KESHAV MEMORIAL INSTITUTE OF TECHNOLOGY

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

COURSE STRUCTURE (KR23 Regulations)
Applicable from A.Y 2023-24 Admitted Batch

II YEAR I SEMESTER

S.No.	Course Code	Course Title	L	T	P	Credits
1	23CC301ES	Digital Electronics	3	0	0	3
2	23CC302PC	Database Management Systems	3	0	0	3
3	23CC303BS	Computer Oriented Statistical Methods	3	1	0	4
4	23CC304PC	Discrete Mathematics	3	0	0	3
5	23CC305PC	Object Oriented Programming through Java	3	0	0	3
6	23CC306PC	Database Management Systems Lab	0	0	2	1
7	23CC307PC	Object Oriented Programming through Java Lab	0	0	2	1
8	23CS308PC	Skill Development Course 1	0	0	4	2
9	*23MC309HS	Gender Sensitization Lab	0	0	2	0
		Total	**15**	**1**	**10**	**20**

Note: * Mandatory Course: Satisfactory/Unsatisfactory

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

COURSE STRUCTURE (KR23 Regulations)
Applicable from A.Y 2023-24 Admitted Batch

II YEAR II SEMESTER

S.No.	Course Code	Course Title	L	T	P	Credits
1	23CC401PC	Automata Theory and Compiler Design	3	0	0	3
2	23CC402PC	Data Structures	3	0	0	3
3	23CC403PC	Operating Systems	3	0	0	3
4	23CC404PC	Machine Learning	3	0	0	3
5	23CC405PC	Computer Organization and Architecture	3	0	0	3
6	23CC406PC	Data Structures Lab	0	0	2	1
7	23CC407PC	Operating Systems Lab	0	0	2	1
8	23CC408PC	Machine Learning Lab	0	0	2	1
9	23CS409PC	Real-time Research Project/Societal Related Project	0	0	4	2
10	*23MC410HS	Constitution of India	3	0	0	0
		Total	**18**	**0**	**10**	**20**

Note: * Mandatory Course: Satisfactory/Unsatisfactory

B.Tech. in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year I Semester Course Syllabus (KR23)

DIGITAL ELECTRONICS (23CC301ES)

Common for CSE, CSE (DS), IT

L	T	P	C
3	0	0	3

Pre-requisites/ Co-requisites: NIL

Course Objectives: The course will help to

1. Learn Binary Number system and Boolean algebra.
2. Understand the basic techniques of gate level minimization.
3. Learn the concepts of combinational logic circuits.
4. Learn the concepts of sequential circuits.
5. Understand the concepts of memories and Asynchronous sequential circuits.

Course Outcomes: The student will be able to

1. Implement Number base conversions and Binary Codes.
2. Apply the Postulates of Boolean algebra for minimization of Boolean functions.
3. Design and analyze combinational circuits.
4. Design and analyze sequential circuits.
5. Describe the types of memories, PLD's and analyze Asynchronous Sequential circuits.

UNIT - I:

Boolean Algebra and Logic Gates: Digital Systems, Binary Numbers, Number base conversions, Octal and Hexadecimal Numbers, complements, Signed binary numbers, Binary codes-(BCD, Gray codes), Error Detection and correction codes, Binary logic.

Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and properties of Boolean algebra, Boolean functions, canonical and standard forms, other logic operations, Digital logic gates.

UNIT - II:

Gate–Level Minimization: The map method-Sum of products and product of sums simplification, Two, Three, Four and Five-variable Karnaugh-map method, Sum of products and product of sums simplification with Don't-care conditions, NAND and NOR implementation, other Two-level implementations, Exclusive – Or function.

UNIT - III:

Combinational Logic: Combinational Circuits, Analysis procedure Design procedure, Binary Adder-Subtractor Decimal Adder, Binary multiplier, 2-bit magnitude comparator, 2 to 4 Decoder,3 to 8 Decoder, 4 to 2 Encoder, 8 to 3 Encoder, 4 to 1 line Multiplexer,8 to 1 line Multiplexer, 1 to 4 line Demultiplexer,1 to 8 line Demultiplexer.

UNIT - IV:

Sequential Logic: Sequential circuits, latches, Flip-Flops Analysis of clocked sequential circuits, Binary Storage and Registers, left shift Register, Right shift Register, 2bit Ripple counter, 3bit Ripple counter, 2bit synchronous counter, 3-bit synchronous counter, Mod-6 Counter and Johnson counter.

UNIT – V:

Memories and Asynchronous Sequential Logic: Introduction, Random-Access Memory, Memory Decoding, Read-only memory, Programmable logic Array programmable Array logic, Sequential Programmable Devices. Introduction to Asynchronous Sequential circuits, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of state and Flow Tables, Race-Free state Assignment Hazards, Design Example.

TEXT BOOKS:

1. Digital Design ,M. Morris Mano, Michael D. Ciletti , Fifth Edition, Pearson Education/PHI, 2013
2. Fundamentals of Logic Design, Charles H. Roth, Larry L. Kinney, sixth Edition, Cengage Learning.
3. Switching Theory And Logic Design, A. Anand Kumar ,Third Edition, PHI Learning

REFERENCE BOOKS:

1. Switching and Finite Automata Theory, Zvi. Kohavi, Tata McGraw Hill.
2. Switching and Logic Design, C.V.S. Rao, Pearson Education.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year I Semester Course Syllabus (KR23)
DATABASE MANAGEMENT SYSTEMS (23CC302PC)
Common for CSE, CSE (DATA SCIENCE), CSE (AI & ML), IT

L	T	P	C
3	0	0	3

Prerequisites/ Corequisites: NIL

Course Objectives: **The course will help to**

1. Understand the concepts of database management systems and ER Diagrams.
2. Gain knowledge on relational model and integrity constraints.
3. Master the basics of SQL, Triggers and Stored Procedures.
4. Understand the concepts of Normalization.
5. Know the transaction management and concurrency control techniques.

Course Outcomes: The student will be able to

1. Recognize the basic concepts and the applications of database systems and design ER models.
2. Design relation models to represent simple database application and apply integrity constraints.
3. Master the basics of SQL for retrieval and management of data and apply triggers and stored procedures into databases.
4. Apply Normalization techniques to normalize relations.
5. Be acquainted with the basics of transaction processing and concurrency control.

UNIT – I:

Database System Applications: File Systems versus a DBMS, Database Languages, the Data Model, Levels of Abstraction in a DBMS, Data Independence, Structure of a DBMS, Introduction to DBA, Roles of DBA.

Introduction to Database Design: Database Design and ER Diagrams, Entities, Attributes, and Entity Sets, Relationships and Relationship Sets, Additional Features of the ER Model, Conceptual Design With the ER Model.

UNIT – II:

Introduction to the Relational Model: Integrity constraint over relations, Types of Integrity Constraints Other Key Constraint – NULL, NOT NULL, CHECK, UNIQUE, aggregation operators, querying relational data, logical database design, and Introduction to views, destroying/altering tables and views.

UNIT - III

SQL: Select Queries, Constraints, Triggers and Procedures: Form of basic SQL query, UNION, INTERSECT, and EXCEPT, Nested Queries, Co-related Queries, NULL values, complex integrity constraints in SQL, triggers and active databases, Stored Procedures IN,OUT parameters.

Concept of Joins: Join, Outer Join, Left Outer Join, Right Outer Join, Self-Join.

UNIT – IV

Schema Refinement: Problems caused by redundancy, decompositions, problems related to decomposition, reasoning about functional dependencies, FIRST, SECOND, THIRD normal forms, BCNF, lossless join decomposition, multi-valued dependencies, FOURTH normal form, FIFTH normal form.

UNIT – V:

Introduction to Transactions: Transaction Concept, Transaction State, Implementation of Atomicity and Durability, Concurrent Executions, Serializability, Recoverability, Implementation of Isolation, testing for serializability, Lock Based Protocols, Timestamp Based Protocols, Validation- Based Protocols, Multiple Granularity, Recovery and Atomicity, Log–Based Recovery, Recovery with Concurrent Transactions.

