# Bachelor of Technology (Computer Science & Engineering)
# Scheme of Studies/Examination
# Semester III

| S. No. | Course No. | Subject | L:T:P | Hours/Week | Examination Schedule (Marks) | | | | Duration of Exam (Hrs) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | Major Test | Minor Test | Practical | Total | |
| 1 | HS-201 N | Fundamentals of Management | 3:0:0 | 3 | 75 | 25 | 0 | 100 | 3 |
| 2 | CSE-201 N | Discrete Structures | 3:1:0 | 4 | 75 | 25 | 0 | 100 | 3 |
| 3 | CSE-203 N | Data Structures | 3:1:0 | 4 | 75 | 25 | 0 | 100 | 3 |
| 4 | CSE-205 N | Data Base Management Systems | 3:1:0 | 4 | 75 | 25 | 0 | 100 | 3 |
| 5 | CSE-207 N | Digital Electronics | 3:1:0 | 4 | 75 | 25 | 0 | 100 | 3 |
| 6 | CSE-209 N | Programming Languages | 3:1:0 | 3 | 75 | 25 | 0 | 100 | 3 |
| 7 | CSE-211 N | Data Structures Lab | 0:0:3 | 3 | 0 | 40 | 60 | 100 | 3 |
| 8 | CSE-213 N | Digital Electronics Lab | 0:0:3 | 3 | 0 | 40 | 60 | 100 | 3 |
| 9 | CSE-215 N | Database Management Systems Lab | 0:0:3 | 3 | 0 | 40 | 60 | 100 | 3 |
| | | **Total** | | **31** | **450** | **270** | **180** | **900** | |
| 10 | MPC 202 N | Energy Studies* | 3:0:0 | 3 | 75 | 25 | 0 | 100 | 3 |

***MPC-202 is a mandatory course which will be a non credit subject and student has to get pass marks in order to qualify for the Degree award**

| HS-201 N | Fundamentals of Management | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **0** | **-** | **75** | **25** | **100** | **3** |
| **Purpose** | **To make the students conversant with the basics concepts in management thereby leading to nurturing their managerial skills** | | | | | |
| **COURSE OUTCOMES** | | | | | | |
| **CO1** | An overview about management as a discipline and its evolution | | | | | |
| **CO2** | Understand the concept and importance of planning and organizing in an organization | | | | | |
| **CO3** | Enabling the students to know about the importance of hiring and guiding the workforce by understanding the concept of leadership and communication in detail | | | | | |
| **CO4** | To understand the concept and techniques of controlling and new trends in management | | | | | |

**UNIT-1**

**Introduction to Management:** Meaning, Definition, nature, importance & Functions, Management as Art, Science & Profession- Management as social System, Concepts of management-Administration

**Evolution of Management Thought**: Development of Management Thought- Scientific management, Administrative Theory of Management, Bureaucratic Organization, Behavioral approach (Neo Classical Theory): Human Relations Movement; Behavioral Science approach; Modern approach to management – Systems approach and contingency approach.

**UNIT-II**

**Planning**: nature, purpose and functions, types of plans, planning process, Strategies and Policies: Concept of Corporate Strategy, formulation of strategy, Types of strategies, Management by objectives (MBO), SWOT analysis, Types of policies, principles of formulation of policies

**4. Organizing**: nature, importance, process, organization structure: Line and Staff organization, Delegation of Authority and responsibility, Centralization and Decentralization, Decision Making Process , Decision Making Models, Departmentalization: Concept and Types (Project and Matrix), formal & informal organizations

**UNIT-III**

**Staffing**: concept, process, features; manpower planning; Job Analysis: concept and process; Recruitment and selection: concept, process, sources of recruitment; performance appraisal, training and development

**Directing**: Communication- nature, process, formal and informal, barriers to Effective Communication, Theories of motivation-Maslow, Herzberg, Mc Gregor ; Leadership – concept and theories, Managerial Grid, Situational Leadership. Transactional and Transformational Leadership

**UNIT-IV**

**Controlling**: concept, process, types, barriers to controlling, controlling Techniques: budgetary control, Return on investment, Management information system-MIS , TQM-Total Quality Management, Network Analysis- PERT and CPM.

