



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Tamaram(V), Makavarapalem(M), Visakhapatnam-531113

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

PEO'S (Programme Educational Objectives):

PEO 1: Graduates will have demonstrated a thorough grounding in the fundamental principles of Basic Sciences including mathematics, English and other Engineering disciplines, Electrical & Electronics Engineering Subjects and practices convey a professional attitude appropriate for a diverse world community.

PEO 2: Graduates will have undertaken complex problems and developed appropriate technical solutions.

PEO 3: Graduates will be prepared to communicate and work effectively on team based engineering projects and will practise the ethics of their profession consistent with a sense of social responsibility.

PEO 4: Graduates will have demonstrated exposure to emerging and modern technologies to succeed in engineering position in various agencies and also pursue advanced degrees in engineering through lifelong learning to succeed



prediction and modelling to complex engineering activities with an understanding of the limitations.

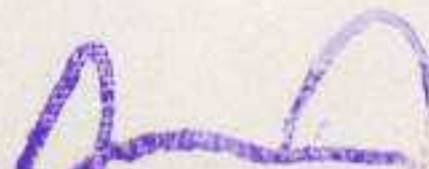
6. **THE ENGINEER AND SOCIETY:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

7. **ENVIRONMENT AND SUSTAINABILITY:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

8. **ETHICS:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

9. **INDIVIDUAL AND TEAM WORK:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

10. **COMMUNICATION:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, give and receive clear instructions.



11. **PROJECT MANAGEMENT AND FINANCE:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments. 12. **LIFE-LONG LEARNING:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Specific Outcome:

Ability to develop Electrical applications and industry based projects





AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Tamaram(V), Makavarapalem(M), Visakhapatnam-531113

DEPARTMENT OF MECHANICAL ENGINEERING

PROGRAMME EDUCATIONAL OBJECTIVES (PEO's)

PEO 1: Graduates will have demonstrated a thorough grounding in the fundamental principles of basic sciences, English other engineering disciplines, Mechanical engineering subjects and practices convey a professional attitude appropriate for a diverse world community.

PEO 2: Graduates will have undertaken complex problems and develop appropriate technical solutions

PEO 3: Graduates will be prepared to communicate and work effectively on team based engineering projects and will practice the ethics of their profession consistent with a series social responsibility,

PEO 4: Graduates will have demonstrated exposure to Emerging and modern technologies to succeed in engineering position in various agencies and also Pursuit advanced degrees in engineering



PROGRAMME OUTCOMES (PO'S)

PO1. Engineering Knowledge: Apply knowledge of mathematics, science and engineering fundamentals and Production and Industrial Engineering specialization to the solution of complex Production and Industrial Engineering problems.

PO2. Problem Analysis: Identify, formulate, research literature and analyze complex Production and Industrial Engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences and engineering sciences.

PO3. Design/ Development of Solutions: Design solutions for complex Production and Industrial Engineering problems and design system components or processes that meet specified needs with appropriate consideration for public health and safety, cultural, societal and environmental considerations.

PO4. Conduct investigations of complex Production and Industrial Engineering problems using research-based knowledge and research methods including analysis, interpretation of data and synthesis of information to provide valid conclusions.

PO5. Modern Tool Usage: To apply appropriate techniques, resources and engineering and IT tools for modeling of different Production and Industrial Engineering problems with an understanding of the limitations.

PO6. The Engineer and Society: Apply contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to professional engineering practice.

PO7. Environment and Sustainability: Understand the impact of professional Production and Industrial Engineering solutions in societal and environmental contexts and demonstrate knowledge of and need for sustainable development.

PO8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of Production and Industrial Engineering practice.

PO9. Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams and in multi disciplinary settings.

PO10. Communication: Communicate effectively on complex Production and Industrial Engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.

PO11. Project Management and Finance: Demonstrate knowledge and understanding of Production and Industrial Engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments

PO12. Life Long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.





AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Tamaram(V), Makavarapalem(M), Visakhapatnam-531113

DEPARTMENT OF ELECTONICS & COMMUNICATION ENGINEERING

PEO's (Program Educational Objectively)

PEO 1: Graduates will have demonstrated a thorough grounding in the fundamental principles of basic sciences including mathematics, English and other Engineering disciplines, Electronics and communications Engineering subjects and practices convey a professional attitude appropriate for a diverse world community.

PEO 2: Graduates will have undertaken complex problems and developed appropriate technical solution.

PEO 3: Graduates will be prepared to communicate and work effectively on team based Engineering projects and will practise the ethics of their profession consistent with a sense of social responsibility.

PEO 4: Graduates will have demonstrated exposure to emerging and modern technologies to succeed in engineering position in various agencies and also pursuate advanced degrees in engineering through lifelong learning to succeed.



PO'S (Programme Outcomes):

1) ENGINEERING KNOWLEDGE:

Apply the knowledge of mathematics, science, Engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

2) PROBLEM ANALYSIS:

Identify, Formulate, Research literature, and analyze complex engineering problems reaching substantiated conclusions using the first principles of mathematics, natural sciences, and engineering sciences.

3) DESIGN/ DEVELOPMENT OF SOLUTIONS:

Design solutions for complex engineering problems and design systems components are processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal and environmental considerations.

4) CONDUCT INVESTIGATIONS OF COMPLEX PROBLEMS

Use research- based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of information to provide valid consideration.



5) MODERN TOOL USAGE:

Create, Select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with and understanding of the limitations.

6) THE ENGINEERING AND SOCIETY:

Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and consequent responsibilities relevant to the professional engineering practise.

7) ENVIRONMENT AND SUSTAINABILITY:

Understand the impact of the professional engineering solutions in societal and environmental context, and demonstrate the knowledge of, and need for sustainable development.

8) ETHICS:

Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practices.

9) INDIVIDUAL AND TEAM WORK:

Function effectively as an individual and as a member or leader in diverse teams and in multi disciplinary setting.



10) COMMUNICATION:

Communicate effectively on complex engineering activities with the engineering communities and with the society at large, such as, being able to comprehend and write effective report and design documentation, make effective presentations, give and receive clear instructions.

11) PROJECT MANAGEMENT AND FINANCE:

Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, has a member and leader in a team, to manage projects and in multi disciplinary environments.

12) LIFE-LONG LEARNING:

Recognize the need for, and have the preparation and ability to engage in independent and life long learning in the broadest context of technological change.



SPECIFIC OUTCOME:

An ability to design and develop innovative electronics and communication system (decided by the department).



I year II semester

English-II

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C110.1	Define education as the greatest resource, model APJ Abdul Kalam as great scientist and utilize grammar in communication.
2	C110.2	Classify different pros and cons of science, label CV Raman biography as great inspiration.
3	C110.3	Out-line and organize cultural issues well, find Homi J Babha is finest scientist and develop good attitude and self-management.
4	C110.4	Compare one culture with other culture and their pros and cons, know how and why one should set a goal.
5	C110.5	Interpret health threats of climate changes and infer PC Ray life history as a model.
6	C110.6	choose and compare Bill Gates as chief software architect and build team work.

Mathematics-III

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C111.1	Determine rank, Matrix inverse solve linear systems and simultaneous equations
2	C111.2	Use the characteristic polynomial to compute the eigen values and eigen vectors of a square matrix and use them to diagonals matrices
3	C111.3	Tracing curves in cartesian and polar form. Determine double integral a region and triple integral over a volume
4	C111.4	Evaluate improper integrals using beta and Gamma functions
5	C111.5	Calculate the gradient of a scalar function ,divergence and curl of a vector function
6	C111.6	Determine line, surface & volume integrals. Apply Greens, Gauss, Stokes theorems to calculate line, surface and volume integrals.

Applied Chemistry

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C112.1	Identify the advantages and limitations of plastic material and their use in design
2	C112.2	Determine the calorific value of fuels, perform flue gas analysis and combustion analysis
3	C112.3	understand the reasons for corrosion and some methods corrosion control and applications of the reaction mechanisms of batteries and fuel cells
4	C112.4	Design the materials like nano materials fullerenes, super conductors and liquid crystals
5	C112.5	Develop innovative methods to produce soft water for industrial use and potable water at cheaper cost.
6	C112.6	Demonstrate the existing future upcoming devices, materials and methodology

Object oriented Programing through C++

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C113.1	Summarize the oops concepts in C++
2	C113.2	Describe the basic concepts of classes and objects
3	C113.3	Develop programs using operating overloading and inheritance
4	C113.4	Create the programs on dynamic polymorphism in C++
5	C113.5	Design the programs on templates and exceptions
6	C113.6	Outline the features of STL



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Tamaram(V), Makavarapalem(M), Visakhapatnam-531113

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

I year I semester

English-I

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C101.1	Illustrate and interpret human resources and their role in an organization or an industry and ideal family relations too.
2	C101.2	Relate and develop transport problems and solutions and also make use of one's life for country safety.
3	C101.3	Recall his/her education to relate contemporary technology its impact and to be model himself/herself as a successful one.
4	C101.4	Identify and explain various alternatives of energy sources and build constructive characteristics to be honest.
5	C101.5	Relate and out-line how many species are in endanger due to human activities and to utilize ones property for nation development
6	C101.6	Utilise industrial training to take safety measure at work.

Mathematics-I

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C102.1	Solve linear differential equations first order
2	C102.2	solve analytically a wide range of higher order ordinary differential equations with constant coefficients
3	C102.3	Determine Laplace transform and inverse Laplace transform of various functions and use Laplace transforms to determine general solution to linear ODE
4	C102.4	Calculate the total derivative, Jacobian and extreme values of a function of two variables
5	C102.5	Solve problems related to basic linear and non-linear partial differential equations
6	C102.6	Solve higher order partially differential equations with constant

coefficients and Classify second order PDE.

Mathematics-II

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C103.1	Calculate a root of algebraic and transcendental equations. Explain relation between the finite Difference operators.
2	C103.2	Compute interpolating polynomial for the given data.
3	C103.3	Solve ordinary differential equations numerically using Euler's and RK method.
4	C103.4	Evaluate Fourier series for certain functions.
5	C103.5	Identify/classify and solve the different types of partial differential equations.
6	C103.6	Evaluate Fourier Transforms and Finite Fourier transforms for certain functions.

Applied physics

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C104.1	Illustrate the principles of interference of light.
2	C104.2	Demonstrate the diffraction of light.
3	C104.3	Apply the concepts of light for optical communication.
4	C104.4	Demonstrate the Principles of sound and its applications in engineering
5	C104.5	Analyze structures and hence the properties of solid state materials and concepts of nuclear energy.
6	C104.6	Classify the Magnetic materials, Dielectric materials and their properties.