TEXT BOOKS:

1. Database Management Systems‖ - Raghurama Krishnan, Johannes Gehrke, Tata McGraw Hill, 3th Edition, 2014.
2. Database System Concepts- Silber Schatz, Korth, McGraw Hill, VI edition, 2013.

REFERENCE BOOKS:

1. Database Systems design, Implementation and Management - Peter Rob& Carlos Coronel, 9th Edition, Cengage Learning.
2. Fundamentals of Database Systems- Elmasri Navrate, Pearson Education, 7th edition 2017.
3. Introduction to Database Systems- C.J.Date, Pearson Education, 8th edition 2006.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year I Semester Course Syllabus (KR23)

COMPUTER ORIENTED STATISTICAL METHODS (23CC303BS)

Common for CSE, CSE (DATA SCIENCE), IT

L	T	P	C
3	1	0	4

Prerequisite/Corequisite: Knowledge of basic probability and statistics

Course Objectives: The course will help to learn

1. The theory of Probability, Probability distributions of single and multiple random variables
2. Introduction to random variables, discrete Probability distributions
3. Continuous Probability distributions, sampling theory
4. Estimations, testing of hypothesis and making statistical inferences
5. Stochastic process and Markov chains.

Course outcomes: The student will be able to

1. Apply the concepts of probability and distributions to case studies.
2. Formulate and solve problems involving random variables and apply statistical methods for analyzing experimental data.
3. Using this concept of estimation and testing of hypothesis to case studies.
4. Correlate the concepts of one unit to the concepts in other units.
5. Analyze the concept of Stochastic Process to real time Problems.

UNIT – I:

Probability: Sample Space, Events, Counting Sample Points, Probability of an Event, Additive Rules, Conditional Probability, Independence, and the Product Rule, Baye's Rule,

Random Variables and Probability Distributions: Concept of a Random Variable, Discrete Probability Distributions, Continuous Probability Distributions.

UNIT – II:

Expectation and discrete distributions: Mean of a Random Variable, Variance and Covariance of Random Variables, Means and Variances of Linear Combinations of Random Variables, Chebyshev's Theorem.

Discrete Probability Distributions: Binomial Distribution, Poisson distribution.

UNIT – III:

Continuous and Sampling Distributions: Uniform Distribution, Normal Distribution, Areas under the Normal Curve, Applications of the Normal Distribution, Normal Approximation to the Binomial Distributions.

Fundamental Sampling Distributions: Random Sampling, Some Important Statistics, Sampling Distributions, Sampling Distribution of Means and the Central Limit Theorem, t - Distribution, F-Distribution.

UNIT – IV:

Sample Estimation: Introduction, Statistical Inference, Classical Methods of Estimation, Single Sample: Estimating the mean, standard error, point estimation, interval estimation.

Tests of Hypothesis: Test of significance, null and alternative hypotheses, Errors in sampling, level of significance. Large sample test: Test of significance for single proportion, difference of proportions, single mean and difference of means. Small Sample Tests: t-Test for single mean, differences of Means. F- test for equality of two population variances. Chi-Square test of Goodness of fit.

UNIT-V:

Stochastic Processes and Markov Chains: Introduction to Stochastic processes- Markov process. Transition Probability, Transition Probability Matrix, First order and Higher order Markov process, n-step transition probabilities, Markov chain, Steady state condition, Markov analysis.

TEXT BOOKS:

1. Ronald E. Walpole, Raymond H. Myers, Sharon L. Myers, Keying Ye, Probability & Statistics for Engineers & Scientists, 9th Ed. Pearson Publishers.
2. S C Gupta and V K Kapoor, Fundamentals of Mathematical statistics, Khanna publications.
3. S.D.Sharma, Operations Research, Kedarnath and Ramnath Publishers, Meerut, Delhi.

REFERENCE BOOKS:

1. T.T. Soong, Fundamentals of Probability and Statistics for Engineers, John Wiley & Sons, Ltd, 2004.
2. Sheldon M Ross, Probability and statistics for Engineers and scientists, academic press.
3. Miller and Freund's, Probability and Statistics for Engineers, 8th Edition, Pearson Educations.

B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year I Semester Course Syllabus (KR23)

DISCRETE MATHEMATICS (23CC304PC)

Common for CSE, CSE (DATA SCIENCE), CSE (AIML), IT

L	T	P	C
3	0	0	3

Prerequisite/Corequisite: Knowledge of basic mathematics.

Course Objectives: The course will help to

1. Learn elementary discrete mathematics for computer science and engineering, formal logic notation, methods of proof.
2. Introduce sets, relations, discrete structures, functions.
3. Understand algebraic systems, semi groups, lattices, partially ordered sets, Boolean Algebra.
4. Implement counting techniques, Permutations and Combinations with and without repetitions, Binomial, Multinomial theorems.
5. Analyze elementary graph theory, Concept of Trees, properties, Spanning trees, Planar graphs, Hamiltonian, euler circuits.

Course Outcomes: The student will be able to

1. Understand and construct precise mathematical proofs.
2. Apply logic and set theory to formulate precise statements.
3. Analyze and solve counting problems on finite and discrete structures.
4. Describe and manipulate sequences.
5. Apply graph theory in solving computing problems.

UNIT – I

Mathematical logic: Introduction, Statements and Notation, Connectives, Well-formed formulas and Truth Tables, Tautologies and Contradictions, Equivalence of Formulas, Tautological implications.

Normal Forms: Disjunctive Normal Form, Conjunctive Normal form, Principal Disjunctive Normal form, Principal Conjunctive Normal form(with and without truth tables). Theory of Inference for the Statement Calculus, Rules of Inference, Consistency of Premises and Indirect method of Proof, The Predicate Logic, Inference Theory of the Predicate Logic.

UNIT – II

Set theory: Introduction to Set theory, Types of Sets, Operations on Sets and Properties of Set Algebra, Cartesian Product, Relations. Properties of Relations, Compatability Relations, Equivalence Relations, Representation of Relations, Composition of two Relations

Representation of Discrete Structures: Partial Ordering Relations, Partial Order sets, Hasse Diagrams, Functions, Types of functions.

UNIT - III

Algebraic Structures: Introduction, Binary Operation and Properties, , Semi groups and Monoids, Groups, Examples, Sub groups, Examples,

Homomorphism and Isomorphism: Properties of Homomorphism and Isomorphism of Groups, Automorphism of a group, epimorphism of a group, endomorphism of a group with examples.

UNIT - IV

Elementary Combinatorics : Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with Repetitions, Enumerating Permutation with Constrained Repetitions, Binomial Coefficient, The Binomial and Multinomial Theorems, The Principle of Exclusion.

UNIT - V

Graph Theory: Basic Concepts, Isomorphism and Subgraphs, Trees and their Properties, Spanning Trees, Directed Trees, Binary Trees, Planar Graphs, Euler's Formula, Multi-graphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four-Color Problem.

TEXT BOOKS:

1. Discrete Mathematical Structures with Applications to Computer Science: J.P. Tremblay, R. Manohar, McGraw-Hill, 1st ed.

2. Discrete Mathematics for Computer Scientists & Mathematicians: Joe l. Mott, Abraham Kandel, Teodore P. Baker, Prentis Hall of India, 2nd ed.