**Recent Trends in Management**: -

Social Responsibility of Management–Management of Crisis, Total Quality Management, Stress Management, ., Concept of Corporate Social Responsibility (CSR) and business ethics.

Functional aspects of business: Conceptual framework of functional areas of management- Finance; Marketing and Human Resources

**Text books**


1. Management Concepts - Robbins, S.P; Pearson Education India
2. Principles of Management - Koontz & O'Donnel; (McGraw Hill)


**Recommended books**


1. Business Organization and Management – Basu ; Tata McGraw Hill
2. Management and OB-- Mullins; Pearson Education
3. Essentials of Management – Koontz, Tata McGraw-Hill
4. Management Theory and Practice – Gupta, C.B; Sultan Chand and Sons, new Delhi
5. Prasad, Lallan and S.S. Gulshan. Management Principles and Practices. S. Chand & Co. Ltd., New Delhi.
6. Chhabra, T.N. Principles and Practice of Management. Dhanpat Rai & Co., Delhi.
7. Organizational behavior – Robins Stephen P; PHI.

| CSE-201 N | Discrete Structures | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **1** | **-** | **75** | **25** | **100** | **3** |
| **Purpose** | **To provide the conceptual knowledge of Discrete structure.** | | | | | |
| **Course Outcomes** | | | | | | |
| **CO 1** | To study various fundamental concepts of Set Theory and Logics. | | | | | |
| **CO 2** | To study and understand the Relations, diagraphs and lattices. | | | | | |
| **CO 3** | To study the Functions and Combinatorics. | | | | | |
| **CO 4** | To study the Algebraic Structures. | | | | | |

**Unit 1 Set Theory & Logic**

Fundamentals - Sets and subsets, Venn Diagrams, Operations on sets, Laws of Set Theory, Power Sets and Products, Partition of sets, The Principle of Inclusion- Exclusion.

Logic : Propositions and Logical operations, Truth tables, Equivalence, Implications, Laws of Logic, Normal forms, Predicates and quantifiers, Mathematical Induction.

**Unit 2: Relations, diagraphs and lattices**

Product sets and partitions, relations and diagraphs, paths in relations and diagraphs, properties of relations, equivalence and partially ordered relations, computer representation of relations and diagraphs, manipulation of relations, Transitive closure and Warshall's algorithm, Posets and Hasse Diagrams, Lattice.

**Unit 3 Functions and Combinatorics**

Definitions and types of functions: injective, subjective and bijective, Composition, identity and inverse, Review of Permutation and combination-Mathematical Induction, Pigeon hole principle, Principle of inclusion and exclusion, Generating function-Recurrence relations.

**Unit 4: Algebraic Structures**

Algebraic structures with one binary operation - semi groups, monoids and groups, Product and quotient of algebraic structures, Isomorphism, homomorphism, automorphism, Cyclic groups, Normal sub group, codes and group codes, Ring homomorphism and Isomorphism**.**

**Books:**


- Elements of Discrete Mathematics C.L Liu, 1985, Reprinted 2000, McGraw Hill
- Discrete mathematical structures by B Kolman RC Busby, S Ross PHI Pvt. Ltd.
- Discrete Mathematics by Bisht & Dhami,Oxford University Press,2015


**Reference:**


- Discrete Mathematical Structures with Applications to Computer Science , by Tremblay J.P, and Manohar R., McGraw Hill Book Company, 1975, International Edition, 1987.
- Discrete and Combinatorial mathematics ", Ralph P., Grimaldi, Addison-Wesley Publishing Company, Reprinted in 1985.
- Discrete Mathematics and its Applications ", Kenneth H.Rosen, McGraw Hill Book Company, 1999. Sections: 7.1 to 7.5.
- Discrete Mathematics for computer scientists and Mathematicians, Joe L. Mott, Abraham

| CSE-203 N | Data Structures | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **1** | **-** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To introduce the principles and paradigms of Data Structures for design and implement the software systems logically and physically | | | | | |
| **Course Outcomes (CO)** | | | | | | |
| **CO 1** | To introduce the basic concepts of Data structure, basic data types, searching and sorting based on array data types. | | | | | |
| **CO 2** | To introduce the structured data types like Stacks, Queue, and its basic operations' implementation. | | | | | |
| **CO 3** | To introduces dynamic implementation of linked list. | | | | | |
| **CO 4** | To introduce the concepts of Tree and graph and implementation of traversal algorithms. | | | | | |

