Design and implement hardware circuit to test performance and application.
4. Understand the architecture and use of microcontrollers for the basic operations and simulate using simulation software.

5. Course: Professional Communication

Course Objectives

1. To hone Communication Skills by giving adequate exposure in reading, writing, listening and speaking
2. To help learners to acquire proficiency, both in spoken and written English.
3. To build up the learners confidence through interpersonal communication by reinforcing the basics of pronunciation
4. To help the learners to acquire behavioral skills (Time management, Stress management and Positive thinking)

Course Outcomes (CO's)

On completion of the course, student will be able to:

1. Understand and practice Oral and Writing Skills
2. Develop proficiency in English speaking and writing
3. Understand the concept of Phonetics
4. Practice behavioral skills in their professional and social life

6. Course: Numerical Analysis and Computation

Course Objectives

1. To Understand Accuracy and precision with examples.
2. To locating roots of the equations using Graphical method, Bisection method and false Position method.
3. Understand one point iterative method to find True roots.
4. To Know the Open method like Newton Rapson's Method, Multiple Roots and Secant method.
5. To find unknowns using Gauss Elimination method, Gauss Jordan method and Gauss Seidel method.
6. Understand the concept of regression method like Linear Regression, Polynomial Regression and Multiple Regression method to fit curve into straight line.
7. To find inverse matrix using LU Decomposition method.
8. To Learn Spline types like Linear, quadratic and cubical Spline.

Course Outcomes (CO's)

1. Learned the difference between Accuracy and Precision and types of errors.
2. Finding roots using Graphical method, Bisection method and False position method.
3. Solve a fixed point iteration method to obtained true roots.
4. Evaluate the True roots using Open method: Newton's Rapson method, secant method and multiple Newton Rapson method.
5. To understand the pitfalls of Gauss Elimination Method.
6. Solve a Linear System of equation using Gauss Jordan and Gauss Seidel method.
7. Solve a regression methods fit a curves using linear regression, polynomial regression and Multiple regression method.

8. To solved Linear spline, quadratic and cubical spline.

7. Course: Electronic Devices and Circuits-I Laboratory

Course Objectives

1. To identify and test various electronic components
2. To use DSO for various measurements
3. To plot the characteristics of diode and transistor
4. To design and implement feedback amplifier circuits.
5. To measure the frequency of oscillators.

Course Outcomes (CO's)

At the end of the laboratory course the students are able to:

1. Understand the diode and transistor characteristics.
2. Verify the rectifier circuits using diodes and implement them using hardware.
3. Design the biasing circuits like self biasing.
4. Design various amplifiers like CE, CC, common source amplifiers and implement them using hardware and also observe their frequency responses
5. Analyze the concepts of SCR and observe its characteristics.
6. Remember the concepts of unipolar junction transistor and observe its characteristics.
7. Understand the construction, operation and characteristics of JFET and MOSFET, which can be used in the design of amplifiers.
8. Understand the need and requirements to obtain frequency response from a transistors that Design of RF amplifiers and other high frequency amplifiers is feasible.

8. Course: Numerical Analysis and Computation Laboratory

Course Objectives

1. Perform an error analysis for various numerical methods.

2. Develop numerical methods to approximate a function using Bisection Method and False Position Method.
3. Develop numerical methods to approximate a function using one point iteration method and Secant method.
4. Develop numerical methods to approximate a function using Newton Rapson's method Multiple and Modified Newton Rapson's Method.
5. Derive appropriate numerical methods to solve a linear system of equations using Gauss Elimination method to find N unknowns.
6. Derive appropriate numerical methods to solve a linear system of equations using Gauss Jordan method to find unknowns.
7. Derive appropriate numerical methods to solve a linear system of equations Gauss Seidal method.
8. Implement linear Regression method.
9. Implement Newton's Cote Divided Difference interpolation polynomial method.
10. Code various numerical methods in a modern computer language

Course Outcomes (CO's)

Upon successful completion of this course, one should be able to:

1. Use the bisection method, false position, Newton's, Secant method to estimate the number of iterations in the algorithm to achieve desired accuracy with the given tolerance;
2. Use polynomial interpolations including the Lagrange polynomial, Newton's cotes ,cubic spline functions, for curve fitting method to evaluate the interpolations;
3. Programming Skills: write numerical programs, such as C Language programs, to solve the above problems;

9. Course: Professional Communication Practice Laboratory

Course Objectives

The language lab focuses computer-aided multi-media instructions and language acquisition to achieve the following targets:

1. To improve the students' confidence and fluency, through Situational talks, Role plays and Audio-visuals
2. To hone Group Discussions Skills, Interviews Skills and Presentation Skills
3. To improve Listening, Reading, Writing and Speaking Skills
4. To develop Pronunciation Skills

Course Outcomes (CO's)

On completion of the course, the students would be able to:

1. Improve interpersonal communication
2. Overcome stage fright and enhance confidence
3. Participate in GDs
4. Master presentation Skills and Interview Skills
5. Learn and practice Listening, Reading, Writing and Speaking Skills

10. Course: Digital Logic Design Laboratory

Course Objectives

Provide hands-on experience in digital circuits, which can be constructed by using standard integrated circuits (ICs). Investigate the operation of several digital circuits combinational and sequential.

Course Outcomes (CO's)

Upon completion of this course the students will be able to:

1. Describe and explain the operation of fundamental digital gates
2. Analyze the operation of medium complexity standard combinational circuits like the encoder, decoder, multiplexer, demultiplexer, adder .
3. Analyze the operation of a flip-flop and examine relevant timing diagrams
4. Analyze the operation of counters and shift registers
5. Design operate practical digital logic circuits

1. Course: Electronics workshop Laboratory

Course Objectives

This course gives students deep knowledge in Core Electronic components and their specifications and creates interest in Hardware Technology.