REFERENCE BOOKS:

1. Discrete and Combinatorial Mathematics - an applied introduction: Ralph.P. Grimald, Pearson education, 5th edition.

2. Discrete Mathematical Structures: Thomas Kosy, Tata McGraw Hill publishing co.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year I Semester Course Syllabus (KR23)

OBJECT ORIENTED PROGRAMMING THROUGH JAVA (23CC305PC)

Common for CSE, CSE (DATA SCIENCE) & CSE (AI & ML)

L	T	P	C
3	0	0	3

Prerequisite/ Corequisite:

1. 23CS103ES - Programming for Problem Solving Course

Course Objectives: The course will help to

1 Learn the object-oriented programming concepts.

2 Understand packages and I/O streams in solving problems.

3 Introduce the concepts of exception handling and multithreading.

4 Master the Java Collections Framework for efficient and structured data handling.

5 Gain proficiency in using JDBC for effective Java database connectivity and interaction.

Course Outcomes: The student will be able to

1 Apply concepts of OOPs such as data abstraction, inheritance, polymorphism, encapsulation principles in structuring computer applications for solving problems.

2 Use packages to organize and structure projects and I/O streams to read from and write to files.

3 Apply the concepts of exception handling and multi-threading in a given real time problem.

4 Analyze appropriate collections to solve programming problems.

5 Build java applications to utilize advanced mechanism database connectivity.

UNIT– I:

Object-Oriented Thinking- A way of viewing the world –Methods, Responsibilities, Classes and Instances, Class Hierarchies- Inheritance, Method binding, Encapsulation, Abstraction. Summary of Object - Oriented concepts. Java buzz words, An Overview of Java, Data types, Variables and operators, expressions, control statements, Introducing classes, Methods and Classes.

Arrays- One Dimensional Array, Second Dimensional Array, Jagged Arrays, String handling. StringBuilder, StringBuffer, StringTokenizer(), String API‘s like length(), substring(), charAt(), indexOf(), replace(), toCharArray()

Inheritance– Inheritance concept, Inheritance basics, Member access, Constructors, Types of constructors, Creating Multilevel hierarchy, super uses, this uses, static uses, static and instance blocks, using final with Inheritance, Polymorphism Method overriding method overloading, abstract classes, Object class, forms of inheritance -specialization, benefits of inheritance, costs of inheritance.

UNIT – II:

Introduction to Packages- Defining a Package, CLASSPATH, Access protection, importing packages. Interfaces- defining an interface, implementing interfaces, Nested interfaces, applying interfaces, variables in interfaces and extending interfaces.

Stream based I/O (java.io) – The Stream Classes-Byte streams and Character streams, reading console Input and Writing Console Output, File class, Reading and writing Files, Reading and Writing Objects to a file, Serialization, De-Serialization, transient keyword, transient and static variables.

UNIT – III:

Exception handling- Fundamentals of exception handling, Exception types, Termination or presumptive models, Uncaught exceptions, using try and catch, multiple catch clauses, nested try statements, throw, throws and finally, built- in exceptions, creating own exception subclasses.

Multithreading- Differences between thread-based multitasking and process-based multitasking, Java thread model,thread life cycle, different ways of creating threads, thread priorities, synchronized keyword and synchronized block,inter thread communication, Producer Consumer Problem. Thread class APIs.

UNIT – IV:

The Collections Framework (java.util)- Collections overview, Collection Interfaces List, Map and Set, The Collection classes- Array List, Linked List, Hash Set, Tree Set, Priority Queue, Array Deque. Accessing a Collection via an Iterator, Using an Iterator, The For-Each alternative, Map Interfaces and Classes, Comparators, Arrays, Stack,Vector, Enumerations, Auto boxing, Scanner class.

UNIT – V:

An Overview Of Advanced Java: Introduction to JDBC, Types of JDBC Drivers, Connectivity with Oracle/ MySQL, Driver Manager API, Connection API, Statement API- Prepared Statement, invoking stored procedure using Callable Statement, Result Set, Properties of Result Set. Transaction Management using JDBC API, auto commit, save point and rollback methods. Exception Handling in JDBC.

TEXT BOOKS:

1. Java The Complete reference- Herbert Schildt, 9th Edition, Mc Graw Hill Education (India) Pvt. Ltd, 2021.
2. Java Database Best Practices- George Reese, O'Reilly Media, 2003.

REFERENCE BOOKS:

1. Introduction to Java programming - Y. Daniel Liang, Pearson Education, 2012.
2. Object Oriented Programming with Java: Essentials and Applications R.Buyya, ST.Selvi, X.Chu TMH 2009
3. An Introduction to programming and OO design using Java- J. Nino and F A.Hosch, John Wiley & sons, 2008.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year I Semester Course Syllabus (KR23)

DATABASE MANAGEMENT SYSTEMS LAB (23CC306PC)

Common for CSE, CSE (DATA SCIENCE), CSE (AI & ML), IT

L	T	P	C
0	0	2	1

Prerequisite/ Corequisite: NIL

Course Objectives: The course will help to

1. Introduce ER data model, database design and normalization.
2. Learn SQL basics for data definition and data manipulation.
3. Design database schema for a given application and apply normalization.
4. Acquire skills in using SQL commands for data definition and data manipulation.
5. Develop solutions for database applications using procedures, cursors and triggers.

Course Outcomes: The student will be able to

1. Design database schema for a given application.
2. Acquire skills in using SQL commands for data definition and data manipulation and apply normalization.
3. Develop solutions for database applications using joins and nested queries.
4. Construct queries using SQL and Demonstrate creation and usage of Triggers, Views and Stored Procedures using SQL.
5. Apply and relate various advanced SQL queries related to DCL.

List of Exercises

Scenario 1:

Product-Sales database: **South Wind**

South wind database is a sample database used by Organization. The database contains the sales data for South Wind Traders, it is foods export-import Company. Using this schema to demonstrate how customers can choose and order products, how orders are placed and how those products get delivered to the customer.

Products: This Entity will have all the products details where suppliers will supply products based on customers demand.

Supplies: This Entity will supply the products demanded by the customers.

Shippers: This Entity will take the orders from suppliers and deliver to customers.

Employees: Employees will monitor the orders placed by customers.

Invoices: This Entity will take care of the billing process based on customer order. Etc. identify some more entities and find out the relationship between them.

A product-sale the above process involves many steps like

1. Analyzing the problem and identifying the Entities and Relationships,
2. E-R Model
3. Relational Model

4. Normalization
5. Creating the data base
6. Querying.

Exercise 1: E-R Model

Analyze and come up with the entities in it. Identify what data has to be persisted in the database. This contains the entities, attributes etc. Identify the primary keys for all the entities. Identify the other keys like Foreign Key and constraints like NULL, NOT NULL, CHECK etc.
Example to create for **products**, **customers**, **suppliers**, **orders**, employees**, order details, categories**, among others.
Students should submit E-R diagrams using the above tables.

Exercise 2: Installation & DDL

Installation of My sql and practicing DDL commands.

Creating databases, how to create tables, altering the database or tables, dropping tables and databases if not required. You will also try truncate, rename commands etc.
Data Definition Language (DDL): create, alter, drop.

Exercise 3: DML

Data Manipulation Language Commands (DML) commands are used to for managing data within schema objects. Exercising the commands using **DML:** insert, delete, update on the following tables : products, customers, suppliers, orders, , employees, order details, categories.

- INSERT – insert data into a table.
- UPDATE – updates existing data within a table.
- DELETE – deletes single or all records from a table. Data Query Language –Select Populate all the tables designed in experiment: 2 with appropriate data.

Exercise 4: Querying

Practice queries on **Aggregate functions** like count, max, min, avg, sum Practice queries like nested queries/co- related queries using ANY, ALL, IN, Exists, NOT EXISTS, UNION, INTERSECT, group by, having etc. **Joins:** Join, Left Outer Join, Right Outer Join, Self-Join

Exercise 5: Querying (continued…)

Some examples to practice the queries:

1. Display all the order details of given a customer.3
2. Display all the products.
3. Get the highest sold product from given supplier ID
4. List all products grouped by category
5. List the products, whose products unit price is greater then all the products of average.
6. List Details of order and customer of each order
7. List the products which were sold in year 1997
8. Display the total amount for each order
9. Display Order Details for given an order ID

Order Details: product name and unit price for given order ID Exercising Simple to complex Queries using joins, nested and co-related queries.

