Prerequisite: Principles of management, Human resources management, Production management, Project management

Course Description: In this course, students will learn fundamental concepts and contributions of management. This course also teaches human resources practices which play a vital role in the organisation it gives knowledge about use of improve quality of work and project management.

Course Objectives:
1. To make students understand management, its principles, contribution to management, organization, and its basic issues and types
2. To make students understand the concept of plant location and its factors and plant layout and types, method of production and work study importance
3. To understand the purpose and function of statistical quality control and material management techniques
4. To make students understand the concept of HRM and its functions
5. To make students understand PERT & CPM methods in effective project management and need of project crashing and its consequence on cost of project

Course Outcomes: At the end of the course, the student will be able to
CO1: Apply management principles to the particle situations to be in a position to know which type of business organisation structure suits
CO1: Able to make decision making relating to the problems in operations and production activities thereby improving the productivity by proper utilisation input factors by designing the better working methods and with better work study techniques.
CO3: Able to improve quality of working through SQC techniques and to take effective decision making relating to reduce the investment in materials through better control of inventory
CO4: Able to manage people in working environment with the practices of HRM across corporate businesses
CO5: Able to use PERT & CPM techniques in effective project management to identify critical path and try to complete projects on time as well as reducing the project durations if need arises.

UNIT - I

UNIT - II
Operations Management: Plant location, Factors influencing location, Principles and types of plant layouts - Methods of production (job, batch and mass production), Work study - Basic procedure involved in method study and Work measurement
UNIT - III

**Statistical quality control** - Concept of Quality & Quality Control - functions, Meaning of SQC - Variables and attributes - X chart, R Chart, C Chart, P Chart, (simple Problems) Acceptance sampling, Sampling plans, Deming’s contribution to quality.

**Materials management** - Meaning and objectives, inventory control - Need for inventory control, Purchase procedure, Store records, EOQ, ABC analysis, Stock levels

UNIT - IV

**Human Resource management (HRM):** Concepts of HRM, Basic functions of HR manager: Man power planning, Recruitment, Selection, Training and development, Placement, Wage and salary administration, Promotion, Transfers Separation, performance appraisal, Job evaluation and merit rating.

UNIT - V

**Project management:** Early techniques in project management - Network analysis: Programme evaluation and review technique (PERT), Critical path method (CPM), Identifying critical path, Probability of completing project within given time, Project cost analysis, project crashing (simple problems)

TEXT BOOK:

REFERENCES:
2. Stoner, Freeman, Gilbert, Management, 6th edition Pearson education, New Delhi, 2004
4. O.P. Khana, Industrial engineering and Management L.S. Srinath, PERT & CPM
Pre-Requisite:

The objective of this course is to lay an important foundation to students in managing projects with a special focus on every phase such as project planning, execution, monitoring and evaluation.

Course objectives:
1. To lay an important foundation to students in managing projects.
2. To focus on organization culture and creating a culture for Project Management.
3. To understand the importance of Project planning and controlling process.
4. To create an awareness on reporting objectives and execution process.
5. Lay stress on building and leading a project team.

Course Outcomes: At the end of the course, the student will be able to
CO1: Understand the concept of project management.
CO2: Awareness on Organization strategy and structure and culture.
CO3: Knowledge on defining the project and its controlling process.
CO4: Ability in executing and evaluating the project.
CO5: Understand the importance of a team and achieving cross-functional co-operation.

UNIT-I

UNIT-II
Organization strategy and structure and culture, Formula of organization structure, stake holder management, organization culture, creating a culture for Project Management.

UNIT-III
Project Planning Project Planning Defining the project, Approaches to project screening and selection, Work breakdown structure, financial Module, Getting Approval and compiling a project charter, setting up a monitoring and controlling process.

UNIT-IV
Project Execution Initiating the Project, Controlling and Reporting project objectives, conducting project Evaluation, Managing Risk-Four Stage Process, risk management an integrated approach, cost Management, Creating a project Budget.

UNIT-V
Leading Project Teams Building a project Team, Characteristics of an Effective project Team, achieving cross- functional co-operation, virtual project teams, Conflicts management, Negotiations

TEXT BOOKS:
REFERENCES:
7. Guide to Project Management Body of Knowledge (PMBOK® Guide) of Project Management Institute, USA.
Pre-Requisite: Inventory management, production management, material management

Course Educational Objectives: The course aims to make the students to:
- Apply and gain in-depth knowledge on the integrated purchasing, logistics, materials and supply chain management
- Identify the integration between the various elements in the supply chain process
- Learn how to establish benchmark of the organization by taking best practices of the world class organisations.
- Design transportation networks and use of different modes of transportation.
- Apply the latest IT tools and techniques to evaluate supply chain systems

Course Outcomes: After completing of this course, the students should be able to:
CO1: Examine the design and performance of supply networks and processes in different business contexts.
CO2: Develop capabilities in logistics, coordination for supply chain integration, inventory management; risk pooling, procurement, product and process design, and international supply chain management.
CO3: Configure logistics networks and assess their performance impacts on efficiency and service levels.
CO4: Design supply chain contracts for effective governance of supply chain relationships.
CO5: Diagnose information integration problems across the supply chain and their consequent impacts in deploying physical and financial resources optimally.

UNIT - I
Introduction to Supply Chain Management: Concept, Objectives, Scope and Functions of Supply Chain; Process view of a Supply Chain; Impact of Supply Chain Flows.
Supply Chain Drivers: Facilities, Inventory, Transportation, Information, Sourcing, Pricing; Obstacles to Achieve Strategic fit; Role of Aggregate Planning in Supply Chain, Methods and Managing Supply and Demand.
Supply Chain Performance: Competitive Advantage and Supply Chain Strategies, Achieving Strategic fit.

UNIT - II
Logistics Management: Introduction, Difference between Logistics and Supply Chain; Inbound, Inter and Outbound Logistics; Integrated Logistics Management; 3PL, 4PL, Intermodal and Reverse Logistics.

UNIT - III
Supply Chain Relationship: Bench marking - Objectives, Bench marking Cycle, Process and types, Setting Bench marking Priorities.
Sourcing in Supply Chain: Role of Sourcing in Supply Chain Management, Supplier Scoring and Assessment; Supplier Selection and Controlling; The Procurement process, Sourcing Planning and Analysis; Global Sourcing.
Pricing and Revenue in Supply Chain: The role of Revenue Management in Supply Chain.
UNIT - IV
Network design in Supply Chain: The role of distribution in the Supply Chain Management, factors influencing distribution network design; Transportation Fundamentals: The role of Transportation in Supply Chain, Factors influencing Transportation Decisions, Modes of transportation, Transportation documentation.
Coordination in Supply Chain: Introduction, Lack of Supply Chain Coordination and the Bullwhip effect, Impact of Lack of Coordination, Obstacles to Coordination in Supply Chain, Managerial levers to achieve Coordination.