**Unit-1**

**Introduction to Data Structures**, Data Types, Built in and User Defined Data Structures, Applications of Data Structure, Algorithm Analysis, Worst, Best and Average Case Analysis, Notations of Space and Time Complexity,

**Arrays**, One Dimensional Arrays, Two Dimensional Arrays and Multi-Dimensional Arrays, Sparse Matrices, Storage Class, Basics of Recursion.

Searching from array using Linear and Binary Searching Algorithm, Sorting of array using Selection, Insertion, Bubble, Radix Algorithm

**Unit-2**

**Stacks**: Definition, Implementation of Stacks and Its Operations, Evaluation of Infix, prefix and Postfix Expression, Inter-conversion of Infix Expression, Prefix and Post-Fix Expression, Implementation of Merge Sort and Quick Sort Algorithm.

**Queues**: Definition, Sequential Implementation of Linear Queues and Its Operations, Circular Queue and Its Implementation, Priority Queues and Its Implementation, Applications of queues.

**Unit-3**

**Linked Lists**: Dynamic Implementations, Need of Dynamic Data Structures, Single Link List and Its Dynamic Implementation, Traversing, Insertion, Deletion Operations on Single Link Lists. Comparison between Static and Dynamic, Implementation of Linked List. Dynamic Implementation of Stacks and Queues.

Circular Link Lists and Doubly Link List, Dynamic Implementation of Primitive Operations on Doubly Linked Lists and Circular Link List.

**Unit-4**

**Trees**: Definition, Basic Terminology, Binary Tree, External and Internal Nodes, Static and Dynamic Implementation of a Binary Tree, Primitive Operations on Binary Trees, Binary Tree Traversals: Per-Order, In-Order And Post-Order Traversals. Representation of Infix, Post-Fix and Prefix Expressions using Trees.

Introduction to Binary Search Trees: B trees, B+ trees, AVL Trees, Threaded Binary trees, Balanced Multi-way search trees, Implementation of Heap Sort Algorithm.

**Graphs**: Basic Terminology, Definition of Undirected & Directed Graphs, Memory Representation of Graphs, Minimum-Spanning Trees, Warshal Algorithm, Graph Traversals Algorithms: Breadth First and Depth First,.

**Text Book:**

- Theory & Problems of Data Structures by Jr. Symour Lipschetz, Schaum's outline by TMH
- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
- Data Structures Using C,2E by Reema Thareja,Oxford University Press,2014

**References**:

- Shukla, Data Structures using C++, Wiley India
- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
- Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
- Data Structures and Program Design in C by Robert Kruse, PHI,
- Shukla, Data Structures using C++, Wiley India
- Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
- Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

| CSE-205 N | Data Base Management Systems | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **1** | **-** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | **To familiarize the students with Data Base Management system** | | | | | |
| **Course Outcomes** | | | | | | |
| **CO 1** | To provide introduction to relational model. | | | | | |
| **CO 2** | To learn about ER diagrams. | | | | | |
| **CO 3** | To understand about Query Processing and Transaction Processing. | | | | | |
| **CO 4** | To understand about the concept of functional dependencies. | | | | | |
| **CO 5** | To learn the concept of failure recovery. | | | | | |
| **CO 6** | To understand the concurrency control. | | | | | |

## UNIT I

**Introduction:** Concept & Overview of DBMS, Data Models, Database Languages, Database Administrator, Database Users, Three Schema architecture of DBMS.

**Entity-Relationship Model:** Basic concepts, Design Issues, Mapping Constraints, Keys, Entity-Relationship Diagram, Weak Entity Sets, Extended E-R features.