Exercise 6: Stored Procedures:

Create a stored procedure, Alter and Drop a procedure, IN, OUT, IN & OUT parameters.

1. Create a Procedure to display order details of given customer ID like ordered, order Date, Required Date, Shipped Date.
2. Create a procedure to accept a customer ID and display the customer order history (product name and how much quantity ordered for that particular product).
3. Ex: product name, Total quantity he/she ordered.
4. Create a procedure to display Ten Most Expensive Products Columns should be displayed Product name & Unit price.

Exercise 7: Views

1. Create a view to display the current product list which are available (not discontinued).
2. Create a view to display the products by category.
3. Display product name, quantity Per Unit, units In Stock, Discontinued.
4. Create a view ―Invoices ‖to display all the information from order, customer, shipper for each
5. Order Details.

Exercise 8: Triggers

Demonstrate Create Trigger, Alter Trigger, Drop Trigger, Row Level, Table Level triggers, Before Insert, After Insert, Before Update, After Update, Before Delete, After Delete

Exercise 9:

Demonstrate the role of DBA using DCL commands.

TEXT BOOKS:

1. Database Management Systems- Raghurama Krishnan, Johannes Gehrke, Tata McGraw Hill, 3rd Edition, 2008.
2. Database System Concepts- Silberschatz, Korth, McGraw Hill, 5th Edition, 2005.

REFERENCE BOOKS:

1. Database Systems design, Implementation and Management - PeterRob & Carlos Coronel, 7th Edition, Cengage Learning, 2006.
2. Fundamentals of Database Systems - Elmasri Navrate, Pearson Education, 2016.
3. Introduction to Database Systems - C.J.Date, Pearson Education, 2004.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

II Year I Semester Syllabus (KR23)

OBJECT ORIENTED PROGRAMMING THROUGH JAVA LAB (23CC307PC)

Common for CSE, CSE (DATA SCIENCE) & CSE (AI & ML)

L	T	P	C
0	0	2	1

Prerequisites/ Corequisites:

1. 23CS103ES - Programming for Problem Solving Course

Course Objectives: The course will help to

1. Develop programs using concepts of OOPs such as data abstraction, inheritance, polymorphism and encapsulation.
2. Design programs for implement I/O Streams
3. Write multithreaded and Exception handling programs.
4. Solve real world problems using java collection frame work.
5. Impart hands on experience with jdbc programming.

Course Outcomes: The student will be able to

1. Outline the concepts of OOPs in structuring computer applications for solving problems.
2. Design programs using I/O streams to read and write files.
3. Utilize the concepts of exception handling and multithreading in a given real time problems.
4. Choose appropriate collections to solve programming problems.
5. Develop java applications by using JDBC.

List of Exercises:

1.

a) Write a java program to check if the number (N) can be written as the form (k+1)*k. Write a java program to print those numbers in the given range.

b) Write a java program to check whether the given number is gapful or not.

A number is gapful if it is at least 3 digits long and is divisible by the number formed by stringing the first and last numbers together. The smallest number that fits this description is 100. First digit is 1, last digit is 0, forming 10, which is a factor of 100. Therefore, 100 is gapful.

c) Cricketer's Pension Continuing our journey in mastering the conditional statements & our interest with cricket. Let us help the Indian cricket's governing body (BCCI) to automate its plan of allotting pensions to former players. Therules are given below:

- If a player has played more than 10 test matches and 100 ODI's he receives Rs.50,000. If a player has played morethan 10 test matches, he receives Rs.25,000.
- If a player has played more than 100 ODI's he receives Rs.15,000. If a player has played for India he receives Rs.10000. The amount is incremented by 1/4th for every 'man of the match' award.
- If a player has not played for India but played IPL he receives an amount of Rs.8000. If a player has not played forIndia nor IPL he receives an amount of Rs.7000.

2. A resistor is a circuit device designed to provide a specific resistance between its two ends. Resistance is expressed in ohms (Ω) or kilo-ohms (kΩ). Resistors are usually marked with colored bands that encode their resistance, as shown in figure-1 below. The first two bands represent digits and the third is a power-of-ten multiplier.

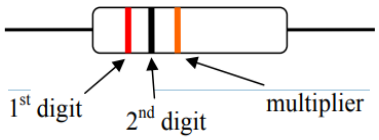


Figure 1: Colour Bands of a resistor

The table below shows the number value of each band color. For example, if the first digit is red (represents 2), the second is digit is black (represents 0), and the third digit is orange represented as multiplier (represents 3), the resistance is 20×10^3 Ω or 20 kΩ.

Color	NumberValue
Black	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Violet	7
Grey	8
White	9

Write a Resistor class containing the parameterized constructor, which takes in three strings representing the three bandcolors. Write the methods to calculate and set the resistance for the resistor.

3.

a) Write a Java program for given an array **arr[]** of **N** integers, the task is to find the maximum difference between any two elements of the array.

b) Write a Java program to fill the below pattern into a square matrix:

The matrix has to be filled with numbers starting from 1. It has to start fill first row last column, last row (reverse), firstcolumn (reverse) and so on. Please refer the following example

input 5

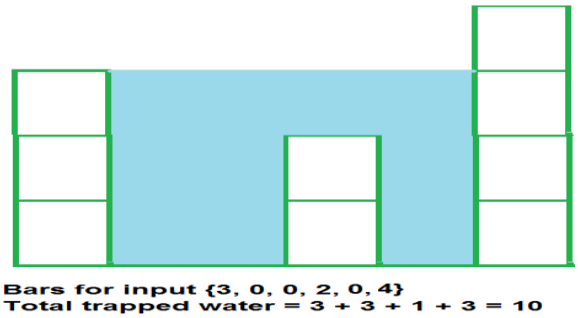
output =

1	**2**	**3**	**4**	**5**
16	17	18	19	6
15	24	25	20	7
14	23	22	21	8
13	12	11	10	9

c) Given n non-negative integers representing an elevation map where the width of each bar is 1, compute howmuch water it is able to trap after raining.

Examples:

Input: arr[] = {3, 0, 0, 2, 0, 4}



Output: 10

We can trap "3*2 units" of water between 3 an 2, "1 unit" on top of bar 2 and "3 units" between 2 and 4.

4.

a) Write a java program for given two strings text1 and text2, return the length of their longest common subsequence. A subsequence of a string is a new string generated from the original string with some characters (can be none) deleted without changing the relative order of the remaining characters. (eg, "ace" is a subsequence of "abcde" while "aec" is not). A common subsequence of two strings is a subsequence that is common to both strings. If there is no common subsequence return 0.

b) Write a java program for given two strings s1 and s2, your task is to merge those strings to form a new merged string. A merge operation ontwo strings is described as follows:

- Append alternating characters from s1 and s2, respectively, to merge String. Once all of the characters in one of the strings have been merged, append the remaining characters in the other string to merged String.

c) Write a Java program for given a string S of alphabet characters and the task is to find its matching decimal representation as on the shown keypad. Output the decimal representation corresponding to the string.

For ex: if you are given—Amazon then its corresponding decimal representation will be 262966.

5. Write a Java program to Define a MyRectangle class with four public data members representing the x- and y-coordinates of the bottom- left vertex and top-right vertex of a rectangle, whose sides are parallel to the x- or y-axis.

For example, the statement new MyRectangle (20, 80, 30, 90) creates a rectangle with bottom-left vertex at position (20, 80), and top-right vertex at (30, 90).

- Write an area () method, which computes the area of a rectangle.
- Write the overlap (MyRectanglerect) method. This method returns a rectangle which is the overlapped region of two rectangles. In the event that there is no overlap, it should return a rectangle with both bottom-left vertex and top-right vertex at position (0,0).
- Using the overlap (MyRectanglerect) method written above, write the overlapAll(MyRectangle [] rectangles) method which returns the overlapped region of all the rectangles in the array. You may assume that there is atleast one element in the array. Your method should be efficient in that the moment it finds that the overlapped region is empty, it should return a rectangle with both vertices at (0,0) immediately.
- Write MySqaure.java, MySquare extends MyRectangle. A square is defined by its bottom-left vertex and thelength of its side. Complete the super (. . .) statement in the constructor.