UNIT - V
IT in Supply Chain: The role of IT in the Supply Chain, The Supply Chain IT framework; CRM, Internal SCM, SRM; The future of IT in Supply Chain, Supply Chain IT in Practice.
Global Logistics and Global Supply Chain: Logistics in Global Economy, Change in Global Logistics, Global Supply Chain business process; Global Strategy; Global Purchasing, Global SCM.

TEXT BOOK

REFERENCES
Pre-requisite: Banking management and banking and finance

Course objectives
1. To make students understand the relationship between bankers and customers for mutual benefit
2. To create awareness to the students on various functions of banking system
3. To update the students on the emerging trends and issues in banking sector
4. To educate the students the significance of coverage of insurance
5. To make students understand the credit worthiness of customers based on their financials

Course Outcomes: After completing of this course, the students should be able to:
1. Able to understand importance of relationship between bankers and customers
2. Able to get exposure on various functions of banking systems
3. Able to connect to the emerging trends and issues in banking sector
4. Able to identify the importance of coverage of insurance
5. Able to evaluate the credit worthiness of different customers based on their key financial details

UNIT - I
Bankers- customer relationship: definition and meaning of banker and customer, permitted activities of commercial banks in India- deposit accounts- opening operations and closure of fixed deposit accounts- bank accounts and types

UNIT - II
Banking investments- negotiable instruments, types of negotiable instruments and parties, banking services Safe custody, MICR hearing, ATM’s, credit cards debit cards travelling cheques, ombudsmen and customer services.

UNIT - III
Emerging trends and issues- International banking euro bank and off-shore banking, overview of banking risks, Corporate governance, credit risk management in banks, liquidity risk management and asset liability management.

UNIT - IV
Principles and practices of insurance: introduction to risk and insurance, types of insurance- basic principles of general and life insurance- regulations on investments, insurance funds with respect to shareholders funds and policy shareholders funds.

UNIT - V
Types of insurance products: General insurance products - fire, marine, motor engineering and others.
Life insurance products: endowments, whole life plans, money back, ULIPs, pension plans, health plans, group insurance schemes. Risk management: risk & uncertainty

TEXT BOOKS
Banking and Insurance: by Shakti R. Mohapatra (Author), Debidutta Acharya (Author)
Vaughan, E.J. and T. Vaughan, Fundamentals of Risk and Insurance, Wiley & Sons
REFERENCES:

HEAD
Dept. of Business Administration
Lakireddy Bali Reddy College of Engg.
Mylavaram-521230., Krishna Dr
Pre-requisites: Nil

Course Educational Objectives: To learn the components of airplane and different types of flight vehicles, the basic aspects of aerodynamics and airfoils, the elements of propulsive systems, function of structural components in wing and fundamental aspects of aircraft performance and stability.

Course Outcomes: At the end of the semester, the student will be able
CO1: To describe functions of various external and internal components of an airplane
CO2: To understand the basic aspects of aerodynamics, aircraft propulsion systems and aircraft structural components
CO3: To analyze the basic performance of an aircraft.
CO4: To analyze the elementary modes of stability and control aspects

UNIT- I
BASIC ASPECTS OF FLIGHTS: History of Aviation, Atmosphere and Its Properties, Classification of Aircrafts, Components of Aircraft and Their Functions, Aircraft Motions; Control Surfaces

UNIT- II

UNIT- III

UNIT- IV
AIRCRAFT PERFORMANCE: Equations of Motion of an Airplane in Flight, Drag Polar, Thrust Required and Available, Power Required and Power Available, Rate of Climb, Time to Climb, Range, Endurance, Gliding Flight, Absolute and Service Ceilings, Take-Off and Landing Performance

UNIT- V

REFERENCES
Prerequisites: Nil

Course Objectives: This course deals with the importance of building planning, properties and applications of various building materials, soil classification and different types of foundations, important aspects of surveying, levelling operations and identify the terminology in roadway and railway networks, principles of water resources and environmental engineering.

COURSE OUTCOMES: At the end of the course, the student will be able to
CO1: Recognize the importance of building planning for construction
CO2: Identify appropriate building materials for construction purposes
CO3: Distinguish the different types of soils and foundations required for specific usage
CO4: Evaluate the basics of surveying and levelling operations for field application and categorize the important elements of roadway and railway networks
CO5: Discriminate the importance of quantity and quality aspects of water in the society and priorities for sanitation management.

UNIT I: BUILDING PLANNING
Role of a Civil Engineer: Interconnection among specialisations in Civil Engineering
Elements of a Building: Elements of a Building, Basic Requirements of a Building, Planning-
Hot and dry climates, Hot and wet climates, Cold climatic conditions, Aspect and Prospect, Roominess, Grouping, Privacy, circulation, Sanitation and ventilation, Orientation, Economy, Role of Bye-laws

UNIT II: BUILDING MATERIALS
Classification, Composition, Properties, Commercial forms, Uses of – Rocks, Bricks, Timber, Ply wood, Glass, Bitumen, Aluminium, Cement, Steel, Concrete, Mortar.
Concept of eco-friendly materials, examples.

UNIT III: SOIL CLASSIFICATION AND FOUNDATION
Types of soils, soil classification, engineering properties, Bearing capacity of soil, purpose and methods of improving bearing capacity – Foundations – Requirements, Loads, Types – Foundation for special structures-water tanks, silos, chimneys, cooling towers, telecommunication towers, transmission line towers.

UNIT IV: SURVEYING, LEVELLING & HIGHWAY NETWORK
Objective of surveying- Principles, applications and uses of - chain surveying, theodolite, levelling, contour maps, Planimeter, EDM concept- linear distance and area measurement, Total station- GIS-Concept and applications in civil engineering.
Indian highways- Basic terminology- Classification of roads - PJEV theory - Traffic signs - IRC Code provisions
Indian railways –Permanent way and components of railway track- Gauges – Rails -Sleepers – Ballast.
UNIT V: WATER RESOURCES AND ENVIRONMENTAL ENGINEERING

TEXT BOOKS

REFERENCES

Head
Dept of Civil Engineering
Lakireddy Bali Reddy College of Engg.
Mylavaram - 521 230, Krishna Dt. A.P.
Pre-requisites: C, C++.

Course Educational Objective: Concentrates on the methodological and technical aspects of software design and Programming based on OOP. Acquire the basic knowledge and skills necessary to implement object-oriented Programming techniques in software development through JAVA. Know about the importance of GUI based applications and the development of those Applications through JAVA. Get sufficient knowledge to enter the job market related to Web development.

Course Outcomes: At the end of the course, the student will be able to:
CO1: Identify Object Oriented concepts through constructs of JAVA.
CO2: Analyze the role of Inheritance, Polymorphism and implement Packages, Interfaces in Program design using JAVA.
CO3: Explore Exception handling and Multi-threading concepts in program design using JAVA.
CO4: Develop GUI based applications using Applet class and explore the concept of Event Handling using JAVA.
CO5: Design some examples of GUI based applications using AWT controls and Swings.