1. To focuses the fundamental concepts of software's to be used for Hardware Simulation.
2. To enhance the knowledge of component applications in Software.
3. To understand the basic concept of Layout Creation.
4. To understand Auto routing.

Course Outcomes (CO's)

Upon completion of EWS the students will be able to:

1. Able to build and Simulate Core Electronic Circuits based on syllabus.
2. Able to design and implement different Applications on Software.
3. Able to analyze the circuit and troubleshoot errors if any.
4. Build core hardware projects.

2. Course: Engineering Mathematics-IV

Course Objectives

1. To build the strong foundation in Mathematics of students needed for the field of Electronics and Telecommunication Engineering
2. To provide students with mathematics fundamentals necessary to formulate, solve and analyses complex engineering problems.
3. To prepare student to apply reasoning informed by the contextual knowledge to engineering practice.
4. To prepare students to work as part of teams on multi-disciplinary projects.
5. Complex functions, conformal mappings, contour integration applicable to Electrostatics, Digital filters, Signal and Image processing.
6. Transforms such as Z-transform and applications to Communication systems and Signal processing

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Demonstrate basic knowledge of Calculus of variation, Vector Spaces, Matrix Theory, Random Variables, Probability Distributions, Correlation and Complex Integration.
2. Demonstrate an ability to identify and Model the problems in the field of Electronics and Telecommunication and solve it.
3. Apply the application of Mathematics in Telecommunication Engineering.
4. Transforms such as Z-transform and applications to Communication systems and Signal processing.
5. Complex functions, conformal mappings, contour integration applicable to Electrostatics, Digital filters, Signal and Image processing.

13. Course: Electronic Devices and Circuits-II

Course Objectives

1. To understand the working of transistor at high frequency
2. To know the working of transistorized and IC based multivibrator circuits
3. To study op. amp. working and its analysis
4. To design simple linear and nonlinear circuits using op. amp.
5. To design fixed and variable voltage, voltage regulators

Course Outcomes (CO's)

On completion of the course, student will be able to:

1. Design and analyze the basic operations of MOSFET.
2. Know about the multistage amplifier using BJT and FET in various configuration to determine frequency response and concept of voltage gain.
3. Know about different power amplifier circuits, their design and use in electronics and communication circuits.
4. Know the concept of feedback amplifier and their characteristics.

5. Design the different oscillator circuits for various frequencies
6. Know the transistor high frequency working and its frequency response
7. Design simple circuits using voltage regulators and IC 555
8. Compare ideal op. amp and practical op. amp.
9. Distinguish between JFET and BJT.

14. Course: Analog Communication System

Course Objectives

The students are expected to demonstrate the ability to:

1. Describe and analyze the mathematical techniques of generation, transmission and reception of amplitude modulation (AM), frequency modulation (FM) and phase modulation (PM) signals.
2. Evaluate the performance levels (Signal-to-Noise Ratio) of AM, FM and PM systems in the presence of additive white noise.
3. Convert analog signals to digital format and describe Pulse and digital Modulation techniques.

Course Outcomes (CO's)

After the successful completion of the course student should be able to:

1. Understand and identify the fundamental concepts and various components of analog communication systems.
2. Explain signal to noise ratio, noise figure and noise temperature for single and cascaded stages in a communication system.
3. Describe analog pulse modulation techniques and digital modulation technique.
4. Develop the ability to compare and contrast the strengths and weaknesses of various communication systems.

15. Course: Signals and System

Course Objectives

1. To introduce students the concept and theory of signals and systems needed in electronics and telecommunication engineering fields.
2. To introduce students to the basic idea of signal and system analysis and its characterization in time and frequency domain.
3. To understand the mathematical description of continuous and discrete time signals and systems
4. To classify signals into different categories.
5. To Analyze Linear Time Invariant (LTI) systems in time transform domains.
6. To build basics for understanding of courses such as signal processing, control system and communication.

Course Outcomes (CO's)

After successful completion of the course student will be able to:

1. Understand about various types of signals and systems, classify them, analyze them, and perform various operations on them,
2. Understand use of transforms in analysis of signals and system in continuous and discrete time domain.
3. Observe the effect of various properties and operations of signals and systems.
4. Evaluate the time and frequency response of Continuous and Discrete time systems which are useful to understand the behavior of electronic circuits and communication systems.
5. Develop input output relationship for linear shift invariant system and understand the convolution operator for continuous and discrete time system.
6. Understand and resolve the signals in frequency domain using Fourier series , Fourier transforms and Laplace transform.

16. Course: Microprocessor and interfacing

Course Objectives

1. To understand the applications of Microprocessors.
2. To understand need of Microprocessors in computer system.
3. To understand architecture and features of typical Microprocessors.
4. To learn interfacing of real world input and output devices.
5. To study various hardware & software tools for developing applications.

Course Outcomes (CO's)

Upon completion of this course, the students shall be able to:

1. Learn importance of Microprocessors in designing real time applications
2. Describe the 8085,8086 & 80386 Microprocessors architectures and its feature.
3. Develop interfacing to real world devices.
4. Learn use of hardware & software tools.

17. Course: Object oriented Programming

Course Objectives

1. Make the students familiar with basic concepts and techniques of object oriented programming in C++.
2. Develop an ability to write programs in C++ for problem solving.
3. Develop types of inheritance like single, multiple, multilevel hierarchical and hybrid inheritance.
4. Develop operator overloading with unary and binary operator overloading.
5. Develop program to use of constructor and destructor with its types.

Course Outcomes (CO's)

After Completing the course students will be able to:

1. Describe the principles of object oriented programming.
2. Apply the concepts of data encapsulation, inheritance in C++.
3. Understand basic program constructs in C++.

4. Apply the concepts of classes, methods and inheritance to write C++ programs.
5. Use arrays, vectors and strings concepts and interfaces to write C++ programs.
6. Describe and use the concepts in OOPs to develop user friendly program.