Below is output of MySquare.java program when the user enters: 10 305.

- Override toString () method in MyRectangle in order to get such output.

6.

a) Write a java program that loads names and phone numbers from the text file into Hash Table where data is organized as one line per record and each field in record are separated by a tab(\t). It takes a name or phonenumber as input and prints the corresponding other value from hash table.

b) Write a java program for the following scenario you have created a web-based survey of favorite programming languages and are capturing the results into a text file named logfile. The structure of the text file is:

Total # Entries Vote for Entry 1
IP Address for Entry 1 Timestamp in seconds for Entry 1Vote for Entry 2
IP Address for Entry 2 Timestamp in seconds for Entry 2
….
For example, here is a sample log file of six entries:

6
PHP 137.229.156.12
1000002
C# 137.229.156.18
1000005
PHP 137.229.156.12
1000006
Prolog 156.213.38.31
1000010
PHP 128.120.56.214
1000020
PHP 137.229.156.12
1000022

- The logfile is ordered by increasing timestamp. You are concerned that some people are voting multiple times for thesame item. To somewhat address this problem, throw out any new votes for the same item that come from the same IP address within 20seconds.
- In the above example, the second and last votes for PHP would be thrown out because they are for the same item fromthe same IP address and occur within 20 seconds of other PHP votes from the same IP address. However, the PHP vote from 128.120.56.214 would be retained since there is not another PHP vote from this IP address.
- Write a Java program to count the votes from the logfile, throwing out duplicate votes using the rules above.

Display the votes in a table, as shown below for the example:

PHP 2
C# 1
Prolog 1

7.

a) Write a Java Class to implement a method Addition () that returns a new Array where each array element at the indexk corresponds to the sum of elements of the array (src) starting at index 0 and including element at the index _k '. For example, for array [2, 3, 5], the method will return array [2, 5, 10]. For an array of size '0'or a null parameter, the methodwill throw exception Illegal Argument Exception With the message —Invalid Argument.

b) Write a Java program to implement a multithreaded version of FizzBuzz with four threads.If the number is divisible by 3, output "fizz".

If the number is divisible by 5, output "buzz".
If the number is divisible by both 3 and 5, output "fizzbuzz". If the number is not divisible by both 3 and 5 print the number.

For instance if n is 15, we will have the output as — 1, 2, fizz, 4, buzz, fizz, 7, 8, fizz, buzz, 11, fizz, 13, 14, fizzbuzz

1. Thread A will call fizz () to check for divisibility of 3 and outputs fizz.
2. Thread B will call buzz () to check for divisibility of 5 and outputs buzz.
3. Thread C will call fizzbuzz () to check for divisibility of 3 and 5 and outputs fizzbuzz.
4. Thread D will call number () which should only output the numbers.

8.

a) Write a java program to store the employee details in an ArrayList and display the employee details in ascending order of their experience. Create 'Employee' class with two instance variables Employee name and Employee experience (no. of years).

b) Write a java program to find the most common words in the list of words given in sorted order based on occurrence from largest to smallest. If any of words are having same occurrence then consider the smallest character order comes first.

Input format: First line contains the list of words and next line contains a number (k) which represent the top most words to display. Output format: display the k top most words.

9.

a) Write a java Program to write a method fCount which takes a string as a parameter. The Method fCount should return the Map which has the frequency count of the given word. For example, if the string passed is—" hello", the map should return {h- 1, e-1, l-2, o-1}. The order of the characters should be same as in the string.

b) When working with HashMaps, sometimes cases arise where we wish to determine if two HashMaps have any key-value pairs in common. For example, we might have the following two Hashmaps (named hashmap1 and hashmap2, respectively) that map from String to String (i.e., their type is HashMap) and we want to count how many key-value pairs they have in common.

Hashmap1

Key	Value
Alice	Healthy
Mary	Ecstatic
Bob	Happy
Chuck	Fine
Felix	Sick

Hashmap2

Key	Value
Mary	Ecstatic
Felix	Healthy
Ricardo	Superb
Tam	Fine
Bob	Happy

In the example above, these two HashMaps have two key-value pairs in common, namely: "Mary"-"Ecstatic" and "Bob"-"Happy". Note that although the key "Felix" is in both HashMaps, the associated value with this key is different in the two maps (hence this does not count as a key-value pair that is common to both HashMaps). Similarly, just having the same value without the same key (such as the value "Fine" which is mapped to by different keys in the two different HashMaps) would also not count as a common key-value pair between the two HashMaps. Your job is to write a method:

public int common key value price (HashMap<String,string> map1, HashMap <String,string> map2).

That is passed two objects of type HashMap<string, string> and returns the number of common key/value pairsbetween the two HashMaps.

10.

a) Write a java program to demonstrate a JDBC Program on Employee Schema given below

- Read a department number from the user and display those employee names in ascending order who areworking in the department.
- Note - Display records based on employee names in ascending order
- The DB Credentials Name of the DB –test; Name of the table- emp;
- JDBC_DRIVER = "com.mysql.jdbc.Driver"; DB_URL = jdbc:mysql://localhost/test";
- Username- student Password-studentemp schema;

Field	Type	Null	Key	Default	Extra
empno	int (4)	NO	PRI	NULL	
ename	varchar (50)	NO		NULL	
job	varchar (50)	NO		NULL	
mgr	int (4)	YES		NULL	
hiredate	date	YES		NULL	
sal	decimal (10,2)	YES		NULL	
comm	decimal (10,2)	YES		NULL	
deptno	int (2)	YES	MUL	NULL	

b) Write a java program to demonstrate a JDBC program to display all the employee names in ascending order who are working in "Dallas"location using createStatement (). Schema Given below emp schema;

c) Demonstrate JDBC program to read three values (dno, dname, dloc) from the user and insert those recordsinto the dept table using Prepared Statement
The Reading of input should be first deptno followed by deptname followed by deptlocation
Dept Schema

Field	Type	Null	Key	Default	Extra
deptno	int (2)	NO	PRI	NULL	
dname	varchar (50)	NO		NULL	
location	varchar (50)	NO		NULL	

TEXT BOOKS:

1. Java: The Complete Reference, Herbert Schildt Twelfth Edition Mc Graw Hill Education (India)Pvt. Ltd, 2021.
2. Java Database Best Practices- George Reese, O'Reilly Media, 2003.

REFERENCE BOOKS:

1. Introduction to Java programming - Y. Daniel Liang, Pearson Education, 2012.
2. Object Oriented Programming with Java: Essentials and Applications R.Buyya, ST.Selvi,X.Chu TMH 2009
3. An Introduction to programming and OO design using Java-J.Nino and F.A. Hosch, John Wiley & sons, 2008.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING
B.Tech. II Year I Semester Course Syllabus (KR23)
SKILL DEVELOPMENT COURSE 1 (Node JS) (23CS308PC)
Common for CSE, CSE (DATA SCIENCE), CSE (AI & ML), IT

L	T	P	C
0	0	4	2

Prerequisite/ Corequisite:

1. 23CS210ES – Elements of Computer Science and Engineering Course

Course Objectives: The course will help to

1. To implement the static web pages using HTML.
2. To gain knowledge on CSS3.
3. To experiment with Bootsrap5 framework.
4. To explore with DOM manipulations using JavaScript.
5. To explore advanced JavaScript using ES6.

Course Outcomes: The student will able to

1. Build a custom website with HTML
2. Use CSS on the website.
3. Use Bootstrap5 for creating responsive website.
4. Perform DOM manipulations using JavaScript.
5. Demonstrate Advanced features of JavaScript.