UNIT – I
Introduction: Drawbacks of POP, Object Oriented paradigm, OOP concepts.
Java Language: History of Java, Java Buzzwords, The Byte code, Simple types, Arrays, Type conversion and casting, simple java programs.
Introducing classes: Class fundamentals, declaring objects, access control and recursion, Constructors, garbage collection, Simple example programs of String and StringBuffer classes, Wrapper classes.

UNIT – II
Inheritance & Polymorphism: Inheritance basics, using super keyword, multilevel hierarchy, Method overloading, Method overriding, Dynamic method dispatch, abstract class, Object class and final keyword.
Packages: Defining a package, Accessing a Package, Understanding CLASSPATH, importing packages, exploring java.util package (StringTokenizer, date classes).
Interfaces: Defining an interface, implementing interface, applying interfaces, variables in interface and extending interfaces. Differences between classes and interfaces.

UNIT – III
Exception handling: Exception handling fundamentals, exception types, usage of try& catch, throw, throws and finally, Java Built-in Exceptions.
Multithreading: Differences between multi-threading and multitasking, java thread model, Creating thread, multiple threads and synchronizing threads.

UNIT – IV
Applet Class: Concepts of Applets, differences between applets and applications, applet architecture, skeleton, creating applets, passing parameters to applets, working with Graphicsclass.
Event Handling: Events handling mechanisms, Events, Event sources, Event classes, Event Listeners interfaces, Delegation event model, handling mouse and keyboard events, Adapterclasses, Inner classes.
UNIT – V
AWT controls: label, button, scrollbars, text components, check box, check box groups, Choices controls, lists, scrollbar, text field, layout managers – border, grid, flow.

TEXT BOOKS

REFERENCES
Prerequisite: Knowledge of Computers fundamentals, Data structures & CO.

Course Educational Objective (CEO):
The main objective of the course is to provide basic knowledge of computer operating system structure and functioning. Students able to understand how Operating Systems evolved with advent of computer architecture. Comprehend the different CPU scheduling algorithms, page replacement algorithms and identify best one.

Course Outcomes (COs): After the completion of this course, student will be able to:
CO1: Identify the functional aspects and implementation methods (system call And System programs of different modules in a general purpose operating System).
CO2: Evaluate scheduling and communication methods of processes handled by Operating systems through examples.
CO3: Analyse the process synchronization methods and deadlock handling Approaches employed in operating systems.
CO4: Evaluate memory management strategies such as paging and segmentation, Virtual Memory, swapping, and page replacement algorithms.
CO5: Analyse the implementation strategies of file systems regarding directory, Allocation, free space management and file recovery.

UNIT – I:
Operating-System Structures: Operating-System Services, User Operating-System Interface, System Calls, Types of System Calls, System Programs, Operating-System Design and Implementation, Operating-System Structure, Virtual Machines, Operating-System Generation, System Boot.

UNIT – II:
Process Scheduling: Scheduling Criteria, Scheduling Algorithms, Multiple-Processor Scheduling.

UNIT – III:
Synchronization-The Critical-Section Problem, Peterson’s Solution, Synchronization Hardware, Semaphores, Classic Problems of Synchronization, Monitors, Synchronization Examples, and Atomic Transactions.

UNIT – IV:
Memory Management Strategies: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation.
Virtual Memory Management: Demand Paging, Page Replacement, Allocation of Frames, Thrashing, Memory-Mapped Files, Allocating Kernel Memory.
UNIT-V:

TEXT BOOK:

REFERENCES:
Pre-Requisites: Basics related to Dynamics, Kinematics, Thermodynamics and Properties of an Ellipse.

Course Educational Objective: This course provides the knowledge on different laws associated with the motion of a satellite. The course gives the knowledge on launching a satellite into orbit with launch vehicles. The course also provides the knowledge on various subsystems, structures, thermal control and applications of a satellite.

Course Outcomes (COs): At the end of the course, student will be able to
CO1: Identify various applications of satellites, launch vehicles and basic functions of satellite system
CO2: Understand components, characteristics of a power subsystem and various aspects of spacecraft control
CO3: Evaluate the orbital model, parameters related to satellites and the requirements needed for the selection of an earth station
CO4: Analyze the satellite structures, internal and external design issues of a spacecraft

UNIT - I
Introduction to Satellite Systems: Need of space communication, common satellite applications and missions, General structure of satellite communication system. Types of spacecraft orbits, Launch vehicles, Satellite system and their functions (structure, thermal, mechanisms, power, propulsion, guidance and control, bus electronics)

UNIT - II

UNIT - III
Power System and Bus Electronics: Solar panels: Silicon and Ga-As cells, power generation capacity, efficiency-Space battery systems-battery types, characteristics and efficiency parameters-Power electronics. Telemetry, Tracking, command and monitoring (TTC&M) control functions. Generally employed communication bands (UHF/VHF, S, L, Ku, Ka etc), their characteristics and applications-Coding systems –Onboard computer –Ground checkout systems.

UNIT – IV
Spacecraft Control: Control requirements: attitude control and station keeping functions type of control maneuvers-Stabilization schemes: spin stabilization, gravity gradient methods, 3 axis stabilization-Commonly used control systems: mass expulsion systems, Momentum exchange Systems. Gyro and magnetic torque-sensors, star and sun sensor, earth sensor, magnetometers and inertial sensors.
UNIT - V
Satellite Structures and Thermal Control: Satellite mechanical and structural configuration: satellite configuration choices, launch loads, separation induced loads, deployment requirements- Design and analysis of satellite structures—Structural materials and fabrication-The need of thermal control: externally induced thermal environment—Internally induced thermal environment—Heat transfer mechanism: internal to the spacecraft and external heat load variations—Thermal control systems, active and passive methods.

TEXT BOOKS

REFERENCES
Pre-requisites: Vector, Scalar, Approximation of a vector by another vector, Differentiation and Integration of signals.

Course Educational Objective: This course provides the knowledge on fundamental characteristics of signals in time and frequency domain. The course will give an idea about various analog modulation techniques like amplitude, frequency, phase, pulse modulations. The course also gives the complete information regarding digital modulation.

Course Outcomes (COs): At the end of the course, students will be able to
CO1: Understand the fundamentals of signals and their properties.
CO2: Analyze the analog communication systems using amplitude and angle modulation.
CO3: Apply various modulation techniques for pulse transmission.
CO4: Evaluate the performance of fundamental blocks constituting various analog and digital modulation techniques.

UNIT-I:
Signal analysis: Concept of Signal, Classification of Signals; Representation of various Signals-Impulse, Unit Step, Unit Ramp, Signum, Decaying Exponential, Raising Exponential, Gate and Rectangular, Sinc and Sampling Signals; Operations on Signals- Time Shifting, Time Scaling, Time Reversal (Folding), Amplitude Scaling, Convolution; Graphical Method of Convolution; Introduction to Fourier series and Fourier transform.