18. Course: Electronic Devices and Circuits-II Laboratory

Course Objectives

1. To understand the importance of op-amp in various applications like Precision Rectifiers, Filters, and DAC.
2. To design the non-linear application of op-amp such as Schmitt circuit.
3. To study and design the application of 555 timer like mono-stable Multivibrator.
4. Familiarize the conversion of data from Analog to Digital and Digital to Analog.
5. Design and construct waveform generation circuits using op-amp.

Course Outcomes (CO's)

Upon completion of this course, the students shall be able to:

1. Understand the various applications of linear IC's like 741 and 555 timer.
2. Define significance of Op Amps and their importance.
3. Build circuits using Analog IC's.
4. In-depth knowledge of applying the concepts in real time applications.
5. Ability to use OP Amp as Summation, Subtractor.
6. Able to use OP Amp to generate sine, square and triangular wave forms.
7. Able to use OP Amp as analog to digital and digital to analog converter.

19. Course: Analog Communication System Laboratory

Course Objectives

The course consist analog communications lab in practice, time domain and the frequency domain. We will cover the basic types of analog modulation (AM, FM, and phase modulation…) from both Simulink and equipment based.

Course Outcomes (CO's)

On completion of this lab course the student will be able to:

1. Able to identify and describe different analog modulation techniques.
2. Able to analyze AM radio receiver.
3. Able to use the any AM techniques in MATLAB simulink.

20. Course: Programming Skill Laboratory

Course Objectives

1. To familiarize students with object-oriented concepts and their implementation in C++.
2. To facilitate students with the skills required to solve problems using object oriented concepts

Course Outcomes (CO's)

Upon successful completion of the course, students will be able to:

1. Understand the process of writing, compiling and executing programs in C++ using appropriate predefined functions in C++.
2. Implement the object oriented concepts in developing application using C++.
3. Developing applications in C++ using the understanding of Inheritance and polymorphism.
4. Understand and use exception handling while developing a C++ application.
5. Understand stream I/O, Files and usage of the available classes to handle stream objects in C++ language.
6. Develop complex applications by identifying the appropriate features of object oriented programming to solve real world problems using C++.
7. Student will understand procedure-oriented and object oriented programming concepts. He/she will be capable of writing C and C++ programs efficiently.

21. Course: Microprocessor and interfacing Laboratory

Course Objectives

On completion of this course, the students shall be able to:

1. To provide practical exposure to the students on microprocessors, design and coding knowledge on 80x86 family.
2. To give the knowledge and practical exposure on connectivity and execute of interfacing devices with 8086 kit like LED displays, Keyboards, DAC/ADC, and various other devices.

Course Outcomes (CO's)

The expected outcomes of the course:

1. Learn importance of Microprocessors 8086 in designing real time applications
2. Develop interfacing to real world devices like LED displays, Keyboards, DAC/ADC, and various other devices.
3. Learn use of hardware & software tools

Class: TE (ECT) CGPA

Course Offers

Sr. No. SEM-I	Name of Course (Theory+ Practical)
1.	**Data Structures and Computer algorithms**
2.	**Digital Signal Processing**
3.	**Control Systems**
4.	**Stochastic Processes**
5.	**Embedded System Design**

6.	**Professional Ethics**
7.	**Embedded System Design Lab**
8.	**Data Structure and Computer Algorithm Lab**
9.	**Digital Signal Processing Lab**
10.	**Control System Lab**
11.	**Mini Project-I**
Sr. No. SEM-II	**Name of Course (Theory+ Practical)**
12.	**Digital Communication Systems**
13.	**Digital System Design using HDL**
14.	**Electromagnetic Engineering**
15.	**Power Electronics**
16.	**Electronic Instruments & Measurements**
17.	**Professional Aptitude & Logical Reasoning**
18.	**Power Electronics Lab**
19.	**Digital Communication System Lab**
20.	**Digital System Design using HDL**

21.	**Electronic Instruments & Measurements Lab**
22.	**Mini- Project-II**

1. Course: Data Structure and Computer Algorithms

Course Objectives

Students who complete this course will be able to:

1. Write programs that use data structures such as: arrays, linked lists, stacks, queues, trees, hash tables, and graphs.
2. Compare and contrast the cost and benefits of dynamic and static structure implementations.
3. Choose the appropriate data structure for modeling a given problem.
4. Describe the concept of recursion and give examples of its use, identifying the base case and the general case of a recursively defined problem.
5. Compare iterative and recursive solutions for elementary problems.
6. Determine when a recursive solution is appropriate for a problem.
7. Determine the time and space complexity of simple algorithms and recursively defined algorithms.
8. Implement both a greedy and a divide-and-conquer algorithm to solve problems.
9. Implement the most common sorting algorithms.
10. Solve problems using the fundamental graph algorithms, including depth-first and breadth first search, topological sort, minimum spanning tree algorithm, and single-source shortest path.

Course Outcomes (CO's)

1. Understand the concepts of data structure, data type and array data structure.
2. Analyze algorithms and determine their time complexity.
3. Implement linked list data structure to solve various problems.
4. Understand and apply various data structure such as stacks, queues, trees and graphs to solve various computing problems using C-programming language.
5. Implement and know when to apply standard algorithms for searching and sorting.
6. Effectively choose the data structure that efficiently model the information in a problem

1. Course: Digital Signal Processing

Course Objectives

1. Understand fundamentals of Digital Signal Processing.
2. Analyze & compare different signal processing strategies.
3. Become aware of some applications of DSP.

Course Outcomes (CO's)

1. Understand the Discrete Time Signals analytically & Visualize them in the time and frequency domain.
2. Able to Understand the Transform domain & its significance & problems related to computational complexity.
3. Be able to specify & design any digital filters.