List of Exercises:

1. Build a responsive web application for shopping cart with registration, login, catalog and cart pages using CSS3 features, flex and grid.
2. Make the above web application responsive web application using Bootstrap framework.
3. Using JavaScript and HTML build a simple calculator, apply necessary CSS to it.
4. Using JavaScript read from a JSON object and display the data in a table (HTML page).
5. Explore the features of ES6 like arrow functions, callbacks, promises, async/await. Build an application for reading the weather information from openweathermap.org and display the information on the web page and apply necessary CSS/Bootstrap.
6. Deploy the project.

TEXT BOOKS:

1. Web Programming with Html, CSS, Bootstrap, Javascript, Jquery, Php, and Mysql, Larry Sanchez, 2017.
2. CSS Pocket Reference, 5th Edition by Eric Meyer by O'Reilly Media, Inc., 2018.
3. Bootstrap 5 Foundations by Daniel Charles Foreman, Independently published, 2021.
4. Understanding ECMAScript 6: The Definitive Guide for JavaScript Developers 1st Edition, Nicholas C. Zakas, No Starch Press, 2016.

REFERENCE BOOKS:

1. HTML, CSS and JavaScript All in One, Sams Teach Yourself: Covering HTML5, CSS3, and jQuery – Softcover, Sams Publishing 2018
2. The Missing Bootstrap 5 Guide By Jeppe Schaumburg Jensen, Packt Publishing Limited, 2022
3. Simply ES6, Mastering JavaScript and ES6 to its fullest, 2nd Edition, by Ray Voice and Anna Voice, Independently published, 2020

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year I Semester Course Syllabus (KR23)

GENDER SENSITIZATION LAB (*23MC309HS)

Common for CSE, CSE (DATA SCIENCE), CSE (AI & ML), IT

L	T	P	C
0	0	2	0

COURSE DESCRIPTION:

This course offers an introduction to Gender Studies, an interdisciplinary field that asks critical questions about the meanings of sex and gender in society. The primary goal of this course is to familiarize students with key issues, questions and debates in Gender Studies, both historical and contemporary. It draws on multiple disciplines – such as literature, history, economics, psychology, sociology, philosophy, political science, anthropology and media studies – to examine cultural assumptions about sex, gender, and sexuality.

This course integrates analysis of current events through student presentations, aiming to increase awareness of contemporary and historical experiences of women, and of the multiple ways that sex and gender interact with race, class, caste, nationality and other social identities. This course also seeks to build an understanding and initiate and strengthen programmes combating gender-based violence and discrimination. The course also features several exercises and reflective activities designed to examine the concepts of gender, gender-based violence, sexuality, and rights. It will further explore the impact of gender-based violence on education, health and development.

Prerequisite/Corequisite:NIL

Course Objectives: The course will help to

1. To develop students' sensibility with regard to issues of gender in contemporary India.
2. To provide a critical perspective on the socialization of men and women.
3. To introduce students to information about some key biological aspects of genders.
4. To expose the students to debates on the politics and economics of work.
5. To help students reflect critically on gender violence.

Course Outcomes: The student will able to

1. Students will have developed a better understanding of important issues related to gender in contemporary India.
2. Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
3. Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
4. Students will acquire insight into the gendered division of labour and its relation to politics and economics.
5. Men and women students and professionals will be better equipped to work and live together as equals.

Unit-I:

UNDERSTANDING GENDER: Introduction: Definition of Gender-Basic Gender Concepts and Terminology-Exploring Attitudes towards Gender-Construction of Gender-Socialization: Making Women, Making Men - Preparing for Womanhood. Growing up Male. First lessons in Caste.

Unit – II:

GENDER ROLES AND RELATIONS: Two or Many? -Struggles with Discrimination-Gender Roles and Relations-Types of Gender Roles- Gender Roles and Relationships Matrix-Missing Women-Sex Selection and Its Consequences- Declining Sex Ratio. Demographic Consequences-Gender Spectrum: Beyond the Binary

Unit – III:

GENDER AND LABOUR: Division and Valuation of Labour-Housework: The Invisible Labor- "My Mother doesn't Work." "Share the Load."-Work: Its Politics and Economics -Fact and Fiction. Unrecognized and Unaccounted work. -Gender Development Issues-Gender, Governance and Sustainable Development-Gender and Human Rights-Gender and Mainstreaming

Unit – IV:

GENDER - BASED VIOLENCE: The Concept of Violence- Types of Gender-based Violence-Gender-based Violence from a Human Rights Perspective-Sexual Harassment: Say No!-Sexual Harassment, not Eve-teasing-Coping with Everyday Harassment- Further Reading: "*Chupulu".* Domestic Violence: Speaking OutIs Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Thinking about Sexual Violence Blaming the Victim-"I Fought for my Life…."

Unit – V:

GENDER AND CULTURE: Gender and Film-Gender and Electronic Media-Gender and Advertisement-Gender and Popular Literature- Gender Development Issues-Gender Issues-Gender Sensitive Language-Gender and Popular Literature - Just Relationships: Being Together as Equals Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Rosa Parks- The Brave Heart.

Note: **Since it is Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering departments.**

Classes will consist of a combination of activities: dialogue-based lectures, discussions, collaborative learning activities, group work and in-class assignments.

Apart from the above prescribed book, Teachers can make use of any authentic materials related to the topics given in the syllabus on "Gender".

TEXT BOOKS:

The Textbook, "*Towards a World of Equals: A Bilingual Textbook on Gender"* written by A.Suneetha, Uma Bhrugubanda, DuggiralaVasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu **published by Telugu Akademi, Telangana Government in 2015.**

ASSESSMENT AND GRADING:

- Discussion & Classroom Participation: 20%
- Project/Assignment: 30%
- End Term Exam: 50%

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B. Tech II Year II Semester Syllabus (KR23)

AUTOMATA THEORY AND COMPILER DESIGN (23CC401PC)

Common to CSE, CSE (DS), IT, CSE(AI&ML)

Prerequisites / Corequisites:

L	T	P	C
3	0	0	3

1. 23CC304PC – Discrete Mathematics Course

Course Objectives: The course will help to

1. Provide introduction about central ideas of theoretical computer science from perspective of formal languages.
2. Introduce fundamental concepts of Formal languages, grammars, and types of automata.
3. Introduce the major concepts of language translation and compiler design.
4. Impart the knowledge of practical skills for constructing a compiler.
5. Introduce various phases of compiler with examples.

Course Outcomes: The student will be able to

1. Identify and understand the concept of abstract machines and their power to recognize the languages.
2. Explore context free grammar for formal languages.
3. Design a compiler on given a set of language features.
4. Implement LL and LR parsers.
5. Design and develop machine code from three address code.

UNIT-I

Introduction to finite automata: The central concepts of automata theory, Structural representation of FA, Typesof FA, Conversion of NFA to DFA and NFA with epsilon to NFA without epsilon.

Regular Expression: Introduction to Regular language and Regular Expression, Algebraic laws for regular expressions, Conversion of FA to RE and RE to FA, Pumping lemma for Regular languages.

UNIT-II

Grammar: Definition of Grammar, Types of grammars, Derivation, derivation types, Derivation tree, Ambiguity, Left recursion and Elimination of Left recursion.

Push Down Automata (PDA): Definition, Structural representation, Construction of PDA, conversion of PDA – CFG and CFG to PDA.

UNIT-III

Turing Machine (TM): Definition, Structural representation, Construction of Turing Machine on various languages.

Compiler: General Language processing system, Definition of Compiler, Phases of Compiler, Lexical Analysis, Input Buffering.

UNIT-IV

Syntax Analysis: Introduction to types of Parsing techniques, Top-down Parsing: Recursive Decent parsing, Predictive parsing, Bottom-up Parsing: SLR, CLR, LALR.

Semantic Analysis: Introduction to Syntax Directed Definition, Syntax Directed Translation, Attributes, Types of Attributes, Bottom-up evaluation of attributes.