C Programing

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C105.1	summarize the basics concepts of computers
2	C105.2	describe the basic concepts of C
3	C105.3	develop programs using control structures
4	C105.4	create the programs using functions in C
5	C105.5	explain the concepts of arrays and strings
6	C105.6	build C programs using files and dynamic memory allocation

Engineering Drawing

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C106.1	To understand use and the application of drawing instruments ,and to construct the polygons, curves and various types of scales
2	C106.2	To Apply orthographic projections and to project the points and lines parallel to one plane and inclined to other.
3	C106.3	To Apply the basic principles projections of the lines inclined to both the planes.
4	C106.4	To understand and draw the projections of the plane inclined to both the planes.
5	C106.5	To analise and draw the projections of the various types of solids in different positions inclined to one of the planes.
6	C106.6	To create object in 3D view through isometric views and able to represent and convert the isometric view to orthographic view and vice versa

English communication skills lab-I

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C107.1	Apply different language functions and phrases at different situations to communicate with people.
2	C107.2	Translate English phonemes into graphemes and graphemes into phonemes.
3	C107.3	Build confidence and develop communication skills with proper pronunciation.

Applied physics lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C108.1	Understanding the principles of light.
2	C108.2	Understanding and applications of behaviour of light.
3	C108.3	Applications of principles of light for optical communications.

C Programing lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C109.1	Compile and execute any C Programme.
2	C109.2	Develop programs on basic concepts in C
3	C109.3	Create programs on arrays functions pointers files.

Environmental Studies

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C114.1	Identify the natural resources and their importance for the sustenance of life and recognize the need to conserve the natural resources. Understand the concept of ecosystem its function in the environment and the need for protecting the producers, consumers in various ecosystems and their role in food web.
2	C114.2	Understanding the biodiversity of India and the threats to biodiversity and conservation practices to protect the biodiversity.
3	C114.3	Identify various attributes of pollution and their impacts and the measures to reduce or control the pollution with waste management.
4	C114.4	Understanding the social issues of the Environmental legislations of India and the first global initiatives towards sustainable Development.
5	C114.5	Understanding about Environmental Assessment and the stages involved in EIA and Environmental Audit.
6	C114.6	Understanding self sustaining green campus with environmental friendly aspects of Energy, water and waste water reuse plantation, rain water harvesting and parking curriculum.

Engineering Mechanics

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C115.1	Analyse an engineering problem using free body diagram concepts & will have the ability to solve for the resultants of any force systems and solve the mechanics problems associated with friction forces
2	C115.2	Apply the static equilibrium conditions in the analysis of structures.
3	C115.3	Gain knowledge on the centroid and centre of gravity of complex rigid bodies
4	C115.4	Gain knowledge on the moment of inertia of complex rigid bodies
5	C115.5	Describe the motion of a particle in terms of its position, velocity and acceleration in different frames of reference and can analyse the forces causing the motion of a particle.
6	C115.6	Apply work, energy, impulse and momentum relationships and can solve problems for a particle in motion.

Engineering chemistry lab

At the end of the course student should be able to

S.no	Course code	CO Statement
1	C116.1	Identify the professional course have practically very little exposure to the lab classes
2	C116.2	Demonstrate the experiments of the volumetric analysis
3	C116.3	Develop to gain technical Knowledge of measuring, operating and testing of chemical instruments

Engineering communication skills lab-2

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C117.1	Choose and apply knowledge to participate in group discussion and debating.
2	C117.2	Develop communication and presentations skills
3	C117.3	Demonstrate appropriate skills and experience in interviews, e-mail, CV writing.

Object oriented Programming through C++ lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C118.1	Compile and execute any C++ Programme.
2	C118.2	Develop programs on basic concepts in C++
3	C118.3	Create programs on oops concepts using c++.

II year I semester

Statistical –R programing

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C201.1	Explain the features of advanced data structures
2	C201.2	Summarise the basics of r-programing
3	C201.3	Apply r- programing on statically data
4	C201.4	Create graphs using r-programing
5	C201.5	Solve the problems on probability distribution
6	C201.6	Solve problems on multiple regression

Mathematical Foundation of Computer Science

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C202.1	solve the problems using predicate logic and predicate calculus
2	C202.2	evaluate the problems in set theory and functions
3	C202.3	evaluate the problems on group theory and number theory
4	C202.4	determine permutations and combinations on data
5	C202.5	solve the various types of recurrence relation
6	C202.6	explain the features of graphs

Digital logic design

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C203.1	Define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation.
2	C203.2	Analyse the different switching algebra theorems and apply them for logic functions.
3	C203.3	Design the K-Map for a few variables and perform the reduction of logic function.
4	C203.4	Design the combinational logic circuits for logic functions and define the HDL models of Combinational circuits.
5	C203.5	Analyse the clocked sequential circuits.
6	C203.6	Design the registers and counters.

Python Programming

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C204.1	summarize the basics of python and scripting languages
2	C204.2	design the python programs using basic concepts
3	C204.3	develop programs using data structures
4	C204.4	create the programs using packages and functions in python
5	C204.5	apply object oriented principles in python
6	C204.6	build Test cases using python

Data structures through c++

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C205.1	summarize the oops concepts and the application of arrays
2	C205.2	apply templates in implementation and application of stacks
3	C205.3	develop programs using linked lists and dictionaries
4	C205.4	design programs on various tree data structures
5	C205.5	apply graph concepts on various algorithms
6	C205.6	Apply various searching and sorting techniques on given data.

COMPUTER GRAPHICS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C206.1	design and implement 2D primitives graphical structures
2	C206.2	create 3D graphical structure
3	C206.3	build graphics program using colour model
4	C206.4	apply different shading techniques on given objects
5	C206.5	develop various curve generating algorithms
6	C206.6	Apply different Boolean operations on surface using ray tracing method.

Data structures through c++ Lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C207.1	design programs on linear data structure
2	C207.2	develop programs on nonlinear data structures
3	C207.3	create programs on searching and sorting

Python programming lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C208.1	design programs on basic concept on python
2	C208.2	develop programs on control flows files DS and functions
3	C208.3	create programs on advanced concept in python

II Year II semester

Software Engineering

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C209.1	demonstrate fundamental of software engineering and various process models
2	C209.2	summarize the formation of SRS document and Software design process
3	C209.3	illustrate the process of function oriented software design and user interface design
4	C209.4	apply coding and testing in software project
5	C209.5	explain the software quality process
6	C209.6	outline the software maintenance and reuse

JAVA Programming

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C210.1	summarize the basic concepts of java
2	C210.2	illustrate the concepts of classes and objects
3	C210.3	explain the concepts of inheritance , packages and exceptions
4	C210.4	design the programs on multi-threading
5	C210.5	develop the programs on Applets
6	C210.6	apply GUI components in Applets

Advanced data structures

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C211.1	design and implement external sorting and merging on given data
2	C211.2	develop various hashing techniques on given data
3	C211.3	explain various priority queues and heaps
4	C211.4	apply various algorithms on efficient binary search trees
5	C211.5	apply various algorithms on efficient multi-way search trees
6	C211.6	develop various algorithms on digital search structures

Computer Organizations

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C212.1	summarise basic structure of computers
2	C212.2	difference between various instructions and addressing modes
3	C212.3	identify various types of instructions
4	C212.4	outline various input output organization in computer
5	C212.5	demonstrate various memories in computer
6	C212.6	explain control unit organization in CPU

Formal Language Automata Theory (FLAT)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C213.1	solve various problems on NFA and DFA
2	C213.2	evaluate regular expressions, regular grammar and conversion of RE and FA
3	C213.3	apply derivations and normal forms on context free grammar
4	C213.4	construct push down automata per given language
5	C213.5	construct Turing machine by using various languages
6	C213.6	identify various classes of problems in Turing machine

Principals of Programming Languages (PPL)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C214.1	summarize the syntax and semantics of programming languages
2	C214.2	demonstrate data types and basic statements of programming languages
3	C214.3	illustrate subprograms and implementations of programming languages
4	C214.4	apply object orientation and event handling on programming languages
5	C214.5	outline the features of functional programming languages
6	C214.6	explain the features of logical programming languages

Advanced Data Structures Lab:

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C215.1	design various operations on various trees
2	C215.2	develop programs on minimum cost spanning trees
3	C215.3	design various algorithms on advanced data structures

Java Programming Lab:

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C216.1	develop programs using oops concepts in java
2	C216.2	design programs on threads and exceptions
3	C216.3	build GUI applications in java

III year I semester

Compiler design

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C301.1	summarise the process of compilation
2	C301.2	develop various top down parsers for given CFG
3	C301.3	build various types of bottom up parsers for given CFG
4	C301.4	illustrate the process of semantic analysis
5	C301.5	explain various implementations of symbol tables and the role of code generation phase in compiler design
6	C301.6	outline various code optimisation techniques.

UNIX Programming

S.No	Course code	CO Statement
1	C302.1	summarize the features of various utilities of the unix
2	C302.2	describe the features of the Unix file system
3	C302.3	develop the programs using shell script
4	C302.4	illustrate the features of filters
5	C302.5	outline the basic characteristics of shell script
6	C302.6	design the programs on process management

Object Oriented Analysis and design using UML

At the end of the course student should be able

S.No	Course code	CO Statement
1	C303.1	develop the complex systems for modelling
2	C303.2	demonstrate the relation-ship between classes and objects.
3	C303.3	summarize the basic concepts of UML.
4	C303.4	design behavioural diagrams of the projects.
5	C303.5	construct advanced behavioural diagrams for projects.
6	C303.6	apply UML diagrams on real time applications.

Data Base Management systems

At the end of the course student should be able

S.No	Course code	CO Statement
1	C304.1	Summarise the fundamentals and architecture of DBMS
2	C304.2	Design ER models for real time applications
3	C304.3	Apply SQL Queries, Triggers and cursors on active database
4	C304.4	Apply various normal forms on databases
5	C304.5	Apply Transaction management and concurrency control on databases
6	C304.6	Analyse the storage and indexing in databases.