## UNIT II

**The Relational Data Model & Algebra**

**Relational Model:** Structure of relational Databases, Relational Algebra, Relational Calculus, introduction to Views, updates on views

**SQL and Integrity Constraints:** Concept of DDL, DML, DCL. Basic Structure, Set operations, Aggregate Functions, Null Values, Domain Constraints, Referential Integrity Constraints, assertions, views, Nested Sub queries, Database security application development using SQL, Stored procedures and triggers.

## UNIT III

**Relational Database Design:**

Functional Dependency, Different anomalies in designing a Database., Normalization using functional dependencies, Decomposition, Boyce-Codd Normal Form, 3NF, Normalization using multi-valued dependencies, 4NF, 5NF

**Internals of RDBMS:**

Physical data structures, Query optimization: join algorithm, statistics and cost base optimization. Transaction processing, Concurrency control and Recovery Management : transaction model properties, state serializability, lock base protocols, two phase locking.

## UNIT IV

**Failure Recovery and Concurrency Control**

Issues and Models for Resilient Operation -Undo/Redo Logging-Protecting against Media Failures.

**Concurrency Control:** Serial and Serializable Schedules-Conflict Serializability –Enforcing Serializability by Locks-Locking Systems with Several Lock Modes-Concurrency Control by Timestamps, validation.

**Transaction Management:** Serializability and Recoverability-View, Serializability-Resolving Deadlocks-Distributed Databases: Commit and Lock

**Text Books;**


1. Ramez Elmasri , Shamkant B. Navathe ,"Fundamentals of Database systems", Pearson
2. Korth, Silberschatz, Sudarshan: database concepts, MGH,


**Reference Books:**


1. R. Ramakrishnan and J. Gehrks database management system; MGH, International edition,
2 C. J. Date, data base systems: 7th edition, Addison Wesley, Pearson Education,
Chakrabarti, Advance database management systems , Wiley Dreamtech

| CSE-207 N | Digital Electronics | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **1** | **-** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | **To learn the basic methods for the design of digital circuits and provide the fundamental concepts used in the design of digital systems.** | | | | | |
| **Course Outcomes** | | | | | | |
| **CO 1** | To introduce basic postulates of Boolean algebra and shows the correlation between Boolean expressions | | | | | |
| **CO 2** | To introduce the methods for simplifying Boolean expressions | | | | | |
| **CO 3** | To outline the formal procedures for the analysis and design of combinational circuits and sequential circuits | | | | | |
| **CO 4** | To introduce the concept of memories and programmable logic devices. | | | | | |

## UNIT I MINIMIZATION TECHNIQUES AND LOGIC GATES

Minimization Techniques: Boolean postulates and laws - De-Morgan's Theorem, Principle of Duality, Boolean expression - Minimization of Boolean expressions, Minterm, Maxterm, Sum of Products (SOP), Product of Sums (POS), Karnaugh map Minimization - Don't care conditions, Quine - McCluskey method of minimization.

Logic Gates: AND, OR, NOT, NAND, NOR, Exclusive-OR and Exclusive-NOR- Implementations of Logic Functions using gates, NAND-NOR implementations - Multi level gate implementations- Multi output gate implementations. TTL and CMOS Logic and their characteristics, Tristate gates.

## UNIT II COMBINATIONAL CIRCUITS

Design procedure - Half adder, Full Adder, Half subtractor, Full subtractor , Parallel binary adder, parallel binary Subtractor, Fast Adder, Carry Look Ahead adder, Serial Adder/Subtractor, BCD adder, Binary Multiplier, Binary Divider, Multiplexer/ De-multiplexer, decoder, encoder, parity checker, parity generators, code converters, Magnitude Comparator.