UNIT-II:

UNIT-III:

UNIT-IV:
UNIT-V:
Digital modulation: (Qualitative treatment only) Advantages of digital communication over analog communication, Quantization, Pulse Code Modulation system, Delta Modulation, drawbacks of delta modulation, Adaptive delta modulation, Amplitude Shift Keying, Frequency Shift Keying, Binary Phase Shift Keying, Comparison of various digital modulations.

TEXT BOOKS

REFERENCES
B.Tech. (VII Sem.) 17EE80 - BASIC CONTROL SYSTEMS

Pre Requisite: None

Course Educational Objective: This course enables the students to
- Introduce the principles and applications of control systems in day to day life.
- Study the importance of modelling of different systems
- Test the Stability, Controllability and Observability of systems

Course Outcomes: At the end of the course, the students will be able to:
CO1. Develop mathematical of electromechanical systems.
CO2. Analyze for absolute stability, relative stability, Controllability and Observeability
CO3. Analyse linear control systems in time & frequency domain

UNIT-I: INTRODUCTION-MATHEMATICAL MODELLING OF CONTROL SYSTEM
Concepts of Control Systems- Classification of control systems, Open Loop and closed loop control systems - Different examples of control systems, Feed-Back Characteristics, Effects of feedback. Mathematical models – Differential equations, Impulse Response and transfer functions – Translational and Rotational mechanical systems,
Block diagram representation of systems -Block diagram algebra, Signal flow graph - Reduction using Mason’s gain formula.

UNIT - II: STATE SPACE ANALYSIS OF CONTINUOUS SYSTEMS
Concepts of state, state variables and state model, Canonical state space models, Solving the Time invariant state Equations- State Transition Matrix and it’s Properties – Concepts of Controllability and Observability.

UNIT - III: TIME RESPONSE ANALYSIS

UNIT - IV: FREQUENCY RESPONSE ANALYSIS
Introduction, Frequency domain specifications, Polar Plot, Bode diagrams, Nyquist Plot -Phase margin and Gain margin (Elementary treatment only).

UNIT - V: STABILITY ANALYSIS
The concept of stability – R-H stability criterion, The root locus concept - construction of root loci- Stability Analysis from Bode Plots and Nyquist plot( Elementary treatment only).

TEXT BOOKS

REFERENCES
Pre-requisites: None

Course Educational Objective: This course enables the student to
- familiarize with characteristics of various drives,
- comprehend the different issues related to heating, welding and illumination.

Course Outcomes: At the end of the course, the student will be able to:
CO1: Choose a drive for a particular application.
CO2: Identify a heating/welding scheme for a given application
CO3: Illustrate the different schemes of traction and its main components
CO4: Develop a lighting scheme for a given practical case
CO5: Assess the economic aspects in utilisation of electrical energy

UNIT – I: ELECTRIC HEATING AND WELDING
Introduction, classification of methods of electric heating, requirements of a good heating material, electric arc furnace, induction heating, dielectric heating.
Electric welding: Resistance welding, electric arc welding.

UNIT – II: ILLUMINATION ENGINEERING
Introduction, Nature of light, laws of illumination, lighting schemes, sources of light, fluorescent lamps, compact fluorescent lamps, LED lamps discharge lamps, mercury vapour lamps, sodium vapour lamps and neon lamps, comparison between tungsten filament lamps and fluorescent tubes, requirements of good lighting, street lighting.

UNIT – III: ELECTRIC DRIVES
Introduction, Factors affecting selection of motor, Types of loads, Steady state characteristics of drives, Transient characteristics, size of motor, Load equalization, industrial applications.

UNIT – IV: ELECTRIC TRACTION
Introduction, requirements of an ideal traction system, supply system for electric traction, train movement, mechanism of train movement, the traction motors, modern trends in electric traction, automation in electric traction.

UNIT – V: REFRIGERATION AND AIRCONDITIONING
Introduction, Types of refrigeration, compression refrigeration system, basic vapour compression cycle, absorption refrigeration system, operational features, household refrigerator, Airconditioning, Types of airconditioning system, room airconditioner, cooling capacity of an airconditioner, working of electrical system.

TEXT BOOKS:
REFERENCES:
COURSE EDUCATIONAL OBJECTIVES:
In this course student will learn about the basic concepts of measurement and instrumentation and measurement of strain, pressure, flow and temperature.

COURSE OUTCOMES: At the end of the course student will be able to
CO1: Illustrate the concepts of measurement, sources of error, different electrical Transduction principles and behaviour of first order and second order systems.
CO2: Summarize the theory of operation of strain measurement, types and materials for resistance strain gauges and gauging techniques.
CO3: Identify suitable methods for pressure measurement.
CO4: Categorize the flow measurement techniques.
CO5: Analyze the temperature measuring techniques.

UNIT – I
BASIC CONCEPTS OF MEASUREMENT AND INSTRUMENTATION SYSTEMS:
Introduction, System Configuration, Problem Analysis, Basic Characteristics of measuring devices, Calibration, Electrical Transducer, Classification, Basic requirements of a transducer, Generalised measurements, zero order systems, first order systems, second order systems, dead time element, Specifications and testing of dynamic response.

UNIT – II
MEASUREMENT OF STRAIN:
Introduction, Factors affecting strain measurements, Types of strain gauges, Theory of operation of resistance strain gauge, Types of Electrical Strain gauge, Materials for Strain gauges, Gauging Techniques and other factors, Strain gauge Circuits, Temperature Compensation, Applications.

UNIT – III
MEASUREMENT OF PRESSURE:
Introduction, Diaphragms, other elastic elements, Transduction methods, Force balance transducer, solid state devices, thin film pressure transducers, piezo electric pressure transducer, vibrating element pressure sensors.

UNIT – IV
MEASUREMENT OF FLOW:
Introduction, Classification of flow meters, head type of flow meters, rotameters, electromagnetic flow meter, mechanical flow meters, anemometers, ultra sonic flow meters, vortex flow meters, other flow meters, mass flow meters.

UNIT – V:
MEASUREMENT OF TEMPERATURE:
Introduction, Temperature scales, mechanical temperature sensors, resistance type temperature sensors, platinum resistance thermometers, thermistors, thermo couples, solid state sensors, Quartz thermometer, temperature measurement by radiation methods, optical pyrometer, Calibration of Thermometers.

Department of Electronics & Instrumentation Engg.
Lakireddy Bali Reddy College of Engg. (Autonomous)
Mylavaram - 521 230, Krishna Dt, A.P.

Head
TEXT BOOK

REFERENCES

[Signature]
Head
Department of Electronics & Instrumentation Engg.
Lakireddy Bali Reddy College of Engg. (Autonomous)
Mylavaram 521 230, Krishna Dt, A.P
Pre-requisite: Elementary set theory, concepts of relations and functions, propositional logic data structures (trees, Graphs, dictionaries) & File Concepts.