Operating systems

At the end of the course student should be able

S.No	Course code	CO Statement
1	C305.1	summarise the basic concepts of operating systems
2	C305.2	Apply various scheduling algorithms on process
3	C305.3	Illustrate memory management and apply page replacement algorithms in memory
4	C305.4	Explain the principles of concurrency and apply the principles of deadlocks on process and resourses
5	C305.5	Explain the file system implementation and its interface
6	C305.6	outline the features of LINUX and ANDROID

Unified modelling lab

At the end of the course student should be able

S.No	Course code	CO Statement
1	C306.1	construct Use case view and Design view for real time applications
2	C306.2	design implementation view and process view for real time applications
3	C306.3	develop architectural view for real time applications

Operating systems and Linux programing lab

At the end of the course student should be able

S.No	Course code	CO Statement
1	C307.1	develop stimulation programs for various operating systems features(Scheduling, deadlock, page replacements etc.,)
2	C307.2	design Shell programs in LINUX environment
3	C307.3	develop programs for various system calls and operating system features in LINUX environment

Data base management systems lab

At the end of the course student should be able

S.No	Course code	CO Statement
1	C308.1	apply SQL Queries on a given relation
2	C308.2	develop programs using PL/SQL
3	C308.3	design Triggers and Cursors for a given database

III year II semester

Computer Networks

At the end of the course student should be able

S.No	Course code	CO Statement
1	C309.1	Compare and contrast between OSI and TCP reference models
2	C309.2	Interpret the features and issues present in Physical and Data link layer
3	C309.3	Apply Error control and Flow control on given data format
4	C309.4	Analyse the features of MAC layer
5	C309.5	Apply various routing algorithms in Network layer to route the packet
6	C309.6	Explain the features of Application and Transport layer

Data warehousing and data mining

At the end of the course student should be able

S.No	Course code	CO Statement
1	C310.1	Summarise the basic concepts of data mining
2	C310.2	Explain the process of pre-processing the data
3	C310.3	Describe the process of building data warehouse
4	C310.4	Apply classification techniques on data source
5	C310.5	illustrate the alternative classification techniques on data
6	C310.6	apply clustering algorithms on given data

Design Analysis of Algorithms

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C311.1	evaluate Time complexity and space complexity of various algorithm
2	C311.2	design and evaluate various divide and conquer algorithms
3	C311.3	develop analyse various greedy methods algorithms
4	C311.4	create and analyse various dynamic programming algorithms
5	C311.5	analyse different back tracking algorithms
6	C311.6	analyse different branch and bound algorithms

Software Testing Methodologies

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C312.1	Illustrate the purpose of testing and path testing
2	C312.2	Outline the Basics of testing
3	C312.3	demonstrate Domain testing and path testing
4	C312.4	adopt syntax and logic based testing techniques
5	C312.5	Summarize state graphs and transition testing
6	C312.6	apply automated software testing tools to execute test cases

Cyber security (Elective)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C313.1	Summarise various types of Cyber crimes
2	C313.2	Demonstrate various Cyber offences
3	C313.3	outline the features of Cyber Crime in mobiles and wireless devices
4	C313.4	Explain various tools and methods used in Cyber crime
5	C313.5	List various Cyber laws in Indian IT act
6	C313.6	Examine the features of Computer forensics

Network Programing lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C314.1	design programs on various networking system calls in Linux
2	C314.2	develop programs on routing algorithms
3	C314.3	design programs on socket system calls

Software testing lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C315.1	Interpret the failures in given piece of code
2	C315.2	design test cases, test plans for web applications
3	C315.3	develop test cases using automated tools

Data warehousing and data mining lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C316.1	apply data pre-processing on given data set using weka tool
2	C316.2	apply classification and association rule mining on given data set using weka tool
3	C316.3	apply clustering algorithms on given data set using weka tool

IV year I semester

Cryptography and Network security

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C401.1	explain the basic principles of information security
2	C401.2	apply symmetric encryption techniques on information
3	C401.3	apply Asymmetric encryption techniques on information
4	C401.4	apply data integrity, digital signature, on messages
5	C401.5	explain the features of PGP SMIME
6	C401.6	illustrate the features of ipsecurity

Software architecture and design patterns

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C402.1	explain various features of software architecture
2	C402.2	Analyse the software architectures
3	C402.3	outline the features of design patterns
4	C402.4	illustrate the features of structural patterns
5	C402.5	summarise the features of behavioural patterns
6	C402.6	apply design patterns on web applications and document editor

Web Technologies

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C403.1	create web pages using HTML and CSS
2	C403.2	design programs to validate HTML pages using java script
3	C403.3	demonstrate the features of DOM and SAX
4	C403.4	develop programs using PHP
5	C403.5	develop programs on Ruby basics
6	C403.6	design programs on Ruby

Managerial Economics and Financial Analysis

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C404.1	understand nature of managerial economics and analyse demand and supply concept
2	C404.2	apply break even analysis on productions
3	C404.3	familiarise with different marketing strategies on prices
4	C404.4	explain business and phases of business life cycle
5	C404.5	apply different technical accounting statements to various rating
6	C404.6	explain budgets and its applications

Mobile Computing(Elective)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C405.1	explain the features of Mobile computing
2	C405.2	summarise the features of MAC layer.
3	C405.3	outline the features of Mobile network layer
4	C405.4	illustrate the features of mobile transport layer
5	C405.5	summarise the features of data dissemination and synchronization
6	C405.6	explain the features of MANET and protocols and platforms used for mobile computing

Cloud Computing(Elective)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C406.1	Understanding the key dimensions of the challenge of CloudComputing
2	C406.2	Assessment of the economics , financial, and technological implications for selecting cloud computing for ownorganization
3	C406.3	Assessing the financial, technological, and organizational capacity of employer's for actively initiating and installing cloud-basedapplications
4	C406.4	Assessment of own organizations' needs for capacity building and training in cloud computing-related ITareas
5	C406.5	demonstrate the cloud resource management
6	C406.6	describe the storage systems in cloud

Software Architecture and Design Patterns lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C407.1	apply software architecture principles on Real time applications
2	C407.2	apply software structural behavioural patterns on library management systems
3	C407.3	design chain responsibilities for design pattrens

Web Technologies lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C408.1	design static web pages and validate them with a scripting language
2	C408.2	develop programs using Ruby
3	C408.3	build dynamic web pages using PHP

IV year II semester

Distributed Systems

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C409.1	summarise the characteristics of distributed systems
2	C409.2	outline the features of inter process communication in DS
3	C409.3	apply Distributed objects and remote invocation in java RMI
4	C409.4	explain the operating system support for DS
5	C409.5	illustrate the features of distributed file system
6	C409.6	explain the role of Transaction and replications in DS

Management Science

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C410.1	understand nature of managerial economics and analyse demand and supply concept
2	C410.2	apply break even analysis on productions
3	C410.3	familiarise with different marketing strategies on prices
4	C410.4	explain business and phases of business life cycle
5	C410.5	apply different technical accounting statements to various rating
6	C410.6	explain budgets and its applications

Machine learning

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C411.1	explain the role of machine learning in real time applications
2	C411.2	illustrate the problems in machine learning
3	C411.3	various machine learning algorithms
4	C411.4	apply machine learning algorithms on data
5	C411.5	apply machine learning algorithms on vector machines
6	C411.6	apply machine learning algorithms on data regression

Concurrent and parallel programming(Elective)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C412.1	differentiate the concurrent and sequential processing
2	C412.2	demonstrate the applications of process and threads
3	C412.3	apply parallel algorithms on data
4	C412.4	describe parallel programming paradigm
5	C412.5	explain about parallel programming languages
6	C412.6	explain heterogeneous computing





AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Tamaram(V), Makavarapalem(M), Visakhapatnam-531113

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE OUTCOMES (R-19)

I Year - I Semester

C Programming

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1101	To write algorithms and to draw flowcharts for solving problems
2	ES1101	To convert flowcharts/algorithms to C Programs, compile and debug programs
3	ES1101	To use different operators, data types and write programs that use two-way/multi-way selection
4	ES1101	To select the best loop construct for a given problem
5	ES1101	To design and implement programs to analyze the different pointer applications
6	ES1101	To decompose a problem into functions and to develop modular reusable code To apply File I/O operations

C Programming lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1102	Gains Knowledge on various concepts of a C language.
2	ES1102	Able to draw flowcharts and write algorithms.
3	ES1102	Able design and development of C problem solving skills

I Year - II Semester

NETWORK ANALYSIS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1209	Gain the knowledge on basic network elements
2	ES1209	Analyze the RLC circuits behaviour in detailed.
3	ES1209	analyze the performance of periodic waveforms
4	ES1209	Gain the knowledge in characteristics of two port network parameters (Z,Y,ABCD,h &g).
5	ES1209	analyze the filter design concepts in real world applications.

BASIC ELECTRICAL ENGINEERING

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1211	Able to explain the operation of DC generator and analyze the characteristics of DC generator.
2	ES1211	Able to explain the principle of operation of DC motor and analyze their characteristics. Acquire the skills to analyze the starting and speed control methods of DCmotors.
3	ES1211	Ability to analyze the performance and speed – torque characteristics of a 3-phase induction motor and understand starting methods of 3-phase induction motor.
4	ES1211	Able to explain the operation of Synchronous Machines
5	ES1211	Capability to understand the operation of various special machines.

BASIC ELECTRICAL ENGINEERING LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1208	Determine and predetermine the performance of DC machines and transformers
2	ES1208	Control the DC shunt machines.
3	ES1208	Compute the performance of 1-phasetransformer

II year I semester

ELECTRONIC DEVICES AND CIRCUITS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C201.1	Apply the basic concepts of semiconductor physics.
2	C201.2	Understand the formation of p-n junction and how it can be used as a p-n junction as diode in different modes of operation.
3	C201.3	Know the construction, working principle of rectifiers with and without filters with relevant expressions and necessary comparisons.
4	C201.4	Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations
5	C201.5	Understand the construction, principle of operation of transistors, BJT and FET with their V-I characteristics in different configurations. Perform the analysis of small signal low frequency transistor amplifier circuits using BJT and FET in different configurations.

SWITCHING THEORY and LOGIC DESIGN

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C202.1	Classify different number systems and apply to generate various codes.
2	C202.2	Use the concept of Boolean algebra in minimization of switching functions
3	C202.3	Design different types of combinational logic circuits
4	C202.4	Apply knowledge of flip-flops in designing of Registers and counters
5	C202.5	The operation and design methodology for synchronous sequential circuits and algorithmic state machines

SIGNALS and SYSTEMS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C203.1	Differentiate the various classifications of signals and systems
2	C203.2	Analyze the frequency domain representation of signals using Fourier concepts
3	C203.3	Classify the systems based on their properties and determine the response of LTI Systems.
4	C203.4	Know the sampling process and various types of sampling techniques.
5	C203.5	Apply Laplace and z-transforms to analyze signals and Systems (continuous & discrete).