## UNIT III SEQUENTIAL CIRCUITS

Latches, Flip-flops - SR, JK, D, T, and Master-Slave - Characteristic table and equation, Application table, Edge triggering, Level Triggering, Realization of one flip-flop using other flip-flops, serial adder/subtractor, Asynchronous Ripple or serial counter, Asynchronous Up/Down counter, Synchronous counters, Synchronous Up/Down counters, Programmable counters, Design of Synchronous counters: state diagram, State table, State minimization, State assignment, Excitation table and maps-Circuit implementation, Modulo-n counter, 555 Timer, Registers - shift registers, Universal shift registers, Shift register counters, Ring counter, Shift counters, Sequence generators.

## UNIT IV MEMORY DEVICES

Classification of memories - ROM: ROM organization, PROM, EPROM, EEPROM, EAPROM, RAM: - RAM organization - Write operation, Read operation, Memory cycle, Timing wave forms, Memory decoding, memory expansion, Static RAM Cell, Bipolar RAM cell, MOSFET RAM cell structure, Dynamic RAM cell structure, Programmable Logic Devices - Programmable Logic Array (PLA), Programmable Array Logic (PAL), Implementation of PLA, PAL using ROM. Introduction to Field Programmable Gate Arrays (FPGA).

**TEXT BOOKS**


**1.** Donald P. Leach and Albert Paul Malvino, Digital Principles and Applications, 8th Edition, TMH, 2003.M.

2. Morris Mano, Digital Design, 3rd Edition, Prentice Hall of India Pvt. Ltd., 2003 / Pearson Education (Singapore) Pvt. Ltd., New Delhi, 2003.


**REFERENCES**


**1.** A.K. Maini, Digital Electronics, Wiley India

2. John F. Wakerly, Digital Design, Fourth Edition, Pearson/PHI, 2006

2. John. M Yarbrough, Digital Logic Applications and Design, Thomson Learning, 2002.

3. S. Salivahanan and S. Arivazhagan, Digital Circuits and Design, 3rd Edition., Vikas Publishing House Pvt. Ltd, New Delhi, 2006

4. William H. Gothmann, Digital Electronics, 2nd Edition, PHI, 1982.

5. Thomas L. Floyd, Digital Fundamentals, 8th Edition, Pearson Education Inc, New Delhi, 2003

6. Donald D. Givone, Digital Principles and Design, TMH, 2003.

| CSE-209 N | Programming Languages | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **1** | **-** | **75** | **25** | **100** | **3 Hour** |
| **Purpose** | To introduce the principles and paradigms of programming languages for design and implement the software intensive systems. | | | | | |
| **Course Outcomes (CO)** | | | | | | |
| **CO 1** | To introduce the basic concepts of programming language, the general problems and methods related to syntax & semantics. | | | | | |
| **CO 2** | To introduce the structured data objects, subprograms and programmer defined data types. | | | | | |
| **CO 3** | To outline the sequence control and data control. | | | | | |
| **CO 4** | To introduce the concepts of storage management using programming languages. | | | | | |

**Unit-I: Introduction, Syntax and Semantics**

**Introduction:** A brief history, Characteristics of a good programming language, Programming language translators compiler & interpreters , Elementary data types – data objects, variable & constants, data types, Specification & implementation of elementary data types, Declarations, type checking & type conversions, Assignment & initialization, Numeric data types, enumerations, Booleans & characters.

**Syntax & Semantics:** Introduction, general problem of describing syntax, formal method of describing syntax, attribute grammar dynamic semantic.

**Unit-II: Structured data objects, Subprograms and Programmer Defined Data Types**

**Structured data objects:** Structured data objects & data types, specification & implementation of structured data types, Declaration & type checking of data structure, vector & arrays, records Character strings, variable size data structures, Union, pointer & programmer defined data objects, sets, files.

**Subprograms and Programmer Defined Data Types:** Evolution of data type concept abstraction, encapsulation & information hiding, Subprograms, type definitions, abstract data types, over loaded subprograms, generic subprograms.

**Unit–III: Sequence Control and Data Control**

**Sequence Control:** Implicit & explicit sequence control, sequence control within expressions, sequence control within statement, Subprogram sequence control: simple call return, recursive subprograms, Exception & exception handlers, co routines, sequence control. Concurrency – subprogram level concurrency, synchronization through semaphores, monitors & message passing

**Data Control:** Names & referencing environment, static & dynamic scope, block structure, Local data & local referencing environment, Shared data: dynamic & static scope, Parameter & parameter transmission schemes.