3. Course: Control Systems

Course Objectives

1. To teach the fundamental concepts of Control systems and mathematical modeling of the system

2. To study the concept of time response and frequency response of the system
3. To teach the basics of stability analysis of the system

Course Outcomes (CO's)

1. Represent the mathematical model of a system
2. Determine the response of different order systems for various step inputs
3. Analyze the stability of the system

4. Course: Stochastic Processes

Course Objectives

1. To provide necessary basic concepts in statistical signal analysis.
2. To study about random processes and its properties
3. Apply the basic concepts to various elementary applications.

Course Outcomes (CO's)

1. Have a fundamental knowledge of the basic probability concepts
2. Have a good knowledge of standard distributions and density function which can describe real life phenomena.
3. Acquire skills in handling situations involving several random variable and functions of random variables.
4. Understand and characterize phenomena which evolve with respect to time in probabilistic manner.

5. Course: Embedded System Design

Course Objectives

1. To understand the need and applications of Microcontrollers and ARM Processors in embedded system.
2. To understand architecture and features of typical Microcontroller.
3. To understand architecture and features of ARM7 Processor.
4. To learn interfacing of real world input and output devices

5. To study various hardware and software tools for developing applications

Course Outcomes (CO's)

1. After successfully completing the course students will be able to describe the microcontroller and ARM Processor Architecture and its Features.
2. Learn importance of microcontroller and ARM Processor in designing embedded applications.
3. Learn use of hardware and software tools.
4. Develop interfacing to real world devices.

6. Course: Professional Ethics

Course Objectives

1. To create awareness on Engineering Ethics and Human Values.
2. To understand social responsibility of an engineer.
3. To appreciate ethical dilemma while discharging duties in professional life.

Course Outcomes (CO's)

At the end of the course, students should:

1. Be able to distinguish among morals, values, ethics, and the law and to explore how they impact professional practice;
2. Have an increased personal understanding of issues related to ethics and the law;
3. Have examined one's own ethical decision-making processes and develop guidelines for enhancing one's ability to generate ethical behavior and solutions to conflicts arising in the practice.

7. Course: Embedded Systems Design Lab

Course Objectives

1. Demonstrate the sensing of different physical parameters.
2. Explain the calibration of parameters measured and displayed.
3. Demonstrate PLC based control on simulation module.

4. Evaluate the data transfer.

Course Outcomes (CO's)

1. Define the arithmetical and logical assembly language for microcontroller AT89C51.
2. Know the downloading procedure on hardware into flash ROM of AT89C51 and show the testing data on defined port wish board.
3. Competent to evaluate the data transfer response ofXC9572CPL and Spartan3 .

8. Course: Data Structures and Computer Algorithms Lab

Course Objectives

1. Familiarized Students with good programming Design methods, particularly TopDown Design and Bottomup Design.
2. Develop algorithms for manipulating stacks, queues, linked lists, trees, and graphs.
3. Develop the data structures for implementing the above algorithms.
4. Develop recursive algorithms as they apply to trees and graphs.
5. Demonstrate understanding of various sorting algorithms, including bubble sort, selection sort, quick sort, merge sort, heap sort, and distribution sort.
6. Familiarize the student with the issues of Time complexity and examine various algorithms from this perspective.

Course Outcomes (CO's)

Students who complete this course will be able to:

1. Understand the structure and abstract data types, and their basic usability in different application through different programming language.
2. Analyze and differentiate different algorithms based on their time complexity.
3. Understand the linked implementation, and its uses both in linear and non-linear Data structure.

4. Understand various data structure such as stacks, queues, trees, graphs, etc. to solve various computing problems.
5. Implement various kinds of searching and sorting techniques, and know when to choose which technique.
6. Decide a suitable data structure and algorithm to solve a real world problem.

9. Course: Digital Signal Processing Lab

Course Objectives

1. To generate the elementary signals/ waveforms.
2. To Calculate and Plot DFT / IDFT of given DT signal and prove it theoretical.
3. To plot frequency response of a given LTI system.
4. To Implement FFT of a given sequence.
5. To determine and plot the Power Spectrum of a given signal(s).
6. To Plot Magnitude and Phase of LP FIR filter for any given sequence.
7. To Plot Magnitude and Phase of HP FIR filter for a given sequence.
8. Plot Magnitude and Phase of LP IIR filter for a given sequence.
9. To Plot Magnitude and Phase of HP IIR filter for a given sequence.
10. To generate Sinusoidal signal through filtering.
11. To generate DTMF signals.

Course Outcomes (CO's)

1. Able to generate elementary signals/ waveforms and perform arithmetic operations on signals.
2. Able to Calculate and Plot DFT / IDFT of given DT signal.
3. Able to plot frequency response of a given system and verify the properties of LTI system.
4. Able to Implement FFT of given sequence and identify the reduction of computations using FFT.
5. Able to Implement LP FIR filter for a given sequence and calculate the filter coefficients.
6. Able to Implement HP FIR filter for a given sequence and plot the response of the same.
7. Able to Implement and design LP IIR filter for a given sequence.
8. Able to Implement HP IIR filter for a given sequence.

9. Able to Implement Decimation Process and vary (decrease) the sampling rate.
10. Able to Implement Interpolation Process and vary (increase) the sampling rate.

10. Course: Control System Lab

Course Objectives

After Completing the course students will be able to:

1. Will have a strong knowledge on MATLAB software.
2. They get the Basic knowledge on practical control system and PLC application.
3. They get the knowledge on application of machines and electronics devices with control system.

Course Outcomes (CO's)

Upon completion of this course the students will be able to:

1. Will have a strong knowledge of MATALB software.
2. Will be able to various engineering projects.
3. Ability to formulate transfer function for the given control system problem.
4. Ability to find time response of the given control system model.
5. Plot Root Locus and Bode plots for the given control system model.
6. Ability to design Lead, Lag, Lead-Lag system in control system.
7. Ability to design PID controllers for the given control system model.