RANDOM VARIABLES and STOCHASTIC PROCESSES

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C204.1	Mathematically model the random phenomena and solve simple probabilistic problems.
2	C204.2	Identify different types of random variables and compute statistical averages of these random variables
3	C204.3	Characterize the random processes in the time and frequency domains.
4	C204.4	Analyze the LTI systems with random inputs.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C205.1	Show competence in the use of the Java programming language in the development of small to medium sized application programs that demonstrate professionally acceptable coding and performance standard
2	C205.2	Illustrate the basic principles of the object-oriented programming
3	C205.3	Demonstrate an introductory understanding of graphical user interfaces, multithreaded programming, and event-driven programming

MANAGERIAL ECONOMICS & FINANCIAL ANALYSIS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C206.1	The Learner is equipped with the knowledge of estimating the Demand and demand elasticity's for a product
2	C206.2	The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least cost combination of inputs
3	C206.3	The pupil is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
4	C206.4	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis.
5	C206.5	The Learner can able to evaluate various investment project proposals with the help of capital budgeting techniques for decision making.

ELECTRONIC DEVICES AND CIRCUITS LAB

At the end of the course student should be able to

S.no	Course code	CO Statement
1	C207.1	Observing the characteristics of different types of diodes and uses
2	C207.2	BJT Characteristics(CE Configuration), Input Characteristics, Output Characteristics, FET Characteristics(CS Configuration), Drain Characteristics, Transfer Characteristics, SCR Characteristics, UJT Characteristics, Transistor Biasing
3	C207.3	Analysing the function of CRO, Rectifiers, BJT-CE Amplifier, Emitter Follower-CC Amplifier, FET-CS Amplifier.

SWITCHING THEORY and LOGIC DESIGN LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C208.1	Analysing the working nature of all logic gates and brief understanding of simple combinational circuit.
2	C208.2	Observing the functionalities of decoders, multiplexers, de multiplexers, half adders and full adders.
3	C208.3	Verifying operation modes of shift registers and all types of flip flops

II Year II semester

ELECTRONIC CIRCUIT ANALYSIS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C209.1	Design and analysis of small signal high frequency transistor amplifier using BJT and FET.
2	C209.2	Design and analysis of multistage amplifiers using BJT and FET and Differential amplifier using BJT
3	C209.3	Derive the expressions for frequency of oscillation and condition for oscillation of RC and LC oscillators and their amplitude and frequency stability concept.
4	C209.4	Know the classification of the power and tuned amplifiers and their analysis with performance comparison.

LINEAR CONTROL SYSTEMS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	C210.1	This course introduces the concepts of feedback and its advantages to various control systems
2	C210.2	The performance metrics to design the control system in time-domain and frequency domain are introduced.
3	C210.3	Control systems for various applications can be designed using time-domain and frequency domain analysis
4	C210.4	In addition to the conventional approach, the state space approach for the analysis of control systems is also introduced.

ELECTROMAGNETIC WAVES and TRANSMISSION LINES

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C211.1	Determine E and H using various laws and applications of electric & magnetic fields
2	C211.2	Apply the Maxwell equations to analyze the time varying behaviour of EMwaves
3	C211.3	Gain the knowledge in uniform plane wave concept and characteristics of uniform plane wave invarious media
4	C211.4	Calculate Brewster angle, critical angle and total internal reflection
5	C211.5	Derive and Calculate the expressions for input impedance of transmission lines, reflection coefficient, VSWR etc. using smith chart

ANALOG COMMUNICATIONS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C212.1	Differentiate various Ana log modulation and demodulation schemes and their spectral characteristics
2	C212.2	Analyze noise characteristics of various analog modulation methods
3	C212.3	Analyze various functional blocks of radio transmitters and receivers
4	C212.4	Design simple analog systems for various modulation techniques

COMPUTER ARCHITECTURE and ORGANIZATION

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C213.1	Students can understand the architecture of modern computer.
2	C213.2	They can analyze the Performance of a computer using performance equation
3	C213.3	Understanding of different instruction types.
4	C213.4	Students can calculate the effective address of an operand by addressing modes
5	C213.5	They can understand how computer stores positive and negative numbers.

MANAGEMENT and ORGANISATIONAL BEHAVIOUR

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C214.1	After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational structure.
2	C214.2	Will familiarize with the concepts of functional management that is HRM and Marketing of new product developments.
3	C214.3	The learner is able to think in strategically through contemporary management practices
4	C214.4	The learner can develop positive attitude through personality development and can equip with motivational theories.
5	C214.5	The student can attain the group performance and grievance handling in managing the organizational culture.

ELECTRONIC CIRCUIT ANALYSIS LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C215.1	Attaining brief study on feedback amplifiers and oscillators
2	C215.2	Operational analysis of Power amplifiers and Voltage amplifiers

ANALOG COMMUNICATIONS LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C216.1	Performing actions on different modulation and demodulation techniques.
2	C216.2	Verification of sampling theorem and Pulse Amplitude Modulation & Demodulation, PWM, PPM - Modulation & Demodulation, PLL IC-565 as FM demodulator.
3	C216.3	Analysing the Radio receiver characteristics and M. Radio Receiver/TV Receiver Demo kits or Trainees.

III year I semester

LINEAR INTEGRATED CIRCUITS and APPLICATIONS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C301.1	Design circuits using operational amplifiers for various applications
2	C301.2	Analyze and design amplifiers and active filters using Op-amp.
3	C301.3	Diagnose and trouble-shoot linear electronic circuits.
4	C301.4	Understand the gain-bandwidth concept and frequency response of the amplifier configurations.
5	C301.5	Understand thoroughly the operational amplifiers with linear integrated circuits

MICROPROCESSOR AND MICROCONTROLLERS

S.No	Course code	CO Statement
1	C302.1	Understand the architecture of microprocessor/ microcontroller and their operation.
2	C302.2	Demonstrate programming skills in assembly language for processors and Controllers.
3	C302.3	Analyze various interfacing techniques and apply them for the design of processor/Controller based systems.

DIGITAL COMMUNICATIONS

At the end of the course student should be able

S.No	Course code	CO Statement
1	C303.1	Analyze the performance of a Digital Communication System for probability of error and are able to design a digital communication system.
2	C303.2	Analyze various source coding techniques.
3	C303.3	Compute and analyze Block codes, cyclic codes and convolution codes.
4	C303.4	Design a coded communication system

ELECTRONIC MEASUREMENTS & INSTRUMENTATION

At the end of the course student should be able

S.No	Course code	CO Statement
1	C304.1	Select the instrument to be used based on their requirements.
2	C304.2	Understand and analyze different signal generators and analyzers.
3	C304.3	Understand the design of oscilloscopes for different applications.
4	C304.4	Design different transducers for measurement of different parameters

DATASTRUCTURES and ALGORITHMS

At the end of the course student should be able

S.No	Course code	CO Statement
1	C305.1	Demonstrate analytical comprehension of concepts such as abstract data types
2	C305.2	Analyze various generic programming techniques
3	C305.3	Compare various sorting algorithms and perform their efficiency analysis.
4	C305.4	Demonstrate the ability to analyze, design, apply and use data structures and algorithms to solve engineering problems and evaluate their solutions.
5	C305.5	Demonstrate the ability of using generic principles for data representation & manipulation with a view for efficiency, maintainability, and code-reuse.

LINEAR INTEGRATED CIRCUITS and APPLICATIONS LAB

At the end of the course student should be able

S.No	Course code	CO Statement
1	C306.1	Complete study on Operational Amplifier with its parameters, specifications and applications.
2	C306.2	Brief analysis of all types of filters, Integrator, Differentiator circuits and Oscillators.
3	C306.3	Verifying the working of 555 timer, Schmitt Trigger Circuits and Shunt capacitance filters.

DIGITAL COMMUNICATIONS LAB

At the end of the course student should be able

S.No	Course code	CO Statement
1	C307.1	Analysis on Time division multiplexing, Pulse code modulation, Differential pulse code modulation, Delta modulation,
2	C307.2	Observing different types of keying mechanisms like Frequency shift keying, Phase shift keying, Differential phase shift keying, Companding
3	C307.3	Observing the working of Source Encoder and Decoder, Linear Block Code-Encoder and Decoder, Binary Cyclic Code - Encoder and Decoder Convolution Code - Encoder and Decoder, BCH Codes.

MICROPROCESSOR and MICROCONTROLLERS LAB

At the end of the course student should be able

S.No	Course code	CO Statement
1	C308.1	Performing 16 -bit arithmetic operations on kit.
2	C308.2	Sorting an array, Program for Factorial of given n-numbers, Interfacing ADC to8086, Interfacing DAC to8086, Interfacing stepper motor to8086.
3	C308.3	Getting brief knowledge on 8051 microcontroller.

MINI PROJECT WITH HARDWARE DEVELOPMENT

At the end of the course student should be able

S.No	Course code	CO Statement
1	C308.1	Student should be aware of components
2	C308.2	Student should learn basic programming languages
3	C308.3	A brief document should be prepared

III year II semester

WIRED and WIRELESS TRANSMISSION DEVICES

At the end of the course student should be able

S.No	Course code	CO Statement
1	C309.1	Identify basic antenna parameters.
2	C309.2	Design and analyze wire antennas, loop antennas, reflector antennas, lens antennas, horn antennas and micro strip antennas
3	C309.3	Quantify the fields radiated by various types of antennas
4	C309.4	Design and analyze antenna arrays
5	C309.5	Analyze antenna measurements to assess antenna's performance

VLSI DESIGN

At the end of the course student should be able

S.No	Course code	CO Statement
1	C310.1	Demonstrate a clear understanding of CMOS fabrication flow and technology scaling
2	C310.2	Apply the design Rules and draw layout of a given logic circuit.
3	C310.3	Design MOSFET based logic circuit.
4	C310.4	Design basic building blocks in Analog IC design.
5	C310.5	Design various CMOS logic circuits for design of Combinational logic circuits.