**Unit-IV: Storage Management and Programming Languages**

**Storage Management:** Major run time elements requiring storage, programmer and system controlled storage management & phases, Static storage management, Stack based storage management, Heap storage management, variable & fixed size elements.

**Programming Languages:** Introduction to procedural, non-procedural, structured, logical, functional and object oriented programming language, Comparison of C & C++ programming languages.

**Text Books:**


1. Terrence W. Pratt, Marvin V. Zelkowitz, Programming Languages Design & Implementation, Pearson.
2. Allen Tucker & Robert Noonan, Programming Languages–Principles and Paradigms, Tata McGraw-Hill, 2009.


**Reference Books:**


1. Ellis Horowitz, Fundamentals of Programming Languages, Galgotia Publications, 2010.
2. C. Ghezzi, Programming Languages Concepts, Wiley Publications, 2010.

| CSE-211 N | Data Structures Lab | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **3** | **40** | **60** | **100** | **3** |
| **Purpose** | To introduce the principles and paradigms of Data Structures for design and implement the software systems logically and physically | | | | | |
| **Course Outcomes (CO)** | | | | | | |
| **CO 1** | To introduce the basic concepts of Data structure, basic data types, searching and sorting based on array data types. | | | | | |
| **CO 2** | To introduce the structured data types like Stacks and Queue and its basic operation's implementation. | | | | | |
| **CO 3** | To introduces dynamic implementation of linked list. | | | | | |
| **CO 4** | To introduce the concepts of Tree and graph and implementation of traversal algorithms. | | | | | |

1. Write a program for Binary serach methods.
2. Write a program for insertion sort, selection sort and bubble sort.
3. Write a program to implement Stack and its operation.
4. Write a program for quick sort.
5. Write a program for merge sort.
6. Write a program to implement Queue and its operation.
7. Write a program to implement Circular Queue and its operation.
8. Write a program to implement singly linked list for the following operations: Create, Display, searching, traversing and deletion.
9. Write a program to implement doubly linked list for the following operations: Create, Display, inserting, counting, searching, traversing and deletion.
10. Write a program to implement circular linked list for the following operations: Create, Display, inserting, counting, searching, traversing and deletion.
11. Write a program to implement insertion, deletion and traversing in B tree

**NOTE:**
**At least seven experiments are to be performed from above list and the concerned institution as per the scope of the syllabus may set remaining eight.**

| CSE-213 N | Digital Electronics Lab | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Minor Test** | **Practical** | **Total** | **Time** |
| **0** | **0** | **3** | **40** | **60** | **100** | **3** |
| **Purpose** | To learn the basic methods for the design of digital circuits and systems. | | | | | |
| **Course Outcomes** | | | | | | |
| **CO 1** | To Familiarization with Digital Trainer Kit and associated equipment. | | | | | |
| **CO 2** | To Study and design of TTL gates | | | | | |
| **CO 3** | To learn the formal procedures for the analysis and design of combinational circuits. | | | | | |
| **CO 4** | To learn the formal procedures for the analysis and design of sequential circuits | | | | | |

**LIST OF EXPERIMENTS:**

1. Familiarization with Digital Trainer Kit and associated equipment.
2. Study of TTL gates AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
3. Design and realize a given function using K-Maps and verify its performance.
4. To verify the operation of Multiplexer and De-multiplexer.
5. To verify the operation of Comparator.
6. To verify the truth table of S-R, J-K, T, D Flip-flops.
7. To verify the operation of Bi-directional shift register.
8. To design and verify the operation of 3-bit asynchronous counter.
9. To design and verify the operation of asynchronous Up/down counter using J-K FFs.
10. To design and verify the operation of asynchronous Decade counter.
11. Study of TTL logic family characteristics.
12. Study of Encoder and Decoder.
13. Study of BCD to 7 segment Decoder.