11. Course: Mini- Project-I Lab

Course Objectives

1. To be able to apply some of the techniques/principles you have been taught
2. To carry out budget and time planning for the project.
3. To inculcate electronic hardware implementation skills by learning PCB artwork design using an appropriate EDA tool.
4. To follow correct grounding and shielding practices
5. To do effective trouble-shooting of the mini project.

6. To develop effective communication skill by delivering a seminar based on mini project

Course Outcomes (CO's)

Upon completion of mini project the students will be able to:

1. Demonstrate a through and systematic understanding of project contents.
2. Understand methodologies and professional way of documentation and communication.
3. Know the key stages in development of the project.
4. Extend or use the idea in mini project for major project.

12. Course: Digital Communication Systems

Course Objectives

1. To understand the building blocks of digital commutation system.
2. To analyze error performance of a digital communication system in presence of noise and other interferences.
3. To understand information theoretic behavior of a communication system.
4. To understand various source coding and channel coding techniques.
5. To understand Multiple Access and Spread Spectrum Techniques.

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Perform the time and frequency domain analysis of the signals in digital communication systems.
2. Design a suitable source and channel coding scheme for a communication system.
3. Analyze Performance of Multiple Access and Spread Spectrum Techniques

13. Course: Digital System Design using HDL

Course Objectives

1. Learn the IEEE Standard 1076 Hardware Description Language (VHDL)

2. Be able to model complex digital systems at several level of abstractions; behavioral and structural, synthesis and rapid system prototyping.
3. Be able to develop and simulate register-level models of hierarchical digital systems
4. Develop a formal test bench from informal system requirements
5. Be able to design and model complex digital system independently or in a team

Course Outcomes (CO's)

After the successful completion of the course student should be able to:

1. Students learn modeling using the IEEE Standard 1076 VHDL
2. Students are exposed to the industrial standards of modeling complex digital systems.
3. The course uses state-of-the-art industrial strength CAD tools and is strongly influenced by industry practice.

14. Course: Electromagnetic Engineering

Course Objectives

1. To provide the basics skills required to understand develop, design, various engineering applications involving electrostatic and electromagnetic fields.
2. To lay the foundations of electromagnetism & its practice in modern communications such as wireless, guided wave principles such as fiber optics & electromagnetic structures.

Course Outcomes (CO's)

After the successful completion of the course student should be able to:

1. Apply vector calculus to static electric-magnetic fields in different engineering situations.
2. Analyze Maxwell's equations in different forms (differential & integral) & apply them to engineering problems.
3. Examine the phenomena of wave propagation in different media & its interfaces & in applications of microwave engineering.

4. Analyze the nature of electromagnetic wave propagation in guided medium which are used in microwave applications.

15. Course: Power Electronics

Course Objectives

1. To teach fundamental principles of thyristor family.
2. To develop an overall approach for students from construction of control rectifier , inverter, choppers, study its specification, the functionality, design and practical applications
3. To become familiar with power devices and their application in various fields
4. Learners are expected to understand various controllers , converters , inverters and choppers

Course Outcomes (CO's)

After successful completion of the course student will be able to:

1. Demonstrate an understanding of fundamentals of thyristor family.
2. Analyze the various applications and circuits based on thyristor .
3. Build and test circuits using power devices such as SCR, IGBT and MOSFET.
4. Analyze and design controlled rectifier, DC to DC converters, DC to AC inverters, how to analyze these inverters and some basic application examples.

16. Course: Electronic Instruments & Measurements

Course Objectives

1. To understand scientific measurement principles and concepts behind modern electronic instrumentation
2. To understand the principle of various types of transducers
3. To know the construction and working of frequently used equipment's like CRO, Signal generator, spectrum analyzer etc.

Course Outcomes (CO's)

Upon completion of this course, the students shall be able to:

1. To identify various errors in measurement system and correct them.
2. To know the fundamentals of measuring systems including the particular limitations and capabilities Of a number of measuring devices (pressure transducers, strain gages, thermocouples, etc.) and Equipment's (oscilloscope, spectrum analyzer, etc.).
3. To be familiar with various computer controlled test systems

17. Course: Professional Aptitude and Logical Reasoning

Course Objectives

1. Study team management training from mind tools
2. Study General vocational aptitude
3. Study Professional Aptitude, role attitude and aptitude in success
4. Aptitude based career planning
5. To develop right skills for a position , scientific about evaluating people
6. Encourage individual, increase students confidence in their career practice and their confidence to take risk..

Course Outcomes (CO's)

After Completing the course students will be able to:

1. Knowledge of the wider sector, governmental and legislative contexts and impact of these on your professional practices.

2. Knowledge of ways of thinking and practicing that are specific to the discipline.

3. Strong foundation in aptitude basics.

18. Course: Power Electronics Lab

Course Objectives

1. To provide the students a deep insight in to the working of different switching devices with respect to their characteristics
2. To analyze different converters and control with their applications.
3. To study advanced converters and switching techniques implemented in recent technology

Course Outcomes (CO's)

Upon completion of this course, the students shall be able to:

1. Articulate the basics of power electronic devices.
2. Express the design and control of rectifiers, inverters.
3. Design of power electronic converters in power control applications.
4. Ability to express characteristics of SCR, BJT, MOSFET and IGBT.
5. Ability to express communication methods.
6. Ability design AC voltage controller and Cyclo Converter.
7. Ability to design Chopper circuits.

19. Course: Digital Communication System Lab

Course Objectives

This course gives students deep knowledge in digital communication systems at the practical level.

1. To focuses the fundamental concepts on TDM, Pulse modulations, digital modulation techniques.
2. To enhance the knowledge of source coding techniquesand Error-control coding techniques.
3. To understand the basic concept of digital commutation system.
4. To understand Multiple Access and Spread Spectrum Techniques for mobile and cellular communication system.

Course Outcomes (CO's)

On completion of this lab course the students will be able to:

1. Able to understand basic theories of Digital communication system in practical.
2. Able to design and implement different modulation and demodulation techniques.
3. Able to analyze digital modulation techniques by using MATLAB tools.
4. Able to identify and describe different techniques in modern digital communications, in particular in source coding using MAT Lab tools.
5. Able to perform channel coding.