DIGITAL SIGNAL PROCESSING

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C311.1	Formulate engineering problems in terms of DSP operations
2	C311.2	Analyze digital signals and systems
3	C311.3	Analyze discrete time signals in frequency domain
4	C311.4	Design digital filters and implement with different structures
5	C311.5	Understand the key architectural

ELECTIVE

BIO MEDICAL ENGINEERING

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C312.1	Has an in-depth knowledge of the methodological-operational aspects of mathematical disciplines, basic sciences and information engineering.
2	C312.2	These skills are partly guaranteed by the access criteria and partly acquired through the scientific disciplines belonging to the related and integrative fields listed in the table of training activities.
3	C312.3	Have a broad understanding of the applications of various sensors and transducers available for physiological and cellular measurements, Understand fundamental transduction and biosensing principles, Get the clear domain knowledge about various measurement systems includes different types of sensors, electrodes, signal conditioning circuits for acquiring and recording various physiological parameters, Understand various measurement devices and techniques, including the underlying biological processes that generate the quantities to be measured or controlled, Be capable of critically reviewing the literature in the application area and apply knowledge gained from the course to analyse simple bio sensing and transduction problems.
4	C312.4	1. Describe and characterize the sources of biomedical signals and needs of using biomedical instruments & their limitations. 2. Understand & describe pc based medical instrumentation & regulation of medical devices. 3. Describe and characterize medical instruments as per their specifications, static & dynamic characteristics and understand data acquisition system.

EMBEDDED SYSTEMS OPEN ELECTIVE

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C313.1	Understand the basic concepts of an embedded system and able to know an embedded.
2	C313.2	The hardware components required for an embedded system and the design approach of an embedded hardware.
3	C313.3	System design approach to perform a specific function.
4	C313.4	The various embedded firmware design approaches on embedded environment.
5	C313.5	Understand how to integrate hardware and firmware of an embedded system using real time operating system.

INTERNET OF THINGS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C314.1	Understand internet of Things and its hardware and software components
2	C314.2	Interface I/O devices, sensors & communication modules.
3	C314.3	Remotely monitor data and control devices
4	C314.4	Design real time IoT based applications

VLSI LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C315.1	The students need to develop Verilog /VHDL Source code, perform simulation using relevant simulator and analyze the obtained simulation results using necessary Synthesizer.
2	C315.2	All the experiments need to be implemented on the latest FPGA/CPLD Hardware in the Laboratory. Back-end Level Design and Implementation
3	C315.3	The students need to design the following experiments at schematic level using CMOS logic and verify the functionality. Further students need to draw the corresponding layout and verify the functionality including parasites. Available state of the art technology libraries can be used while simulating the designs using Industry standard EDA Tools.

DIGITAL SIGNAL PROCESSING LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C316.1	Students has to know about the software MATLAB
2	C316.2	Students have to observe different types of convolution codes by using code composer studio.
3	C316.3	Some of the Experiments are to be done using a TI DSP Starter Kit.

IV year I semester

MICROWAVE and OPTICAL COMMUNICATION ENGINEERING

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C401.1	Design different modes in wave guide structures
2	C401.2	Calculate S-matrix for various waveguide components and splitting the microwave energy in a desired direction
3	C401.3	Distinguish between Microwave tubes and Solid State Devices, calculation of efficiency devices.
4	C401.4	Measure various microwave parameters using a Microwave test bench

DATA COMMUNICATIONS & COMPUTER NETWORKS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C402.1	Know the Categories and functions of various Data communication Networks
2	C402.2	Design and analyze various error detection techniques.
3	C402.3	Demonstrate the mechanism of routing the data in network layer
4	C402.4	Know the significance of various Flow control and Congestion control Mechanisms
5	C402.5	Know the Functioning of various Application layer Protocols.

DIGITAL IMAGE and VIDEO PROCESSING

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C403.1	Defining the digital image, representation of digital image, importance of image resolution, applications in image processing.
2	C403.2	Know the advantages of representation of digital images in transform domain, application of various image transforms.
3	C403.3	Know how an image can be enhanced by using histogram techniques, filtering techniques etc
4	C403.4	Understand image degradation, image restoration techniques using spatial filters and frequency domain
5	C403.5	Know the detection of point, line and edges in images, edge linking through local processing, global processing.

ELECTIVE 4**EMBEDDED SYSTEMS**

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C313.1	Understand the basic concepts of an embedded system and able to know an embedded.
2	C313.2	The hardware components required for an embedded system and the design approach of an embedded hardware.
3	C313.3	System design approach to perform a specific function.
4	C313.4	The various embedded firmware design approaches on embedded environment.
5	C313.5	Understand how to integrate hardware and firmware of an embedded system using real time operating system.

INTERNET OF THINGS LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C406.1	Student has to aware of Internet concepts, required protocols for communication
2	C406.2	Level of understanding the latest trends and technology in IOT
3	C406.3	Learning about the required software and protocols for communication of data
4	C406.4	Identifying the different communication devices in the embedded market
5	C406.5	Practising to get the positive outcomes for required output
6	C406.6	Need to understand the embedded c language

MICROWAVE AND OPTICAL COMMUNICATION ENGINEERING LAB

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C407.1	Analysing the Characteristics of Reflex Klystron, Gunn diode, Directional Coupler. Attenuation Measurement.
2	C407.2	Student got an idea on basic principles and basic construction of antennas
3	C407.3	Student can get knowledge on Impedance and Frequency Measurement, Scattering parameters of Circulator, Scattering parameters of Magic Tee, Radiation Pattern of Horn and Parabolic Antennas, Synthesis of Microstrip antennas (Rectangular Structure) Using any Industry standard Simulation Software.

IV YEAR-II SEMESTER

Concurrent and parallel programming (Elective)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	C412.1	Differentiate the concurrent and sequential processing
2	C412.2	Demonstrate the applications of process and threads
3	C412.3	Apply parallel algorithms on data
4	C412.4	Describe parallel programming paradigm
5	C412.5	Explain about parallel programming languages
6	C412.6	Explain heterogeneous computing

HOD

Principal



AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOGY

Tamaram(V), Makavarapalem(M), Visakhapatnam-531113

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE OUTCOME (R-19)

1st Year first Semester :

Mathematics-I

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1101	utilize mean value theorems to real life problems
2	BS1101	solve the differential equations related to various engineering fields
3	BS1101	familiarize with functions of several variables which is useful in optimization
4	BS1101	Apply double integration techniques in evaluating areas bounded by region
5	BS1101	students will also learn important tools of calculus in higher dimensions. Students will become familiar with 2- dimensional and 3-dimensional coordinate systems

Mathematics – II

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1102	develop the use of matrix algebra techniques that is needed by engineers for practical applications
2	BS1102	solve system of linear algebraic equations using Gauss elimination, Gauss Jordan, Gauss Seidel
3	BS1102	evaluate approximating the roots of polynomial and transcendental equations by different algorithm
4	BS1102	apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals
5	BS1102	apply different algorithms for approximating the solutions of ordinary differential equations to its analytical computations (L3)

Engineering Physics :

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1108	explain how sound is propagated in buildings
2	BS1108	analyze acoustic properties of buildings
3	BS1108	recognize sound level disruptors and their use in buildings
4	BS1108	Use of ultrasonics in flaw detection and their use in architectural acoustic
		Use of ultrasonics in flaw detection using NDT technique

PROGRAMMING FOR PROBLEM SOLVING USING C

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1101	To write algorithms and to draw flowcharts for solving problems
2	ES1101	To convert flowcharts/algorithms to C Programs, compile and debug programs
3	ES1101	To use different operators, data types and write programs that use two-way/ multi-way selection
4	ES1101	To select the best loop construct for a given problem
5	ES1101	To design and implement programs to analyze the different pointer applications
6	ES1101	To decompose a problem into functions and to develop modular reusable code

Engineering Drawing :

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1103	The student will learn how to visualize 2D & 3D objects.

PROGRAMMING FOR PROBLEM SOLVING USING C LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1102	Gains Knowledge on various concepts of a C language.
2	ES1102	Able to draw flowcharts and write algorithms.
3	ES1102	Able design and development of C problem solving skill

1st Year 2nd semester :

ENGLISH

At the end of the course student should be able to

Sno	Course code	CO Statement
1	HS1201	understand social or transactional dialogues spoken by native speakers of English and identify the context, topic, and pieces of specific information
2	HS1201	ask and answer general questions on familiar topics and introduce oneself/others
3	HS1201	employ suitable strategies for skimming and scanning to get the general idea of a text and locate specific information
4	HS1201	recognize paragraph structure and be able to match beginnings/endings/headings with paragraphs
5	HS1201	form sentences using proper grammatical structures and correct word forms

ENGINEERING CHEMISTRY

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1210	Outline the properties of polymers and various additives added and different methods of forming plastic materials.
2	BS1210	Explain the theory of construction of battery and fuel cells
3	BS1210	Explain the techniques that detect and measure changes of state of reaction.
4	BS1210	Differentiate petroleum, petrol, synthetic petrol and have knowledge how they are produced.
5	BS1210	Explain the impurities present in raw water, problems associated with them and how to avoid.

ENGINEERING MECHANICS

At the end of the course student should be able

Sno	Course code	CO Statement
1	BS1204	The student should be able to draw free body diagrams for FBDs for particles and rigid bodies in plane and space and problems to solve the unknown forces, orientations and geometric parameters
2	BS1204	He should be able to determine centroid for lines, areas and center of gravity for volumes and their composites
3	BS1204	He should be able to determine area and mass moment of inertia for composite sections
4	BS1204	He should be able to analyze motion of particles and rigid bodies and apply the principles of motion, work energy and impulse – momentum.

BASIC ELECTRICAL & ELECTRONICS ENGINEERING

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1206	Analyse various electrical networks.
2	ES1206	Understand operation of DC generators, 3-point starter and DC machine testing by Swinburne's Test and Brake test.
3	ES1206	Analyse performance of single-phase transformer and acquire proper knowledge and working of 3-phase alternator and 3-phase induction motors.
4	ES1206	Analyse operation of half wave, full wave bridge rectifiers and OP-AMPS..

COMPUTER AIDED ENGINEERING DRAWING

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1207	Student get exposed on working of sheet metal with help of development of surfaces
2	ES1207	Student understands how to know the hidden details of machine components with the help of sections and interpenetrations of solids
3	ES1207	Student shall exposed to modeling commands for generating 2D and 3D objects using computer aided drafting tools which are useful to create machine elements for computer aided analysis.

ENGINEERING CHEMISTRY LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS1211	The students entering into the professional course have practically very little exposure to lab classes. The experiments introduce volumetric analysis; redox titrations with different indicators; EDTA titrations; then they are exposed to a few instrumental methods of chemical analysis. Thus at the end of the lab course, the student is exposed to different methods of chemical analysis and use of some commonly employed instruments. They thus acquire some experimental skills.