Course Educational Objective:
This course enables the students to know about DBMS basic concepts, Database Languages, Data base Design, Normalization process and Transaction processing AND Indexing.

Course Outcomes: At the end of the course, the student will be able to:
CO1: Understand DBMS concepts, architecture.
CO2: Design entity relationship model and make them to data model.
CO3: Understand the usage of keys and constraints for relational data.
CO4: Apply the normalization process for data base design.
CO5: Analyze the issues in transaction processing and different recovery strategies.

UNIT – I: Introduction:
An overview of database management system, database system Vs file system, Database system concepts and architecture, data models schema and instances, data independence and data base language and interfaces, Data definitions language, DML, Overall Database Structure.

UNIT –II: Data modelling using the Entity Relationship Model:
ER model concepts, notation for ER diagram, mapping constraints, keys, Concepts of Super Key, candidate key, primary key, Generalization, aggregation, reduction of an ER diagrams to tables, extended ER model, relationships of higher degree.

UNIT – III: Relational data Model and Language:
Relational data model concepts, integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints, relational algebra. Tables, views and indexes. Queries and sub queries. Aggregate functions. Insert, update and delete operations. Joins, Unions, Intersection, Minus, Cursors in SQL.

UNIT – IV: Normalization:
Functional dependencies, normal forms, first, second, third normal forms, BCNF, inclusion dependences, loss less join decompositions, normalization using FD, MVD, and JDs, alternative approaches to database design.

UNIT – V: Transaction Processing Concepts:
Transaction system, Testing of serializability, Serializability of schedules, conflict & view serializable schedule, recoverability, log based recovery, checkpoints, ARIESalgorithm,deadlock handling.

TEXT BOOK

REFERENCES
3. Date C.J. “An Introduction to Database System”, Addision Wesley.
B.Tech. (VII Sem.) 17ME80 - OPTIMIZATION TECHNIQUES

COURSE EDUCATIONAL OBJECTIVE: The main objective of this course is to understand the theory of optimization methods and algorithms developed to promote research interest in optimization models to apply for the numerical techniques and mathematical results of optimization theory for solving various types of optimization problems to Engineering problems.

COURSE OUTCOMES: At the end of the course, the student will be able to:
CO1: Understand the impact of optimization in Engineering.
CO2: Develop mathematical optimization models for a range of practical problems
CO3: Apply linear programming approach for optimizing the objectives of industrial oriented problems.
CO4: Apply the concepts of nonlinear programming techniques.
CO5: Resolve the complex problem into simple problems by dynamic programming approach.

UNIT-I
INTRODUCTION: Optimization – Historical Development – Engineering applications of optimization – Statement of an Optimization problem – Design vector, design space, design constrain and objective function

UNIT-II
CLASSICAL OPTIMIZATION TECHNIQUE: Single variable optimization, multivariable optimization with Equality and No constraints, Multi variable optimization with Inequality constraints. Convex programming problem.

UNIT - III

UNIT –IV

UNIT – V
DYNAMIC PROGRAMMING: Dynamic Programming – Formulation, Various applications using Dynamic Programming, Multistage Decision Processes, Concept of Sub optimization and Principle of Optimality

TEXT BOOKS

REFERENCES
B.Tech. (VII Sem.) 17ME81 - ELEMENTS OF AUTOMOBILE ENGINEERING

Course Education Objectives: The objective of this course is to make students learn about layout of an automobile, working of internal combustion engine, Cooling system, Transmission system, Steering system, Suspension system, Braking system, Fuel system and different Electrical systems.

Course Outcomes: After completion of the course students are able to
CO1: Understand the basic knowledge of internal combustion engines and their functioning.
CO2: Recognize the need of fuel supply systems and Cooling systems in Automobile.
CO3: Describe the functioning of different lubrication systems and various Electrical systems in Automobile.
CO4: Distinguish various transmission systems in automobiles.
CO5: Compare various types of Steering system, Braking system and Suspension system in Vehicles.

UNIT-I
INTRODUCTION: Components of Automobile, Classification of Automobiles, Chassis and Frame, Rear wheel drive- Front wheel drive-Four wheel drive.
ENGINE: Classification of Internal combustion engines, Basic Engine components, Basic terminology of Engines, Working principles of Four stroke and Two stroke engines, Engine construction Details- Cylinder Block and Crankcase- Cylinder Head- Oil Pan- Cylinder Liners- Piston- Connecting Rod- Crankshaft, Alternative Fuels, Application of IC Engines.

UNIT- II
COOLING SYSTEM: Methods of cooling- Air cooling and water cooling, Components of Water cooling system-Radiators-Thermostat- Fan-Coolant pump, Anti-freeze solutions.

UNIT - III
LUBRICATION SYSTEM: Objectives of Lubrication, Types of Lubrication systems- Dry sump and wet sump Lubrication, Oil filters and Oil pumps.
ELECTRICAL SYSTEMS: Types of Ignition systems, Battery Ignition system- Components of Battery Ignition system, Spark plug, Magneto Ignition system, Batteries- Types, Lead-acid battery, Charging system- Introduction- Principle of Generator and constructional details, Starting Motor, Starting drives- Bendix drives, Horn, Windscreen wiper, Central Locking facility.

UNIT - IV
WHEELS AND TYRES: Types of Wheels, Wheel dimensions, Tyre- Types of Tyres, Carcass types, Tyre Materials, Tyre designations.
UNIT - V
FRONT AXLE AND STEERING: Front Axle, Types of stub axle, Steering geometry- Camber- Kingpin inclination- Combined angle and scrub radius- Castor- Toe in and Toe out, Understeer and Oversteer, Power steering, Steering Linkages.
SUSPENSION SYSTEM: Introduction, Types of Suspension springs, Leaf springs, Coil springs, Torsion bars, Shock Absorbers, Independent suspension- Types, Air-suspension.
BRAKING SYSTEM: Braking Requirements, Types of Brakes, Drum brakes and Disc Brakes, Hydraulic Brakes, Air brakes, Anti-lock braking systems.

TEXT BOOKS

REFERENCES
Course Educational Objectives: To learn the space mission strategies and fundamental orbital mechanics, the flight trajectories of rockets and missiles, the fundamentals of atmospheric re-entry issues and satellite attitude.