20. Course: Digital System Design using HDL Lab

Course Objectives

1. Learn the IEEE Standard 1076 Hardware Description Language (VHDL)
2. Be able to model complex digital systems at several level of abstractions; behavioral and structural, synthesis and rapid system prototyping.
3. Be able to develop and simulate register-level models of hierarchical digital systems
4. Develop a formal test bench from informal system requirements
5. Be able to design and model complex digital system independently or in a team

Course Outcomes (CO's)

1. Students learn modeling using the IEEE Standard 1076 VHDL
2. Students are exposed to the industrial standards of modeling complex digital systems.
3. The course uses state-of-the-art industrial strength CAD tools and is strongly influenced by industry practice.

21. Course: Electronics Instruments & Measurements Lab

Course Objectives

On completion of this course, the students shall be able to:

1. To introduce students to monitor, analyze and control any physical system
2. To understand students how different type of meters work and their construction

3. To provide a student a knowledge to design and create novel products and solutions for real life problems.
4. To introduce students a knowledge to use modern tools necessary for electrical projects.

Course Outcomes (CO's)

The expected outcomes of the course:

1. To use the techniques and skills for electrical projects.
2. Design a system, component or process to meet desired needs in electrical engineering.
3. Measurement of R,L,C, Voltage, Current, Power Factor, Power, Energy
4. Ability to measure frequency, phase with Oscilloscope
5. Ability to use Digital voltmeters
6. Ability to use Digital Multimeter and different types of transducer .

22. Course: Mini- Project-II Lab

Course Objectives

1. To be able to apply some of the techniques/principles you have been taught
2. To carry out budget and time planning for the project.
3. To inculcate electronic hardware implementation skills by learning PCB artwork design using an appropriate EDA tool.
4. To follow correct grounding and shielding practices
5. To do effective trouble-shooting of the mini project.
6. To develop effective communication skill by delivering a seminar based on mini project.

Course Outcomes (CO's)

Upon Completion of mini project the students will be able to:

1. Demonstrate a through and systematic understanding of project contents.
2. Understand methodologies and professional way of documentation and communication.
3. Know the key stages in development of the project.
4. Extend or use the idea in mini project for major project.

Class: BE (ECT) CGPA

Course Offers

Sr. No. SEM-I & II	Name of Course(Theory + Practical)
1.	Digital VLSI Design
2.	RF antenna & Microwave Engineering
3.	Elective-I a) Satellite Communication & Radar Engineering
	Elective-I b) Micro Electronics
	Elective-I c) Real Time Operating System
	Elective-I d) System Software & Operating System
4.	Elective-II a) Wireless & Mobile Communication
	Elective-II b) Artificial Neural Network
	Elective-II c) Mechatronics
	Elective-II d) Digital Images Processing
5.	DVLSI Laboratory
6.	RAFM Laboratory
7.	Project Laboratory-I

08.	**Computer Network**
09.	**Optical Fiber Communication**
10.	**Elective-III a) Audio Video Engineering**
	Elective-III b) Electronics Product Design
	Elective-III c) IOT & Sensor Network
	Elective-III d) Cloud Computing
11.	**Elective-IV a) Multi Carrier Communication**
	Elective-IV b) Analog & Mixed Signal VLSI Design
	Elective-IV c) Biomedical Engineering
	Elective-IV d) Industrial Organization & Project Management
12.	**Computer Network Laboratory**
13.	**Optical Fiber Communication Laboratory**
14.	**Project-II Laboratory**

1. Course: Digital VLSI Design

Course Objectives

1. To understand fundamental steps in digital VLSI design.
2. To learn various techniques of CMOS design.
3. To study the data path design.

Course Outcomes (CO's)

1. Model digital circuit with, simulate, synthesis in Micro wind.
2. Understand chip level issues and need of testability.
3. Design digital CMOS circuits for specified applications.

2. Course: RF Antenna & Microwave Engineering

Course Objectives

Study the operation of Microwave semiconductor devices:

1. Study Microwave Communication System
2. Understand the basic concept of RF antenna and its application

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Ability to understand the basic operation and working of Microwave Tubes
2. Identify the state of art microwave tubes and semiconductors and their real use in real life
3. Application of microwave and RF antenna for industrial and scientific purpose

3 a) Course: Elective-I: Satellite Communication & Radar Engineering

Course Objectives

1. To provide an in-depth understanding of different concepts used in a satellite communication system.
2. To explain the tools necessary for the calculation of basic parameters in a satellite communication system.
3. To get knowledge of every aspects of satellite communication like orbital mechanics, launching techniques, satellite link design, earth station technology and different access system towards a satellite.
4. To get a complete knowledge about the earth and space subsystems
5. To gain knowledge about the Satellite Access schemes
6. To gain knowledge about the Satellite system and mobile services provided
7. To get the basic concepts, operation, and applications of modern radar systems.

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Understand fundamental underlying principles of satellite communication
2. Describe complete knowledge about the earth and space subsystems
3. Have a basic knowledge of the use of Satellite system and mobile services provided.
4. Explain the basics of satellite communication
5. Explain and analyzes link budget of satellite signal for proper communication
6. Use the different application of satellite communication.

3 b) Course: Elective-I: Microelectronics

Course Objectives

As part of this course, students:

1. Will understand the physical, electrical, and optical properties of semiconductor materials and their use in microelectronic.

2. Relate the atomic and physical properties of semiconductor materials to device and circuit performance issues.

3. Develop an understanding of the connection between device-level and circuit-level performance of microelectronic systems.