BASIC ELECTRICAL & ELECTRONICS ENGINEERING LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1208	Compute the efficiency of DC shunt machine without actual loading of the machine.
2	ES1208	Estimate the efficiency and regulation at different load conditions and power factors for single phase transformer with OC and SC tests.
3	ES1208	Pre-determine the regulation of an alternator by synchronous impedance method.

Engineering exploration Project :

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PR1201	
2	PR1201	
3	PR1201	

II Year I semester

VECTOR CALCULUS & FOURIER TRANSFORMS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BSC	<ul style="list-style-type: none"> • Interpret the physical meaning of different operators such as gradient, curl and divergence (L5) • Estimate the work done against a field, circulation and flux using vector calculus (L5)
2	BSC	<ul style="list-style-type: none"> • Apply the Laplace transform for solving differential equations (L3). • Find or compute the Fourier series of periodic signals (L3)
3	BSC	<ul style="list-style-type: none"> • Know and be able to apply integral expressions for the forwards and inverse Fourier transform to a range of non-periodic waveforms (L3) • Identify solution methods for partial differential equations that model physical processes (L3)

MECHANICS OF SOLIDS

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PCC-ME	Model & Analyze the behavior of basic structural members subjected to various loading and support conditions based on principles of equilibrium
2	PCC-ME	Understand the apply the concept of stress and strain to analyze and design structural members and machine parts under axial, shear and bending loads, moment and torsional moment.
3	PCC-ME	Students will learn all the methods to analyze beams, columns, frames for normal, shear, and torsion stresses and to solve deflection problems in preparation for the design of such structural components. Students are able to analyse beams and draw correct and complete shear and bending moment diagrams for beams.
4	PCC-ME	Students attain a deeper understanding of the loads, stresses, and strains acting on a structure and their relations in the elastic behavior
5	PCC-ME	Design and analysis of Industrial components like pressure vessels

MATERIALS SCIENCE & METALLURGY

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	Understand the crystalline structure of different metals and study the stability of phases in different alloy systems.
2	PCC-ME	Study the behavior of ferrous and non ferrous metals and alloys and their application in different domains.
3	PCC-ME	Able to understand the effect of heat treatment, addition of alloying elements on properties of ferrous metals
4	PCC-ME	Grasp the methods of making of metal powders and applications of powder metallurgy
5	PCC-ME	Comprehend the properties and applications of ceramic, composites and other advanced methods

PRODUCTION TECHNOLOGY

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	: Able to design the patterns and core boxes for metal casting processes
2	PCC-ME	Able to design the gating system for different metallic components
3	PCC-ME	Know the different types of manufacturing processes
4	PCC-ME	Be able to use forging, extrusion processes
5	PCC-ME	Learn about the different types of welding processes used for special fabrication

THERMODYNAMICS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	: Basic concepts of thermodynamics
2	PCC-ME	Laws of thermodynamics
3	PCC-ME	Concept of entropy
4	PCC-ME	Property evaluation of vapors and their depiction in tables and charts
5	PCC-ME	Evaluation of properties of perfect gas mixtures.

KINEMATICS OF MACHINERY

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	Contrive a mechanism for a given plane motion with single degree of freedom.
2	PCC-ME	Suggest and analyze a mechanism for a given straight line motion and automobile steering motion
3	PCC-ME	Analyze the motion (velocity and acceleration) of a plane mechanism.
4	PCC-ME	Suggest and analyze mechanisms for a prescribed intermittent motion like opening and closing of IC engine valves etc.
5	PCC-ME	Select a power transmission system for a given application and analyze motion of different transmission system

APPLIED THERMODYNAMICS

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	Expected to learn the working of steam power cycles and also should be able to analyze and evaluate the performance of individual components
2	PCC-ME	Student is able to learn the principles of combustion, stoichiometry and flue gas analysis
3	PCC-ME	Students will be able to design the components and calculate the losses and efficiency of the boilers, nozzles and impulse turbines.
4	PCC-ME	Students will be able to design the components and calculate the losses and efficiency of reactions turbines and condensers.
5	PCC-ME	Student is able to learn various types of compressors, principles of working and their performance evaluation

FLUID MECHANICS & HYDRAULIC MACHINES

At the end of the course student should be able

S.No	Course code	CO Statement
1	PCC-ME	The basic concepts of fluid properties
2	PCC-ME	The mechanics of fluids in static and dynamic conditions
3	PCC-ME	Boundary layer theory, flow separation and dimensional analysis.
4	PCC-ME	Hydrodynamic forces of jet on vanes in different positions
5	PCC-ME	Working Principles and performance evaluation of hydraulic pump and turbines.

METAL CUTTING & MACHINE TOOLS

At the end of the course student should be able

S.No	Course code	CO Statement
1	PCC-ME	Learned the fundamental knowledge and principals in material removal process
2	PCC-ME	acquire the knowledge on operations in conventional, automatic, Capstan and turret lathes
3	PCC-ME	capable of understanding the working principles and operations of shaping, slotting, planing, drilling and boring machines
4	PCC-ME	able to make gear and keyway in milling machines and understand the indexing mechanisms
5	PCC-ME	Understand the different types of unconventional machining methods and principles of finishing processes.

DESIGN OF MACHINE MEMBERS – I

At the end of the course student should be able

S.No	Course code	CO Statement
1	PCC-ME	Calculate different stresses in the machine components subjected to various static loads, failures and suitability of a material for an engineering application.
2	PCC-ME	Calculate dynamic stresses in the machine components subjected to variable loads
3	PCC-ME	Design riveted, welded, bolted joints, keys, cotters and knuckle joints

4	PCC-ME	subjected to static loads and their failure modes Design the machine shafts and suggest suitable coupling for a given application.
5	PCC-ME	Calculate stresses in different types of springs subjected to static loads and dynamic loads

FLUID MECHANICS & HYDRAULIC MACHINERY LAB

At the end of the course student should be able

Sno	Course code	CO Statement
1	PCC-Lab5	Explain the effect of fluid properties on a flow system. Identify type of fluid flow patterns and describe continuity equation.
2	PCC-Lab5	Analyze a variety of practical fluid flow, measuring devices and utilize fluid mechanics principles in design. CO4 Select and analyze an appropriate turbine with reference to given situation in power plants.
3	PCC-Lab5	Estimate performance parameters of a given centrifugal and reciprocating pump. Able to demonstrate boundary layer concepts.

MACHINE TOOLS LAB

At the end of the course student should be able

Sno	Course code	CO Statement
1	PCC-Lab6	The students can operate different machine tools with understanding of work holders and operating principles to produce different part features to the desired quality.
2		
3		

III YEAR I SEMESTER :

DYNAMICS OF MACHINERY

At the end of the course student should be able

S.No	Course code	CO Statement
1	PCC-ME	To compute the frictional losses and transmission in clutches, brakes and dynamometers.
2	PCC-ME	To determine the effect of gyroscopic couple in motor vehicles, ships and aeroplanes
3	PCC-ME	To analyze the forces in four bar and slider crank mechanisms and design a flywheel
4	PCC-ME	To determine the rotary unbalanced mass in reciprocating equipment
5	PCC-ME	To determine the unbalanced forces and couples in reciprocating and radial engines

DESIGN OF MACHINE MEMBERS-II

At the end of the course student should be able

S.No	Course code	CO Statement
1	PCC-ME	Select the suitable bearing based on the application of the loads and predict the life of the bearing.
2	PCC-ME	Design of IC Engines parts
3	PCC-ME	Design of power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws
4	PCC-ME	Design spur & helical gear for different engineering applications

MECHANICAL MEASUREMENTS & METROLOGY

S.No	Course code	CO Statement
1	PCC-ME	Describe the construction and working principles of measuring instruments for measurement of displacement and speed and select appropriate instrument for a given application
2	PCC-ME	Describe the construction and working principles of measuring instruments for strain, force, Torque, power, acceleration and Vibration and select appropriate instrument for a given application
3	PCC-ME	Explain shaft basis system and hole basis systems for fits and represent tolerances for a given fit as per the shaft basis system and hole basis system and design limit gauges based on the tolerances for quality check in mass

THEORY OF MACHINES LAB

Sno	Course code	CO Statement
1	PCC-Lab	1. Identify various links in popular mechanisms. 2. Select suitable mechanism for various applications
2	PCC-Lab	3. Analyze the motion of cams and followers. 4. Select relevant belts, chains and drives for different applications.
3	PCC-Lab	5. Select relevant brakes and clutches for various applications 6. Select suitable flywheel and governor for various applications.

MECHANICAL MEASUREMENTS & METROLOGY LAB

Sno	Course code	CO Statement
1	PCC-Lab	Metrology Lab Student will become familiar with the different instruments that are available for linear, angular, roundness and roughness measurements they will be able to select and use the appropriate measuring instrument according to a specific requirement (in terms of accuracy, etc)

SOCIALLY RELEVANT PROJECT

Sno	Course code	CO Statement
1		
2		
3		

MACHINE DRAWING

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PCC-ME	Draw and represent standard dimensions of different mechanical fasteners and joints and Couplings.
2	PCC-ME	. Draw different types of bearings showing different components.
3	PCC-ME	Assemble components of a machine part and draw the sectional assembly drawing showing the dimensions of all the components of the assembly as per bill of materials
4	PCC-ME	Select and represent fits and geometrical form of different mating parts in assembly drawings
5	PCC-ME	To prepare manufacturing drawings indicating fits, tolerances, surface finish and surface treatment requirements.

METALLURGY & MECHANICS OF SOLIDS LAB

At the end of the course student should be able to

Sno	Course code	CO Statement
1	PCC-Lab1	Summarize the crystal structure for SC, BCC, FCC and HCP. Outline the microstructure for pure metals and alloys. Observe the micro structure of heat treated steels. Observe the hardness of alloys metals by using jominey quenching test. Describe how and why defects (point, line and interfacial) in materials greatly affect engineering properties and limit their use in service.
2	PCC-Lab1	Analyze the behaviour of the solid bodies subjected to various types of loading. Apply knowledge of materials and structural elements to the analysis of simple structures. Undertake problem identification, formulation and solution using a range of analytical methods. Analyze and interpret laboratory data relating to behaviour of structures and the materials they are made of, and undertake associated laboratory work individually and in teams Expectation and capacity to undertake lifelong learning.
3		

AVANTHI INSTITUTE OF ENGINEERING AND TECHNOLOG

Tamaram(V), Makavarapalem(M), Visakhapatnam-531113

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

1 year 1 semester

FUNDAMENTALS OF COMPUTER SCIENCE

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1112	Illustrate the concept of input and output devices of Computers and how it works and recognize the basic terminology used in computer programming.
2	ES1112	Recognize the Computer networks, types of networks and topologies.
3	ES1112	Summarize the concepts of Operating Systems and Databases.
4	ES1112	Recite the Advanced Computer Technologies like Distributed Computing & Wireless Networks

IT WORKSHOP

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1105	Assemble and disassemble components of a PC
2	ES1105	Construct a fully functional virtual machine, Summarize various Linux operating system commands,
3	ES1105	Secure a computer from cyber threats, Learn and practice programming skill in Github, Hackerrank, Codechef, HackerEarth etc.