Course Outcomes: At the end of the semester, the student will be able
CO1: To analyze the orbital elements and its manoeuvring
CO2: To analyze the trajectories of rockets and missiles
CO3: To understand the re-entry and atmosphere
CO4: To analyze the dynamics of spacecraft attitude

UNIT - I
INTRODUCTION

UNIT - II
FUNDAMENTALS OF ORBITAL MECHANICS & ORBITAL MANEUVERS
ORBITAL MECHANICS: Two-Body Motion-Circular, Elliptic, Hyperbolic, And Parabolic Orbits-Basic Orbital Elements-Ground Trace
ORBITAL MANEUVERS: In-Plane Orbit Changes-Hohmann Transfer-Bi-Elliptical Transfer-Plane Changes- Combined Maneuvers-Propulsion for Maneuvers

UNIT - III
ASCENT FLIGHT MECHANICS OF ROCKETS AND MISSILES
Two-Dimensional Trajectories of Rockets and Missiles-Multi-Stage Rockets-Vehicle Sizing-Two Stage Multi-Stage Rockets Trade-Off Ratios-Single Stage to Orbit- Sounding Rocket-Aerospace Plane-Gravity Turn Trajectories

UNIT - IV
ATMOSPHERIC REENTRY
Introduction-Steep Ballistic Reentry-Ballistic Orbital Reentry-Skip Reentry-“Doubledip” Reentry - Aero-Braking - Lifting Body Reentry

UNIT - V
SATELLITE ATTITUDE DYNAMICS
Torque Free Axi-Symmetric Rigid Body-Attitude Control for Spinning Spacecraft - Attitude Control for Non-Spinning, Spacecraft - The Yo-Yo Mechanism – Gravity - Gradient Satellite-Dual Spin Spacecraft-Attitude Determination

TEXT BOOKS
Prerequisites: Nil

Course Objectives: This course deals with different types of disasters, impacts of disasters, importance of technology in handling disaster management situations, importance of planning and risk prevention in case of occurrence of disaster, importance of education and community approach for the responsive actions to be taken in case of occurrence of disaster.

COURSE OUTCOMES: At the end of the course, the student will be able to
CO1: Identify the basic terms and types of disasters
CO2: Describe the impacts of disasters
CO3: Illustrate the role of technology in handling disaster management situations
CO4: Identify the stake-holders concerned and design the different action plans for responding in case of disaster occurrence.
CO5: Evaluate the importance of education and community approach for the responsive actions to be taken in case of disaster occurrence.

UNIT I: DEFINITIONS & TYPES OF DISASTER
Inter disciplinary–nature of the subject - Definitions – types of Disasters- Relationship between Disaster and Human and Development- Disaster Management Cycle

UNIT – II: IMPACT OF DISASTERS

UNIT – III: ROLE OF TECHNOLOGY IN DISASTER MANAGEMENT

UNIT – IV: PLANNING &RISK PREVENTION
UNIT – V: EDUCATION AND COMMUNITY PREPAREDNESS & CASE STUDIES
Essentials of disaster education – Community based disaster recovery - Building community capacity for action - Corporate sector and disaster risk reduction - A community focused approach
Case studies on different disasters in the world, Impacts, Technology usage, Risk prevention, Education and community preparedness

TEXT BOOKS

REFERENCES
5. Government of India website on Disaster Management: www.ndmindia.nic.in

Head
Dept. of Civil Engineering
Lakireddy Bali Reddy College of Engg.
Mylavaram - 521 230, Krishna Dt, A.P.
Pre-requisites: Java Programming Language.

Course Educational Objective: Students will be familiarized with the tools and web technologies necessary for business application design and development. This course covers client side and server side scripting languages to develop static and dynamic web applications.

Course Outcomes: At the end of the course, the student will be able to:
CO1: Design web pages by using HTML and CSS.
CO2: Develop user defined tags by using XML, Validating form data by using JavaScript.
CO3: Create data driven web applications by applying database connectivity techniques.
CO4: Design and implement dynamic Web Pages using server side components like servlets.
CO5: Understand the concepts of JSP and apply them in solving real world problems.

UNIT-I: HTML & CSS
CSS: Types of Cascading Style sheets; CSS Selectors, Properties: Text, Backgrounds, Font, Links, Borders, Margins, Cell padding, Layouts.

UNIT-II: JAVASCRIPT & XML
JAVASCRIPT: Introduction to JavaScript, Objects in Java Script, Form validation using JavaScript.
XML: Document Type Definition, XML Schema, Presenting XML, using XML Processors: DOM and SAX.

UNIT-III: JDBC
Introduction, Types of Drivers, java.sql package - Procedure to establish connection between java applications and database, Database operations - create, insert, delete & update using JDBC, Types of Statements, ResultSet types.

UNIT-IV: INTRODUCTION TO SERVLETS:

UNIT-V: INTRODUCTION TO JSP:
Lifecycle of JSP, scripting elements, Implicit objects, directive elements, action elements, Error Handling and Debugging. Access database from JSP pages.

TEXT BOOKS
REFERENCES
B.Tech. (VIII Sem.)  

17CS83 - SHELL PROGRAMMING

Pre-requisites: Knowledge in Operating Systems

Course Educational Objective: Introduce the student to Linux kernel programming techniques. Review basic concepts covered in the core Operating Systems course prerequisite as they are realized in the Linux platform. Discuss the Process, Inter-Process Communication Techniques.

Course Outcomes: At the end of the course, the student will be able to:

CO1: Explore LINUX Ecosystem.
CO2: Apply Linux commands
CO3: Implement Shell scripting in LINUX Kernel.
CO4: Apply Regular Expressions for Pattern Matching.
CO5: Design AWK scripts for text processing and Design Scripts for Process Creation.

UNIT – I
Introduction to LINUX: Operating System concepts, Introduction to LINUX, Features of LINUX, LINUX Kernel, Terminal and shell.

UNIT – II
LINUX Commands: man, echo, script, pwd, passwd, who, uname, date, sty, telnet, rlogin, ftp, more, printf, PATH, SU, ps, arp, mkdir, cd, rmdir, ls, cp, rm, mv, cat, wc, lp, od, ln, df, du, locate, tar, zip, chmod, umask, mount, umount, ulimit.
Introduction to Shell: Shell responsibilities, running a shell script, Pipes, Redirection, Command Substitution.

UNIT – III
Shell Programming: VI Editor, the shell as a programming Language, Shell Meta Characters, Shell Variables, Shell Commands, Control Structures, Various Shell Scripts.

UNIT – IV
Filters: simple filters and commands: pr, cmp, comm., ulink, diff, head, tail, find, cut, paste, sort, uniq, tr, w, finger.
Regular Expressions: grep, egrep, fgrep, Sed- line addressing, context addressing, text editing, substitution.

UNIT – V
Programming with awk: awk statements, variables and expressions, comparison and logical operators, Begin and End sections, decision and looping statements.
LINUX Internal: LINUX Kernel Structure, System Calls, Signals, Memory Management.

TEXT BOOKS
REFERENCES
Pre-requisites: Concept of signals and modulation theory.

Course Educational Objective: This course provides the knowledge on fundamental properties of systems and random processes. The course will give an idea about radio transmitters, receivers and noise present in the communication channel. This course also gives a brief introduction regarding transmission lines and antennas used in communication systems.