Course Outcomes (CO's)

After successfully completing the course students will be able to upon successful completion of this course, students should be able to:

1. Compute carrier concentrations for semiconductor materials under a variety of doping conditions.
2. Compute conductivity and resistivity of semiconductor materials under a variety of condition.
3. Silicon wafer processing and formation of P N junction using diffusion and Ion Implantation technique
4. Wet and Dry oxidation process required for photolithography process.
5. Manufacturing process for P N junction, BJT, MOS, and IC fabrication.

3 c) Course: Elective-I: Real Time Operating System

Course Objectives

1. To introduce students to the fundamental problems, concepts, and approaches in the design and analysis of real-time systems.
2. To study issues related to the design and analysis of systems with real-time constraints.
3. To understand Different types of operating systems.
4. To understand different real time case studies.

Course Outcomes (CO's)

1. An ability to analyze, design and implement a real-time system.
2. Characterize and debug a real-time system.
3. Apply formal methods for scheduling real-time systems.

3 d) Course: Elective-I: System Software & Operating System

Course Objectives

1. To familiarize the students with:
2. The introduction to software systems with an emphasis on operating system design and implementation.
3. Key aspect of computer architecture and system software interaction with process management, threading, synchronization, deadlock, scheduling, security and distributed systems.

Course Outcomes (CO's)

By the end of the course student will be able to:

1. Understand Operating System Structure, Operations and Services, Process Concept, thread , deadlock, Process Scheduling and Synchronization.
2. Understand concepts of Memory Management with memory allocation and File Systems with security.

4 a) Course: Elective-II: Wireless & Mobile Communication

Course Objectives

1. The objective of the course is to introduce the Concepts of basic wireless and mobile communication systems.

2. To learn and understand the basic principles of Telecommunication switching, traffic and networks.
3. To learn and understand basic concepts of cellular system, wireless propagation and the techniques used to maximize the capacity of cellular network.
4. To learn and understand architecture of GSM and CDMA system.
5. To understand mobile management, voice signal processing and coding in GSM and CDMA system

Course Outcomes (CO's)

1. Explain and apply the concepts of telecommunication switching, traffic and networks.
2. Analyze the telecommunication traffic.
3. Analyze radio channel and cellular capacity

4 b) Course: Elective-II: Artificial Neural Network

Course Objectives

1. To learn basic learning rules
2. To learn different classifiers
3. To understand multilayer feed forward networks
4. To understand single-layer feedback networks and associative memories
5. To give introduction to fuzzy logic

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Use neural networks for practical applications such as character recognition and control systems
2. Apply Fuzzy logic for practical application.

4 c) Course: Elective-II: Mechatronics

Course Objectives

1. To understand the different sensors and measuring instruments..
2. To learn the different considerations of mechanical and electronic designs.
3. To understand different control systems and their designs.

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Understand various stages of electronics, mechanical control and design
2. Special design considerations and importance of different controller modes and discrete

4 d) Course: Elective-II: Digital Image Processing

Course Objectives

1. To understand fundamental steps in digital image processing.
2. To learn various techniques of image enhancement.
3. To study the techniques of image compression.

Course Outcomes (CO's)

At the end of the course, the students will be able to:

1. Enhance a poor quality image.
2. Develop and implement algorithms for digital image processing.
3. Explore the novel application of image processing.

5. Course: DVLSI Laboratory

Course Objectives

1. To Teach fundaments of circuit design and implantation using circuit simulators.
2. To highlight the circuit design issues in the context of VLSI technology.
3. To Teach fundaments of circuit design and implantation using layout editors (Microwind).
4. To teach the complexity in wiring issues in design.

Course Outcomes (CO's)

At the end of the course, the students will be able to:

1. Demonstrate a clear understanding of CMOS fabrication flow and technology scaling.
2. Design MOSFET based logical circuit.
3. Draw layout of a given logical circuit.
4. Realize logic circuit with different design style.
5. Demonstrate an understanding of working principal of operation of different types of memories.
6. Demonstrate an understanding of working principles of clocking, power reduction and distribution.

6. Course: RF Antenna & Microwave Engineering Laboratory

Course Objectives

The objective of this course is to introduce the theory and concept of radio frequency integrated system

1. Practical Radio Frequency Test and Measurement
2. How to generate a radio wave.
3. How do a RF transmitter and receiver work?

Course Outcomes (CO's)

After completing the course students will be able to:

1. Understand radio-frequency systems and their applications
2. Analyze the performance parameters of radio frequency circuits
3. Analyze the performance parameters of radio frequency circuits and identify design trade-off of radio frequency communication systems.

8. Course: Computer Network

Course Objectives

The student should be made to:

1. Understand the division of network functionalities into layers.
2. Be familiar with the components required to build different of network
3. Be exposed to the required function at each layer
4. Learn the flow control and congestion control algorithms

Course Outcomes (CO's)

At the end of the course, the students should be able to:

1. Identify the components required to build different types of network
2. Choose the required functionality at each layer for given application identify solution for each function at each layer
3. Trace the flow of information from one to another node in the network

9. Course: Optical Fiber Communication

Course Objectives

1. To understand basic elements of optical fiber communication link.
2. To know different kind of losses in optical fiber.
3. To design a fiber optic communication link and carry out power budget analysis.

Course Outcomes (CO's)

At the end of the course, the students will be able to:

1. Estimate various losses in optical fiber.
2. Design fiber optic communication link.
3. Find out the necessity of optical amplifier.

10 a) Course: Elective-III: Audio Video Engineering

Course Objectives

1. It is to provide students with a strong understanding of the fundamental principle and practical application of audio and video with latest updates.

Course Outcomes (CO's)

1. Understand the concept of basic television signal processing.
2. Identify globally accepted color TV standards.
3. Demonstrate the need of audio and video compression techniques in real life.
4. Acquire knowledge of latest digital TV systems and applications.
5. Describe the attributes of acoustics, sound engineering and storage media.