PROGRAMMING FOR PROBLEM SOLVING USING C

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1201	To write algorithms and to draw flowcharts for solving problems
2	ES1201	To convert flowcharts/algorithms to C Programs, compile and debug programs
3	ES1201	To use different operators, data types and write programs that use two-way/multi-way selection
4	ES1201	To select the best loop construct for a given problem
5	ES1201	To design and implement programs to analyze the different pointer applications
6	ES1201	To apply File I/O operations

PROGRAMMING FOR PROBLEM SOLVING USING C lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1202	Gains Knowledge on various concepts of a C language.
2	ES1202	Able to draw flowcharts and write algorithms.
3	ES1202	Able design and development of C problem solving skills.

Digital logic design

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES1213	An ability to define different number systems, binary addition and subtraction, 2's complement representation and operations with this representation
2	ES1213	An ability to understand the different switching algebra theorems and apply them for logic functions
3	ES1213	An ability to define the Karnaugh map for a few variables and perform an algorithmic reduction of logic functions
4	ES1213	Students will be able to design various logic gates starting from simple ordinary gates to complex programmable logic devices & arrays.
5	ES1213	Students will be able to design various sequential circuits starting from flip-flop to registers and counters.

II year I semester

MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

At the end of the course student should be able to

Sno	Course code	CO Statement
1	CS2101	Demonstrate skills in solving mathematical problems
2	CS2101	Comprehend mathematical principles and logic
3	CS2101	Demonstrate knowledge of mathematical modeling and proficiency in using mathematical software
4	CS2101	Manipulate and analyze data numerically and/or graphically using appropriate Software
5	CS2101	Communicate effectively mathematical ideas/results verbally or in writing

SOFTWARE ENGINEERING

At the end of the course student should be able to

Sno	Course code	CO Statement
1	CS2102	Ability to transform an Object-Oriented Design into high quality, executable code
2	CS2102	Skills to design, implement, and execute test cases at the Unit and Integration level
3	CS2102	Compare conventional and agile software methods

Python Programming

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES2101	Develop essential programming skills in computer programming concepts like data types, containers
2	ES2101	Apply the basics of programming in the Python language
3	ES2101	Solve coding tasks related conditional execution, loops
4	ES2101	Solve coding tasks related to the fundamental notions and techniques used in objectoriented programming

Data structures through c++

At the end of the course student should be able to

Sno	Course code	CO Statement
1	CS2103	Summarize the properties, interfaces, and behaviors of basic abstract data types
2	CS2103	Discuss the computational efficiency of the principal algorithms for sorting & searching
3	CS2103	Use arrays, records, linked structures, stacks, queues, trees, and Graphs in writing programs
4	CS2103	Demonstrate different methods for traversing trees

Object Oriented Programming through C++

At the end of the course student should be able to

Sno	Course code	CO Statement
1	CS2104	Classify object oriented programming and procedural programming
2	CS2104	Apply C++ features such as composition of objects, operator overloads, dynamic memory allocation, inheritance and polymorphism, file I/O, exception handling
3	CS2104	Build C++ classes using appropriate encapsulation and design principles
4	CS2104	Apply object oriented or non-object oriented techniques to solve bigger computing problems

Computer Organization

At the end of the course student should be able to

Sno	Course code	CO Statement
1	CS2105	Develop a detailed understanding of computer systems
2	CS2105	Cite different number systems, binary addition and subtraction, standard, floating-point, and micro operations
3	CS2105	Exemplify in a better way the I/O and memory organization
4	CS2105	Illustrate concepts of parallel processing, pipelining and inter processor communication

Data structures through c++ Lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	CS2106	Apply the various OOPs concepts with the help of programs.
2	CS2106	Use basic data structures such as arrays and linked list.
3	CS2106	Use various searching and sorting algorithms.

Python programming lab

At the end of the course student should be able to

Sno	Course code	CO Statement
1	ES2102	Write, Test and Debug Python Programs
2	ES2102	Use Conditionals and Loops for Python Programs
3	ES2102	Use functions and represent Compound data using Lists, Tuples and Dictionaries

II Year II semester
Probability and Statistics

At the end of the course student should be able to

Sno	Course code	CO Statement
1	BS2201	Classify the concepts of data science and its importance (L4) or (L2)
2	BS2201	Interpret the association of characteristics and through correlation and regression tools (L4)
3	BS2201	Make use of the concepts of probability and their applications (L3)
4	BS2201	Apply discrete and continuous probability distributions (L3)
5	BS2201	Design the components of a classical hypothesis test (L6)
6	BS2201	Infer the statistical inferential methods based on small and large sampling tests (L4)

JAVA Programming

At the end of the course student should be able to

Sno	Course code	CO Statement
1	CS2201	Able to realize the concept of Object Oriented Programming & Java Programming Constructs
2	CS2201	Able to describe the basic concepts of Java such as operators, classes, objects, inheritance, packages, Enumeration and various keywords
3	CS2201	Apply the concept of exception handling and Input/ Output operations
4	CS2201	Able to design the applications of Java & Java applet
5	CS2201	Able to Analyze & Design the concept of Event Handling and Abstract Window Toolkit

Operating Systems

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS2202	Describe various generations of Operating System and functions of Operating System
2	CS2202	Describe the concept of program, process and thread and analyze various CPU Scheduling Algorithms and compare their performance
3	CS2202	Solve Inter Process Communication problems using Mathematical Equations by various methods
4	CS2202	Compare various Memory Management Schemes especially paging and Segmentation in Operating System and apply various Page Replacement Techniques
5	CS2202	Outline File Systems in Operating System like UNIX/Linux and Windows

Database Management Systems

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS2203	Describe a relational database and object-oriented database
2	CS2203	Create, maintain and manipulate a relational database using SQL
3	CS2203	Describe ER model and normalization for database design
4	CS2203	Examine issues in data storage and query processing and can formulate appropriate solutions
5	CS2203	Outline the role and issues in management of data such as efficiency, privacy, security, ethical responsibility, and strategic advantage

Formal Language Automata Theory (FLAT)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS2204	Classify machines by their power to recognize languages
2	CS2204	Summarize language classes & grammars relationship among them with the help of Chomsky hierarchy
3	CS2204	Employ finite state machines to solve problems in computing
4	CS2204	Illustrate deterministic and non-deterministic machines
5	CS2204	Quote the hierarchy of problems arising in the computer science

Database Management Systems Lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS2207	Utilize SQL to execute queries for creating database and performing data manipulation operations
2	CS2207	Examine integrity constraints to build efficient databases
3	CS2207	Apply Queries using Advanced Concepts of SQL

UNIX Operating System Lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS2206	To use Unix utilities and perform basic shell control of the utilities
2	CS2206	Students will be able to use Linux environment efficiently
3	CS2206	To use of an operating system to develop software

Java Programming Lab:

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS2205	Evaluate default value of all primitive data type, Operations, Expressions, Control-flow, Strings
2	CS2205	Determine Class, Objects, Methods, Inheritance, Exception, Runtime Polymorphism, User defined Exception handling mechanism
3	CS2205	Construct Threads, Event Handling, implement packages, developing applets

III year I semester

Data Warehousing and Data Mining

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS3101	Design a Data warehouse system and perform business analysis with OLAP tools
2	CS3101	Design a Data warehouse system and perform business analysis with OLAP tools
3	CS3101	Apply frequent pattern and association rule mining techniques for data analysis
4	CS3101	Apply appropriate classification techniques for data analysis
5	CS3101	Apply appropriate clustering techniques for data analysis

S.No	Course code	CO Statement
1	CS3103	Design, develop, and implement a compiler for any language
2	CS3103	Use LEX and YACC tools for developing a scanner and a parser
3	CS3103	Design and implement LL and LR parsers
4	CS3103	Design algorithms to perform code optimization in order to improve the performance of a program in terms of space and time complexity
5	CS3103	Apply algorithms to generate machine code

Computer Networks

S.No	Course code	CO Statement
1	CS3102	Illustrate the OSI and TCP/IP reference model
2	CS3102	Analyze MAC layer protocols and LAN technologies
3	CS3102	Design applications using internet protocols
4	CS3102	Implement routing and congestion control algorithms
5	CS3102	Develop application layer protocols

Artificial Intelligence

At the end of the course student should be able

S.No	Course code	CO Statement
1	CS3104	Outline problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem
2	CS3104	Apply the language/framework of different AI methods for a given problem
3	CS3104	Implement basic AI algorithms- standard search algorithms or dynamic programming
4	CS3104	Design and carry out an empirical evaluation of different algorithms on problem formalization, and state the conclusions that the evaluation supports

Software Testing Methodologies

At the end of the course student should be able

S.No	Course code	CO Statement
1	PE3101	Identify and understand various software testing problems, apply software testing knowledge and engineering methods and solve these problems by designing and selecting software test models, criteria, strategies, and methods
2	PE3101	Design and conduct a software test process for a software project
3	PE3101	Analyze the needs of software test automation
4	PE3101	Use various communication methods and skills to communicate with their teammates to conduct their practice-oriented software testing projects
5	PE3101	Basic understanding and knowledge of contemporary issues in software testing, such as component-based, web based and object oriented software testing problems

Computer Networks Lab

At the end of the course student should be able

S.No	Course code	CO Statement
1	CS3105	Apply the basics of Physical layer in real time applications
2	CS3105	Apply data link layer concepts, design issues, and protocols
3	CS3105	Apply Network layer routing protocols and IP addressing
4	CS3105	Implement the functions of Application layer and Presentation layer paradigms and Protocols

AI Tools & Techniques Lab

At the end of the course student should be able

S.No	Course code	CO Statement
1	CS3106	Identify problems that are amenable to solution by AI methods
2	CS3106	Identify appropriate AI methods to solve a given problem
3	CS3106	Use language/framework of different AI methods for solving problems