Course Outcomes (COs): At the end of the course, students will be able to
CO1: Memorize the properties of systems, random signals, and concepts of noise in communication systems, RF transmitters, receivers, transmission lines and antennas.
CO2: Understand the performance of fundamental blocks of RF transmitter, receivers, transmission lines and antennas.
CO3: Analyze the response of linear systems, impact of noise in communication systems and performance of RF transmitters and receivers.
CO4: Evaluate the mathematical concepts on noise in communication systems.

UNIT - I

UNIT-II
Random Signals: Concept and types of random variables, random processes. Cumulative distribution function and properties, Probability density function and properties. Expectation, Moments, Moment about the origin, Central moments, Variance, Skew, Skewness.

UNIT-III

UNIT-IV
Radio Receivers: Classification of radio receivers, Types of radio receivers-Tuned Radio frequency receiver and its limitations, Super hetero dyne receiver, various sections present in super hetero dyne receiver-RF section, Concept of Intermediate frequency, Automatic gain control.
UNIT-V
Transmission lines and Antennas:
Transmission lines: Fundamentals of transmission lines, characteristic impedance, losses in transmission lines, standing waves, Quarter and half wave length lines and reactance properties of transmission lines.
Antennas: Basic considerations, Terms and definitions, Directional High Frequency Antennas: Dipole Arrays, Folded dipole and applications, UHF and Microwave Antennas: Antennas with parabolic reflectors, Horn antennas, Lens antennas. (Qualitative Analysis Only)

TEXT BOOKS

REFERENCES
Pre-requisite: Differentiation and Integration of signals.

**Course Educational Objective:** This course provides basic knowledge on signals and various operations on them. It also provides knowledge about representation of Signals in frequency domain using Fourier series and Fourier Transform. This course introduces underlying concepts of sampling and reconstruction. It also provides brief overview on various systems and their applications.

**Outcomes (COs):** At the end of the course, students will be able to

- **CO1:** Understand various signals & systems with their properties.
- **CO2:** Apply Fourier series, Fourier Transform on continuous and discrete signals
- **CO3:** Analyze the Systems and observe the response of Linear Systems.
- **CO4:** Evaluate DFT, FFT for the discrete time signals

**UNIT – I**

**Signal Analysis:** Concept of Signal, Classification of Signals- Continuous Time and Analog Signals, Discrete Time and Digital Signals; Representation of Signals- Impulse, Unit Step, Unit Ramp, Signum, Decaying Exponential, Raising Exponential, Double Exponential, Complex exponential signal, Gate and Rectangular, Sinc and Sampling Signals.

**Operations on Signals:** Time Shifting, Time Scaling, Time Reversal (Folding), Amplitude Scaling, Convolution; Graphical Method of Convolution, Properties of Signals- Even and Odd, Causal and Non Causal, Bounded and Unbounded, Periodic and Aperiodic, Energy and Power, Deterministic and Random Signals.

**UNIT – II**

**Fourier Series:** Concept of Fourier Series, Trigonometric Fourier Series, Exponential Fourier Series, Relations among coefficients of Trigonometric Fourier Series and Exponential Fourier Series,


**UNIT – III**

**Sampling Theorem:** Representation of continuous time signals by its samples, Reconstruction of signal from its samples, effect of under sampling- Aliasing.


UNIT – IV
Discrete Fourier Transform: Introduction to DTFT, Concept of DFT, Computation of DFT, Computation of IDFT, Properties of DFT- Linear, Periodicity, Time Shifting, Frequency Shifting, Time Reversal, Conjugate, Basic Concept of Convolution, Linear Convolution, Circular Convolution, Circular Convolution through DFT and IDFT, Linear Convolution through DFT and IDFT.

UNIT – V
Fast Fourier Transform: Need of FFT, Radix-2 Decimation in Time FFT Algorithm, Radix-2 Decimation in Frequency FFT Algorithm, Comparison between DIT and DIF Algorithms, Inverse FFT.

TEXT BOOKS

REFERENCES

Department of Electronics & Communication Engineering
Lakireddy Bali Reddy College of Engineering
Mylavaram, Krishna Dt., Andhra Pradesh
Prerequisite: Concepts of basics of electrical engineering, generating sources.

**Course Educational Objective** This course enables the student to
- Develop energy audit procedures
- Build energy efficient motors for energy audit.
- Analyze the energy crisis using energy audit

**Course Outcomes:** At the end of the course, the student will be able to
**CO1:** Analyze the energy data of industries.
**CO2:** Carry out energy accounting and balancing.
**CO3:** Suggest methodologies for energy savings for different sources.
**CO4:** Apply the different energy instruments for auditing.

**UNIT - I: INTRODUCTION**
Types & Forms of Energy - Primary / Secondary Energy Sources – Energy Auditing: Types, classifications, energy index, cost index, pie charts, Sankey diagrams, load profiles, energy saving potential, energy audit of process industry.

**UNIT - II: ENERGY COSTING, MONITORING & TARGETING**

**UNIT - III: ENERGY EFFICIENT MOTORS**
Energy efficient motors, factors affecting efficiency, loss distribution, constructional details, characteristics - variable speed, variable duty cycle systems, motor energy audit.

**UNIT - IV: LIGHTING SYSTEMS**
Concept of lighting systems - The task and the working space - Light sources - Ballasts - Luminaries - Lighting controls - Optimizing lighting energy - Cost analysis techniques - Lighting and energy standards.

**UNIT - V: ENERGY INSTRUMENTS**
Energy Instruments wattmeter, data loggers, thermocouples, pyrometers, lux meters, tongue testers.

**TEXT BOOK**

**REFERENCES**
Pre-requisite course: -

Course Educational Objective: This course enables the student to
- Know the challenges and problems associated with the use of various energy sources, including fossil fuels, with regard to future supply and the environment.
- familiarize renewable energy technologies

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

CO1: Compare the conventional and sustainable energy resources
CO2: Illustrate the planning and operation of renewable energy systems.
CO3: Analyze various factors for the erection of the wind power plant.

UNIT I: PRINCIPLES OF SOLAR RADIATION
Role and potential of new and renewable source, the solar energy option, Environmental impact of solar power, physics of the sun, the solar constant, extraterrestrial and terrestrial solar radiation, solar radiation on tilted surface, instruments for measuring solar radiation and sun shine, solar radiation data.

UNIT II: SOLAR ENERGY COLLECTION, STORAGE AND APPLICATIONS
Flat plate and concentrating collectors, classification of concentrating collectors, orientation and thermal analysis, advanced collectors.
Different methods, Sensible, latent heat and stratified storage, solar ponds. Solar Applications- solar heating/cooling technique, solar distillation and drying, photovoltaic energy conversion.

UNIT III: WIND ENERGY
Sources and potentials, horizontal and vertical axis windmills, performance characteristics, Betz criteria

UNIT IV: BIO-MASS

UNIT V: OCEAN ENERGY
OTEC, Principles utilization, setting of OTEC plants, thermodynamic cycles. Tidal and wave energy: Potential and conversion techniques, mini-hydel power plants, and their economics.