**NOTE:**

**At least ten experiments are to be performed from above list and the concerned institution as per the scope of the syllabus may set remaining five.**

| CSE-215 N | DATABASE MANAGEMENT SYSTEMS LAB | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Minor Test** | **Practical** | **Total** | **Time** |
| **-** | **-** | **3** | **40** | **60** | **100** | **3** |
| **Purpose** | **To familiarize the students with the basics of Operating Systems** | | | | | |
| **Course Outcomes** | | | | | | |
| CO1 | To understand basic DDL commands | | | | | |
| CO 2 | To learn about DML and DCL commands | | | | | |
| CO 3 | To understand the sql queries using SQL operators | | | | | |
| CO 4 | To understand the concept of relational algebra | | | | | |
| CO5 | To learn various queries using date and group functions | | | | | |
| CO6 | To understand the nested queries | | | | | |
| CO7 | To learn view, cursors and triggers. | | | | | |

1. Write the queries for Data Definition Language (DDL) in RDBMS.
2. Write the queries for Data Manipulation Language (DML) in RDBMS.
3. Write the queries for Data Control Language (DCL) in RDBMS.
4. Write SQL queries using logical operations (=,,etc)
5. Write SQL queries using SQL operators
6. Write SQL query using character, number, date and group functions
7. Write SQL queries for relational algebra
8. Write SQL queries for extracting data from more than one table
9. Write SQL queries for sub queries, nested queries
10. Concepts for ROLL BACK, COMMIT & CHECK POINTS
11. Create VIEWS, CURSORS and TR
12. High level language extension with Cursors.
13. High level language extension with Triggers.
14. To study the concept of Procedures and Functions..

| MPC-202 N | ENERGY STUDIES | | | | | |
|---|---|---|---|---|---|---|
| **Lecture** | **Tutorial** | **Practical** | **Major Test** | **Minor Test** | **Total** | **Time** |
| **3** | **-** | **-** | **75** | **25** | **100** | **3** |
| **Purpose** | To make the students conversant with the basics concepts and conversion of various form of Energy | | | | | |
| **Course Outcomes** | | | | | | |
| **CO1** | An overview about Energy , Energy Management, Audit and tariffs | | | | | |
| **CO2** | Understand the Layout and working of Conventional Power Plants | | | | | |
| **CO3** | Understand the Layout and working of Non-Conventional Power Plants | | | | | |
| **CO4** | To understand the role of Energy in Economic development and Energy Scenario in India | | | | | |

**UNIT-I**

**Introduction**: Types of energy, Conversion of various forms of energy, Conventional and Non-conventional sources, Need for Non-Conventional Energy based power generation.

**Energy Management:** General Principles of Energy Management, Energy Management Strategy.

**Energy Audit:** Need, Types, Methodology and Approach.

**UNIT-II**

**Conventional Energy sources:** Selection of site**,** working of Thermal, Hydro, Nuclear and Diesel power plants and their schematic diagrams & their comparative advantages- disadvantages.

**UNIT-III**

**Non-Conventional Energy sources:** Basic principle, site selection of Solar energy power plant, photovoltaic technologies, PV Systems and their components, Wind energy power plant , Bio energy plants ,Geothermal energy plants and tidal energy plants. MHD

**UNIT-IV**

**Energy Scenario**: Lay out of power system, Role of Energy in Economic development, energy demand, availability and consumption, Commercial and Non-commercial energy, Indian energy scenario, long term energy scenario, energy pricing, energy sector reforms in India, energy strategy for the future.

**References:**


1. Energy Studies-Wiley Dream tech India.
2. Non-conventional energy resources- Shobhnath Singh, Pearson.
3. Soni,Gupta,Bhatnagar: Electrical Power Systems – DhanpatRai& Sons
4. NEDCAP: Non Conventional Energy Guide Lines
5. G.D. Roy :Non conventional energy sources
6. B H Khan :Non Conventional energy resources - McGraw Hill
7. Meinel A B and Meinal M P,Addison:Applied Solar Energy- Wesley Publications
7. George Sutton: Direct Energy Conversion -McGraw