Data Mining Lab

At the end of the course student should be able

S.No	Course code	CO Statement
1	CS3107	Extend the functionality of R by using add-on packages
2	CS3107	Code statistical functions in R
3	CS3107	Apply the knowledge of R gained to data Analytics for real life applications

III year II semester

Web Technologies

At the end of the course student should be able

S.No	Course code	CO Statement
1	CS3201	Illustrate the basic concepts of HTML and CSS & apply those concepts to design static web pages
2	CS3201	Identify and understand various concepts related to dynamic web pages and validate them using JavaScript
3	CS3201	Outline the concepts of Extensible markup language & AJAX
4	CS3201	Develop web Applications using Scripting Languages & Frameworks
5	CS3201	Create and deploy secure, usable database driven web applications using PHP and RUBY

DISTRIBUTED SYSTEMS

At the end of the course student should be able

S.No	Course code	CO Statement
1	CS3202	Elucidate the foundations and issues of distributed systems
2	CS3202	Illustrate the various synchronization issues and global state for distributed systems
3	CS3202	Illustrate the Mutual Exclusion and Deadlock detection algorithms in distributed systems
4	CS3202	Describe the agreement protocols and fault tolerance mechanisms in distributed systems
5	CS3202	Describe the features of peer-to-peer and distributed shared memory systems

Design Analysis of Algorithms

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS3203	Describe asymptotic notation used for denoting performance of algorithms
2	CS3203	Analyze the performance of a given algorithm and denote its time complexity using the asymptotic notation for recursive and non-recursive algorithms
3	CS3203	List and describe various algorithmic approaches
4	CS3203	Solve problems using divide and conquer, greedy, dynamic programming, backtracking and branch and bound algorithmic approaches
5	CS3203	Apply graph search algorithms to real world problems
6	CS3203	Demonstrate an understanding of NP- Completeness theory and lower bound theory

Managerial Economics and Financial Accountancy

At the end of the course student should be able to

S.No	Course code	CO Statement
1	HS3201	The Learning objectives of this paper are to understand the concept and nature of Managerial Economics and its relationship with other disciplines and also to understand the Concept of Demand and Demand forecasting.
2	HS3201	To familiarize about the Production function, Input Output relationship, Cost-Output relationship and Cost-Volume-Profit Analysis.
3	HS3201	To understand the nature of markets, Methods of Pricing in the different market structures and to know the different forms of Business organization and the concept of Business Cycles.
4	HS3201	To learn different Accounting Systems, preparation of Financial Statement and uses of different tools for performance evaluation
5	HS3201	Finally, it is also to understand the concept of Capital, Capital Budgeting and the techniques used to evaluate Capital Budgeting proposals.

Web Technologies Lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS3204	Analyze and apply the role of languages like HTML, CSS, XML
2	CS3204	Review JavaScript, PHP and protocols in the workings of the web and web applications
3	CS3204	Apply Web Application Terminologies, Internet Tools, E – Commerce and other web services
4	CS3204	Develop and Analyze dynamic Web Applications using PHP & MySql
5	CS3204	Install & Use Frameworks

IV year I semester

Cryptography and Network security

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS4101.1	Identify information security goals, classical encryption techniques and acquire fundamental knowledge on the concepts of finite fields and number theory
2	CS4101.2	Compare and apply different encryption and decryption techniques to solve problems related to confidentiality and authentication
3	CS4101.3	Apply the knowledge of cryptographic checksums and evaluate the performance of different message digest algorithms for verifying the integrity of varying message sizes
4	CS4101.4	Apply different digital signature algorithms to achieve authentication and create secure applications
5	CS4101.5	Apply network security basics, analyze different attacks on networks and evaluate the performance of firewalls and security protocols like SSL, IPSec, and PGP
6	CS4101.6	performance of firewalls and security protocols like SSL, IPSec, and PGP Apply the knowledge of cryptographic utilities and authentication mechanisms to design secure applications

UML & Design Patterns

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS4102.1	Illustrate software design with UML diagrams
2	CS4102.2	Design software applications using OO concepts
3	CS4102.3	Identify various scenarios based on software requirements
4	CS4102.4	Apply UML based software design into pattern based design using design patterns
5	CS4102.5	Illustrate the various testing methodologies for OO software

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS4103.1	Identify machine learning techniques suitable for a given problem
2	CS4103.2	Solve the problems using various machine learning techniques
3	CS4103.3	Apply Dimensionality reduction techniques
4	CS4103.4	Design application using machine learning techniques
5	CS4103.5	

Open Elective -II (Inter Disciplinary)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	OE4101.1	
2	OE4101.2	
3	OE4101.3	
4	OE4101.4	
5	OE4101.5	
6	OE4101.6	

Professional Elective- III (Elective)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PE4101.1	
2	PE4101.2	
3	PE4101.3	
4	PE4101.4	
5	PE4101.5	
6	PE4101.6	

Professional Elective- IV

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PE4102.1	
2	PE4102.2	
3	PE4102.3	
4	PE4102.4	

UML lab

At the end of the course student should be able to

S.No	Course code	CO Statement
1	CS4104.1	Know the syntax of different UML diagrams
2	CS4104.2	Create use case documents that capture requirements for a software system
3	CS4104.3	Develop simple applications

IPR & Patents

At the end of the course student should be able to

S.No	Course code	CO Statement
1	MC4101.1	IPR Laws and patents pave the way for innovative ideas which are instrumental for inventions to seek Patents
2	MC4101.2	Student get an insight on Copyrights, Patents and Software patents which are instrumental for further advancements

At the end of the course student should be able to

S.No	Course code	CO Statement
1	HS4201.1	After completion of the Course the student will acquire the knowledge on management functions, global leadership and organizational structure
2	HS4201.2	Will familiarize with the concepts of functional management that is HRM and Marketing of new product developments
3	HS4201.3	The learner is able to think in strategically through contemporary management practices
4	HS4201.4	The learner can develop positive attitude through personality development and can equip with motivational theories
5	HS4201.5	The student can attain the group performance and grievance handling in managing the organizational culture

Open Elective- III (Inter Disciplinary)

At the end of the course student should be able to

S.No	Course code	CO Statement
1	OE4201.1	
2	OE4201.2	
3	OE4201.3	
4	OE4201.4	
5	OE4201.5	

Professional Elective-V

At the end of the course student should be able to

S.No	Course code	CO Statement
1	PE4201.1	
2	PE4201.2	
3	PE4201.3	
4	PE4201.4	
5	PE4201.5	

Principal

HOD

III YEAR I SEMESTER :

DYNAMICS OF MACHINERY

At the end of the course student should be able

S.No	Course code	CO Statement
1	PCC-ME	To compute the frictional losses and transmission in clutches, brakes and dynamometers.
2	PCC-ME	To determine the effect of gyroscopic couple in motor vehicles, ships and aeroplanes
3	PCC-ME	To analyze the forces in four bar and slider crank mechanisms and design a flywheel
4	PCC-ME	To determine the rotary unbalanced mass in reciprocating equipment
5	PCC-ME	To determine the unbalanced forces and couples in reciprocating and radial engines

DESIGN OF MACHINE MEMBERS-II

At the end of the course student should be able

S.No	Course code	CO Statement
1	PCC-ME	Select the suitable bearing based on the application of the loads and predict the life of the bearing.
2	PCC-ME	Design of IC Engines parts
3	PCC-ME	Design of power transmission elements such as gears, belts, chains, pulleys, ropes, levers and power screws
4	PCC-ME	Design spur & helical gear for different engineering applications

MECHANICAL MEASUREMENTS & METROLOGY

S.No	Course code	CO Statement
1	PCC-ME	Describe the construction and working principles of measuring instruments for measurement of displacement and speed and select appropriate instrument for a given application
2	PCC-ME	Describe the construction and working principles of measuring instruments for strain, force, Torque, power, acceleration and Vibration and select appropriate instrument for a given application
3	PCC-ME	Explain shaft basis system and hole basis systems for fits and represent tolerances for a given fit as per the shaft basis system and hole basis system and design limit gauges based on the tolerances for quality check in mass production
4	PCC-ME	Explain methods for linear, angle and flatness measurements and select a

suitable method and its relevant instrument for a given application

MANAGERIAL ECONOMICS AND FINANCIAL ACCOUNTANCY

S.No	Course code	CO Statement
1	PCC-ME	The Learner is equipped with the knowledge of estimating the Demand and demand elasticities for a product. The knowledge of understanding of the Input-Output-Cost relationships and estimation of the least. The Learner can able to evaluate various investment project proposals with the help of capital, cost combination of inputs
2	PCC-ME	The pupil is also ready to understand the nature of different markets and Price Output determination under various market conditions and also to have the knowledge of different Business Units.
3	PCC-ME	The Learner is able to prepare Financial Statements and the usage of various Accounting tools for Analysis
4	PCC-ME	budgeting techniques for decision making

IC ENGINES & GAS TURBINES

: Student must able to,

S.No	Course code	CO Statement
1	PCC-ME	Derive the actual cycle from fuel-air cycle and air- standard cycle for all practical applications..
2	PCC-ME	Explain working principle and various components of IC engine
3	PCC-ME	Explain combustion phenomenon of CI and SI engines and their impact on engine variables
4	PCC-ME	Analyze the performance of an IC engine based on the performance parameters
5	PCC-ME	Explain the cycles and systems of a gas turbine and determine the efficiency of gas turbine

THERMAL ENGINEERING LAB

Sno	Course code	CO Statement
1	PCC-Lab	1 Illustrate the viscosity of liquid lubricants. 2 Understand the calorific values of solid and gaseous fuels
2	PCC-Lab	3 Analyse the flash and fire points of liquid fuels. 4 Observe the carbon residue for fuels.
3	PCC-Lab	5 Compare the depth penetration for different lubricants.

THEORY OF MACHINES LAB

Sno	Course code	CO Statement
1	PCC-Lab	1. Identify various links in popular mechanisms.
2	PCC-Lab	2. Select suitable mechanism for various applications. 3. Analyze the motion of cams and followers.
3	PCC-Lab	4. Select relevant belts, chains and drives for different applications. 5. Select relevant brakes and clutches for various applications 6. Select suitable flywheel and governor for various applications.

MECHANICAL MEASUREMENTS & METROLOGY LAB

Sno	Course code	CO Statement
1	PCC-Lab	Metrology Lab Student will become familiar with the different instruments that are available for linear, angular, roundness and roughness measurements they will be able to select and use the appropriate measuring instrument according to a specific requirement (in terms of accuracy, etc)

SOCIALLY RELEVANT PROJECT

Sno	Course code	CO Statement
1		
2		
3		