TEXT BOOKS

REFERENCES
1. Renewable energy resources/ Tiwari and Ghosal/ Narosa, 2004
2. Renewable Energy Technologies /Ramesh & Kumar /Narosa 1997
Pre-requisites: Engineering Physics, Engineering Chemistry

Course Educational Objectives (CEOs): In this Course student will learn about- Fundamentals of nanotechnology, size dependence of properties, synthesis approaches of nanomaterials, details of characterization instruments, quantum nanostructures, carbon nano tubes (CNTs), micro/nanoscale machines and devices.

Course Outcomes (COs): At the end of the course, the student will be able to:
CO1: Acquire basic understanding on advanced materials and properties for technological applications.
CO2: Illustrate the basic science behind the properties of nanomaterials and the principles involved in experimental techniques for studying nano materials.
CO3: Familiar with fabrication techniques of quantum nanostructures and nano machines by means of size effects.
CO4: Identify current nanotechnology solutions for design, fabrication and characterization.
CO5: Realize the basics of instrumentation for nanoscale items, measurement, interpretation and analysis.

UNIT – I
SYNTHESIS METHODS
Definition of Nano-Science and Nano Technology, various nanomaterial synthesis approaches, RF plasma, sputtering, chemical methods, thermolysis, Pulsed Laser Methods.

UNIT – II
METHODS OF MEASURING PROPERTIES

UNIT – III
CARBON NANOTUBES
Carbon molecules, nature of the carbon bond, carbon nanotubes, fabrication, types, electrical, vibrational and mechanical properties, Applications of carbon nanotubes: computers, fuel cells, chemical sensors.

UNIT - IV
QUANTUM WELLS, WIRES AND DOTS
Preparation of quantum nanostructures, size and dimensionality effects, size effects, conduction electrons and dimensionality, potential wells, partial confinement, Properties dependent on density of states, Excitons.

UNIT – V
NANOMACHINES AND NANODEVICES
Micro-electro-mechanical systems (MEMS), characteristics, Nano-electro-mechanical systems (NEMS), fabrication techniques, nano devices and nano machines, Molecular and supramolecular switches.

Department of Electronics & Instrumentation Engg
Lakireddy Bali Reddy College of Engg. (Autonomous), Mylavaram - 521 230, Krishna Dt, A.P

B.Tech.(Open Electives) R17 Regulations (w.e.f. 2017-18)
TEXT BOOKS

REFERENCES
B.Tech. (VIII Sem.) 17IT81 - COMPUTER NETWORKS

Pre-requisites : Data communication

Course Educational Objective:
The Students will be able to learn the concepts, vocabulary and techniques currently used in the area of computer network, study protocols, network standards, the OSI model, IP addressing, cabling, networking components, and basic LAN design, accumulate existing state-of-the-art in network protocols, architectures, and applications, familiar with contemporary issues in networking technologies.

Course Outcomes: At the end of the course, the student will be able to:
CO1: Observe the concepts of various network architectures, physical media, and channel access techniques.
CO2: Interpret Data Link Layer and medium access protocols for direct link networks.
CO3: Analyse and implement internetworking and Routing Algorithms.
CO4: Visualize Adaptive Flow control, Adaptive retransmission and congestion avoidance mechanisms in TCP.
CO5: Examine various applications like e-mail, DNS, SNMP, and PGP.

UNIT - I

UNIT - II
Data link layer: design issues- framing, error detection and correction, CRC, Elementary data link protocols- Simplex, Stop & Wait protocols, Sliding window protocols-one-bit, go-back n, selective repeat. Medium Access Control Sub layer: Channel allocation problem- multiple access protocols- ALOHA, CSMA protocols, token bus, token ring, Ethernet, Collision free protocols, Data link layer switching, Bridges, Local internetworking, Overview of Two DLC Protocols: HDLC, PPP.

UNIT – III
Network layer: Network layer design issues- Routing algorithms- Shortest path, Flooding, Distance vector routing, Link State routing, Hierarchical Routing, Broadcast routing & Multicast Routing, ICMP, ARP, RARP, IPv4 Datagram Format, IPv4 Addresses notation, Classful Addressing, Classless Addressing, Congestion control algorithms- Leaky Bucket, Token Bucket, Quality of service.

UNIT - IV

UNIT - V
TEXT BOOKS

REFERENCES
Course Educational Objectives (CEO): To impart knowledge on the basic concepts of automation and robotics.

Course Outcomes (COs): At the end the student will be able to
CO1: Understand fundamentals in Automation.
CO2: Identify various robot configurations and components
CO3: Select and design of various end effectors.
CO4: Comprehend various Methods of robot programming.
CO5: Select appropriate actuators and sensors for a robot based on specific application

UNIT – I
AUTOMATION
Introduction, Types and strategies of automation, pneumatic and hydraulic components circuits.
Automated Material Handling: Types of equipment, functions, analysis and design of material handling systems, conveyor systems, Automated guided vehicle system.

UNIT – II
ROBOTICS

UNIT – III
END EFFECTORS: Introduction – Types of end effectors – Mechanical grippers – Vacuum cups, magnetic grippers, adhesive grippers and others – Robot / End effectors interface – Considerations in gripper selection and design

UNIT – IV
ROBOT PROGRAMMING

UNIT – V
ACTUATORS
Pneumatic, Hydraulic Actuators, servo motors, stepper motors.
SENSORS
Feedback components: Position sensors – potentiometers, resolvers, encoders; velocity sensors
ROBOT APPLICATION: Robots in Manufacturing and Non-Manufacturing applications – Future applications.

TEXT BOOKS
REFERENCES
B.Tech. (VIII Sem.) 17ME83 - MECHANICAL HANDLING SYSTEMS AND EQUIPMENTS

PRE-REQUISITES: None

COURSE EDUCATIONAL OBJECTIVE:
The main objective of this course is to provide comprehensive understanding of the issues involved in the handling of Materials. It will cover the problems in, materials handling equipment selection.

COURSE OUTCOMES: At the end of the course, the student will be able to:
CO1: Understand various industrial layouts.
CO2: Select the appropriate transportation equipment for various applications
CO3: Analyse the AGVS used in industrial applications.
CO4: Select appropriate storage system for industrial application.
CO5: Analyse the design consideration of a material handling equipment.

UNIT-I
MATERIAL HANDLING: Introduction, Bulk material handling concept, plant layout and material handling, material handling systems, material handling principles, Classification of material handling equipment, Design considerations in material handling.

UNIT-II
MATERIAL TRANSPORTATION EQUIPMENT: Unit load concepts, Industrial trucks, Conveyors, cranes, hoists and Rail Guided Vehicles, Analysis of transportation equipment.

UNIT-III

UNIT - IV

UNIT - V

TEXT BOOKS:

REFERENCES