10 b) Course: Elective-III: Electronic Product Design

Course Objectives

1. To understand the stages of product (hardware/ software) design and development.
2. To learn the different considerations of analog, digital and mixed circuit design.
3. To be acquainted with methods of PCB design & different tools used for PCB design.
4. To understand the importance of testing in product design cycle.
5. To understand the processes and importance of documentation.

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Understand various stages of hardware, software and PCB design.
2. Importance of product test & test specifications.
3. Special design consideration and importance of documentation.

10 c) Course: Elective-III: Internet of Things & Sensor

Course Objectives

1. Vision and Introduction to IoT.
2. Understand IoT Market perspective.
3. Data and Knowledge Management and use of Devices in IoT Technology.
4. Understand State of the Art – IoT Architecture.
5. Real World IoT Design Constraints, Industrial Automation and Commercial Building
6. Automation in IoT.

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Explain in a concise manner how the general Internet as well as Internet of Things work.
2. Analyze trade-offs in interconnected wireless embedded sensor networks.
3. Understand the vision of IoT from a global context.
4. Determine the Market perspective of IoT.
5. Building state of the art architecture in IoT.
6. Application of IoT in Industrial and Commercial Building Automation and Real World Design Constraints.

10 d) Course: Elective-III: Cloud Computing

Course Objectives

1. Discuss, with confidence, what is cloud computing and what are key security and control considerations within cloud computing environments.
2. Identify various cloud services.
3. Assess cloud characteristics and service attributes, for compliance with enterprise objectives.

4. Explain the four primary cloud category types.
5. Evaluate various cloud delivery models.
6. Contrast the risks and benefits of implementing cloud computing.
7. Specify security threat exposure within a cloud computing infrastructure.
8. Recognize steps and processes used to perform an audit assessment of a cloud computing environment.
9. Summarize specific environments that would benefit from implementing cloud computing, Contrasted against those environments that might not benefit.
10. Weight the impact of improperly controlled cloud computing environments on organizational sustainability.

Course Outcomes (CO's)

1. To impart fundamental concepts in the area of cloud computing.
2. To impart knowledge in applications of cloud computing.
3. Understanding the systems, protocols and mechanisms to support cloud computing.
4. Develop applications for cloud computing.
5. Understanding the hardware necessary for cloud computing.
6. Design and implement a novel cloud computing application.

11 a) Course: Elective-IV: Multi Carrier Communication

Course Objectives

1. Understand the basic concept of OFDM system with its advantages, disadvantages and limitations.
2. Understand the limits on CDMA & OFDM systems
3. Understand basic principles of OFDM systems
4. Perform analysis of OFDM systems
5. Be familiar with other modern communication systems.

Course Outcomes (CO's)

1. Able to distinguish between different modern communications systems.
2. Able to overcome the limitations of different multicarrier system.
3. Knows the importance of channel estimation.
4. Be able to design OFDM system.

11 b) Course: Elective-IV: Analog and Mixed Signal VLSI

Course Objectives

1. To understand fundamental steps in analog VLSI design.
2. To learn various techniques ADC and DAC design.
3. To study the OP-AMP design.

Course Outcomes (CO's)

1. Model analog circuit with, simulate, synthesis in Micro wind.
2. Understand chip level issues and need of testability.
3. Design OP-AMP circuits for specified applications.

11 c) Course: Elective-IV: Biomedical Electronics

Course Objectives

1. To develop skills enabling Biomedical Engineers to serve Hospitals, National and International Industries and Government Agencies
2. To understand the basic principle, working and design of various automated diagnostic equipment's.
3. To develop core competency in the field of Biomedical Engineering to gain technical expertise in biology and medicine for effective contribution in the development and improvement of health care solutions.

Course Outcomes (CO's)

1. Demonstrate the principles of electronics used in designing various diagnostic equipment and provide a better technical support with exposure to the hospitals.
2. Exhibit competency in suggesting, designing and offering the reliable and optimum solution after understanding customer's requirement completely.
3. Demonstrate ability of correlating theoretical concepts with their practical implementation while performing laboratory exercises and project work.
4. Use modern methodologies, multidisciplinary skill set and knowledge while working on real time projects that demand convergence of engineering, science and technology.

11 d) Course: Elective-IV: Industrial Organization & Project Management

Course Objectives

1. To understand Organizational Structure.
2. To understand the role of private sector in industry growth.
3. To handle complex task of time estimation & project scheduling including PERT & CPM.
4. To understand behavior & psychology of the industry.
5. To appreciate & understand the use of computers in project management.

Course Outcomes (CO's)

1. Students will able to follow types of industries.
2. Students can evaluate time estimation of the project used in industry.
3. Students will able to understand software evaluation used with industry.

12. Course: Computer Network Laboratory

Course Objectives

1. Analyze the different layers in networks.
2. Define, use, and differentiate such concepts as OSI-ISO,TCP/IP.
3. How to send bits from physical layer to data link layer
4. Sending frames from data link layer to Network layer
5. Different algorithms in Network layer
6. Analyze the presentation layer, application layer
7. They can understand how the data transferred from source to destination
8. They can come to know that how the routing algorithms worked out in network layer

Course Outcomes (CO's)

After successfully completing the course students will be able to:

1. Understand fundaments underlying principles of computer networking.
2. Understanding details and functionality of layered network architecture.
3. Apply mathematical foundation to solve computational problems in networking.
4. Analyze performance of various communication protocols.
5. Compare routing algorithms.
6. Practice packet/file transmission between nodes.

13. Course: Optical Fiber Communication Laboratory

Course Objectives

1. To understand the basic block diagram of optical fiber communication
2. To study various types of light sources, photodetectors, amplifiers in optical communication
3. To know methods of coupling and connecting techniques of optical fibers
4. To study different types of losses in optical fibers.
5. To know applications of optical fibers.

Course Outcomes (CO's)

After completing the course students will be able to :

1. Explain the types and propagation of light through optical fiber
2. Design a simple optical communication link.
3. Comment on losses in optical fibers
4. Compare the optical fibers and their losses