Intermediate code generation: Types of Intermediate codes, Types of Three address codes, Evaluation of three address code.

UNIT-V

Runtime Environment: Storages organization, Storage allocation strategies: Static, Stack, Heap allocations, Activation Record.

Code Optimization: Introduction, principle sources of optimization, flowgraph, techniques in local loop and global optimizations.

Code generation: Issues in code generation, DAG, Simple code generator.

TEXT BOOKS:

1. Compilers: Principles, Techniques and Tools – Alfred V. Aho, Monica S.Lam, Ravi Sethi, Jeffry D. Ullman, 2nd Edition, Pearson, 2007.
2. IntroductiontoTheoryofComputation - AnilMaheshwari, MichielSmid, April17,2019.
3. Compiler Construction – Principles and Practice, Kenneth.

REFERENCE BOOKS:

1. Modern compiler implementation in C – Andrew WAppel, Revised Edition, Cambridge University Press.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year II Semester Course Syllabus (KR23)

DATA STRUCTURES (23CC402PC)

Common for CSE, CSE (DATA SCIENCE), CSE (AI&ML), IT

L	T	P	C
3	0	0	3

Prerequisite/Corequisite: NIL

Course Objectives: The course will help to

1. Learn the syntax and semantics of the C++ programming language.
2. Implement ADTs such as lists, stacks, queues, trees, graphs, search trees in C++ to solve problems.
3. Choose an appropriate data structure for a specified application.
4. Understand the behaviour of data structures such as trees, hash tables, search trees, Graphs and their representations.
5. Understand and analyze various searching and sorting algorithms.

Course Outcomes: The student will be able to

1. Understand C++ Program structure, functions, and templates.
2. Differentiate types of recursions, array and dynamic array and linear and non-linear data structures.
3. Construct programs using a variety of data structures such as stacks, queues, hash tables, binary trees, search trees, heaps, graphs.
4. Interpret appropriate data structures to represent data items in real world problems.
5. Design and implement sorting and searching algorithms, their implementation, efficiency, and practical application. They wil be equipped to choose the most suitable algorithm for specific tasks and analyze the performance.

UNIT – I:

Basic Concepts of C++ - Structure of a C++ program, Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions.

Flow control statement- if, switch, while, for, do, break, continue, goto statements. Functions - Scope of variables, Parameter passing, Default arguments.

Templates - Types of templates, Class - definition, structure, objects, access modifiers, scope, this pointer, Constructors and Destructors, inheritance, virtual functions.

UNIT – II:

Recursion, Arrays: Recursion, Direct Recursion, Indirect Recursion, Data Abstraction, Representation of single, two-dimensional arrays, row order majoring, column order majoring, Dynamic Array- polynomials, sparse matrices-array and linked representations, Dynamic Array vs Array.

Introduction to Linear data structures-Linear list ADT-array representation and linked representation, Types of Linked List - Singly Linked Lists-Operations-Insertion, Deletion, Doubly Linked Lists- Operations-Insertion, Deletion, Real Time Applications of Linked List.

UNIT- III:

Stacks: Definition, ADT, standard stack operations- array and linked list implementations, applications-infix to postfix conversion, postfix expression evaluation, parsing parentheses, reverse of a string using stack.

Queues: Definition, ADT**,** standard queue operations - array and linked implementations, Circular queues - Insertion and deletion operations.

UNIT IV:

Non-Linear Data Structures: Trees – Definition, terminology, Binary trees-definition, Properties of Binary Trees, Binary Tree ADT, representation of Binary Trees - array and linked representations, Binary Tree traversals- DFS-In-order, Post-order, Preorder, BFS – Level order traversal, Binary Search Tree ADT – BST traversal

UNIT V:

Graphs–Definitions**,** Terminology, Applications and more definitions, Properties, Graph ADT, Graph Representations- Adjacency matrix, Adjacency lists, Graph Search methods - DFS and BFS.

Sorting- Merge Sort, Heap sort, **Priority Queues–**Definition and applications, Max Heap, Min Heap.

Hashing-Definition, hash tables, hash functions, Collision resolution techniques - linear probing, chaining.

TEXTBOOKS:

1. Data Structures Through C++ - Yashavant Kanetkar, 4th Edition, BPB Publications, 2022.
2. Data structures using C++- D. S. Malik, 2nd Edition, Cengage learning, 2009.
3. The Complete Reference C++- Herbert Schildt, 4th Edition, Tata Mc Graw Hill, 2017.

REFERENCE BOOKS:

1. Data Structures and Algorithm Analysis in C++, 4th Edition, Weiss Mark Allen, Pearson Education · 2014
2. The C++ Programming Language, 4th Edition, B. Stroutstrup, Pearson Education, 2013.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year II Semester Course Syllabus (KR23)

OPERATING SYSTEMS (23CC403PC)

Common for CSE, CSE (DATA SCIENCE), CSE (AI & ML), IT

L	T	P	C
3	0	0	3

Prerequisites/ Corequisites

1. 23CS103ES - Programming for Problem Solving Course
2. 23CC405PC – Computer Organization and Architecture

Course Objectives: The course will help to

1. Understand the design and the services provided by an operating system.
2. Learn different process scheduling algorithms and process synchronization.
3. Facilitate students in understanding Inter process communication along with deadlocks.
4. Categorize the operating systems' resource management techniques, file and memory management techniques.
5. Impart fundamentals of Disk Management and Protection.

Course Outcomes: The student will be able to

1. Understand the basic concepts of Operating Systems and Linux Utility system calls.
2. Illustrate the different process scheduling algorithms and the challenges in process synchronization.
3. Demonstrate Inter process communication and deadlock.
4. Explore memory management techniques and file management concepts.
5. Analyze disk management and the importance of protection.

UNIT-I

Introduction to Operating System – Operating system objectives, User view, System view, Operating system definition, OS Operations, Operating System services, OS Structures- Simple, Layered Architecture, Micro Kernel, Modular, Hybrid structure.

Introduction to Linux and Linux Commands - Architecture of LINUX, features of LINUX. Introduction to various LINUX commands such as PATH, man, echo, printf, script, passwd, uname, who, date, pwd, cd, ls, cd, touch, mv, rm, man, mkdir, rmdir, tar, gzip, cat.

UNIT-II

Process and CPU Scheduling - Process concepts and scheduling, Operations on processes, Introduction to threads: Types and issues, Scheduling Criteria, Scheduling Algorithms: FCFS, SJF, SRTF Priority Non-Preemption, Priority Preemption, Round Robin.

System call interface for process management - fork, vfork, exit, wait, waitpid, exec.

Process Management and Synchronization - The Race condition, The Critical Section Problem, Synchronization Hardware, Semaphores and Classical Problems of Synchronization, Critical Regions, Monitors.

UNIT-III

Inter Process Communication Mechanisms - IPC using pipes, FIFOs, Semaphores: semget, semop, semctl, message queues: msgget, msgsnd, msgrcv, msgctl, shared memory: shmget, shmat, shmdt, shmctl, ipc status commands.

Deadlocks - System Model, Deadlocks Characterization, Methods for Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection and Recovery from Deadlock.

UNIT-IV

Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Demand Paging, Page Replacement, Page Replacement Algorithms: FIFO, LRU, Optimal.

Protection – System Protection, Goals of Protection, Principles of Protection.

Domain of Protection: Access Matrix, Implementation of Access Matrix.

UNIT-V

File System Interface and Operations – Access methods: Direct Access, Sequential Access, Index Sequential Access, Directory Structure, Protection, File System Structure, **Allocation methods:** Contiguous Allocation, Linked Allocation, Indexed Allocation, Free-space Management.

System calls for File Management - create, open, close, read, write, lseek, link, symlink, unlink, stat, fstat, lstat, chmod, chown, **Directory System calls -** opendir, readdir, closedir, mkdir, rmdir, umask.

TEXT BOOKS:

1. Operating System Principles - Abraham Silberchatz, Peter B. Galvin, Greg Gagne, JohnWiley, 9th Edition,2013.
2. Advanced Programming in the UNIX Environment - W. Richard. Stevens, 3rd Edition, Pearson Education, New Delhi, India. 2013

REFERENCE BOOKS:

1. Operating Systems - Internals and Design Principles - William Stallings, Operating Systems, 7 th Edition, Pearson education PHI, 2013.
2. Modern Operating Systems – Andrew S. Tanenbaum, Fourth Edition, Pearson/PHI 2009
3. Unix and shell Programming - Behrouz A. Forouzan, Richard F.Gilberg. Thomson, Cengage Learning.
4. UNIX Programming Environment - Kernighan and Pike, PHI/ Pearson Education.2015.

KESHAV MEMORIAL INSTITUTE OF TECHNOLOGY

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B. Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year II Semester Course Syllabus (KR23)

MACHINE LEARNING (23CC404PC)

Common for CSE, IT

L	T	P	C
3	0	0	3

Prerequisites/Corequisites:

1. 23CS203ES – Python Programming Course

Course Objectives: The course will help to

1. Introduce basic concepts of Machine Learning.
2. Introduce Descriptive Statistics and data analysis along with visualization.
3. Gain knowledge on Regression analysis.
4. Gain knowledge on Classification Algorithms.
5. Introduce Unsupervised Learning Algorithms.

Course Outcomes: The student will be able to

1. Understand the basic concepts of Machine Learning.
2. Develop the Statistics and data analysis along with visualization.
3. Implement the different types of regression models.
4. Implement the classification model for categorical data.
5. Analyze and develop unsupervised Algorithms.

UNIT–I:

Introduction-Artificial Intelligence, Machine Learning, Deep learning and Data Science, Types of Machine Learning Systems: supervised, unsupervised, semi-supervised, Reinforcement, why machine learning, Problems machine learning can solve, Main Challenges of Machine Learning, Essential libraries and tools for machine learning-Jupyter Notebook, NumPy, Pandas, Matplotlib, Scikit Learn.

UNIT–II:

Statistical Learning: Introduction to Data representation, types of data-nominal, ordinal, interval and continuous, central tendency-calculating mean mode median, mean vs median, variability, variance, standard deviation, Mean Absolute Deviation using sample dataset, finding the percentile, inter quartile range, Box Plot, Outlier, whisker, calculating correlation, covariance, causation.

Data Pre-processing- Exploratory data analysis, Data preparation and preprocessing, visualization and its tools.

UNIT– III:

Supervised Learning-Regression: Introduction to Regression analysis, measure of linear relationship, Regression with stats models, determining coefficient, meaning and significance of coefficients, Types of regression, Simple Linear Regression, Using Multiple features, Polynomial Regression, Metrics for Regression: MSE, RMSE, MAE. Generalization, Overfitting and Underfitting.

UNIT–IV:

Supervised Learning-Classification: Classification problem, Probability based approach, Logistic Regression-log-odd, sigmoid transformation, Metrics: Confusion Matrix, Accuracy, Error Rate, Precision, Recall, ROC curve, F1 score, and introduction to gradient descent, Classification Algorithms-KNN, DecisionTrees, Naïve bayes Classifier, Random Forest, Support Vector machines.

UNIT– V:

Unsupervised Learning Techniques-Clustering, K-means, Limits of K-means, using clustering for image Segmentation, using clustering for Preprocessing, Using clustering for semi supervised learning.

Dimensionality Reduction: The Curse of Dimensionality, Main Approaches for Dimensionality Reduction, PCA.

TEXTBOOKS:

1. Introduction to Machine Learning with Python-Andreas C.Miller& Sarah Guido, O'Reilly, 2016
2. Hands-OnMachineLearningwithScikit-LearnandTensorFlow-AurélienGéron,O'ReillyMedia,2017.
3. PracticalPythonDataVisualization:A Fast Track Approach to Learning Data Visualization WithPython, Ashwin Pajankar, APress, 2022.

REFERENCEBOOKS:

1. Machine Learning in Action, Peter Harrington,Manning Publications, 2012.
2. Python for Data Analysis– McKinny,2nd Edition,O'REILLY Publications, 2017.

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B. Tech in COMPUTER SCIENCE AND ENGINEERINGB.Tech. II Year II Semester

Course Syllabus (KR23)

COMPUTER ORGANIZATION AND ARCHITECTURE (23CC405PC)

Common for CSE, CSE (DATA SCIENCE)

L	T	P	C
3	0	0	3

Prerequisite/ Corequisite:

1. 23CC301ES –Digital Electronics course.

Course Objectives: The course will help to

1. Understand the basic components of a computer.
2. Understand the various addressing modes, instruction sets, and instruction formats.
3. Understand and manipulate numbers stored in a digital computer.
4. Explore the Memory organization and I/O Organization.
5. Understand the concept of pipelining techniques.

Course Outcomes: **The student will be able to**

1. Understand the basics of instructions sets and their impact on processor design.
2. Demonstrate an understanding of the design of the functional units of a digital computer system.
3. Recognize and manipulate representation of numbers stored in digital computers.
4. Evaluate cost performance and design trade-offs in designing and constructing a computerprocessorincluding memory.
5. Design a pipeline for consistent execution of instructions with minimum hazards.

Unit-I:

Digital Computers: Introduction, block diagram of digital computer, definition of computer organization and architecture.

Basic Computer Organization and Design: Common Bus system, Bus and memory transfer, Computer Registers, Instruction codes, Computer instructions: Memory Reference Instructions, Register reference instructions, Input – Output instructions, Timing and Control, Instructioncycle, Interrupt cycle.

Unit-II:

Instruction Set Architecture: General Register Organization, Instruction Formats: Types of Instruction formats with an example, Addressing modes: Types of addressing modes with an example, Data Transfer Instructions ,Data Manipulation instructions, Program Control Instructions.

Unit-III:

Data Representation: Data types, Complements, Fixed Point Representation, Floating Point Representation.

Introduction to Computer Arithmetic: Addition, subtraction, multiplication, Division Algorithms, Floating –point Arithmetic operations

Unit-IV

Memory Architecture: Memory Hierarchy-Main Memory, Auxiliary memory, Associate Memory, Cache MemoryandMapping: Associate mapping, Direct mapping, Set Associate mapping.

Input-Output Organization: Input-Output Interface, Asynchronous data transfer, Modes of Transfer, Priority Interrupt Direct memory Access.

Unit-V

Overview of Pipelining Techniques & Processor Architecture: Parallel Processing, Pipelining, Arithmetic Pipeline, Instruction Pipeline, RISC Pipeline, Design Issues, Hazards: Structural Hazards, Data Hazards and Control Hazards, Static Branch Prediction, Dynamic Branch Prediction, Processor Architecture- CISC Characteristics, RISC Characteristics, Differences between CISC and RISC Characteristics, its advantages, disadvantages of CISC over RISC.

TEXT BOOKS:

1. M. Morris Mano, "Computer System Architecture" , 3rd Edition, Pearson, 2017
2. Jason Sanders & Edward Kandrot, "CUDA by Example: Introduction to General-PurposeGPUProgramming", 1st Edition, Addison-Wesley 2010.

REFERENCES:

1. Carl Hamacher, Zvonko Vranesic, Safwat Zaky: "Computer Organization", 5th Edition, TMH, 2002.
2. Shane Cook, "CUDA Programming: A Developer's Guide to Parallel Computing with GPUs" 1st Edition,
3. Discrete and Combinatorial Mathematics - 6R. P. Grimaldi, Pearson, 2006.

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B.Tech in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year II Semester Course Syllabus (KR23)

DATA STRUCTURES LAB (23CC406PC)

Common for CSE, CSE (DATA SCIENCE), CSE (AI&ML), IT

L	T	P	C
0	0	2	1

Prerequisites/ Corequisites:

23CS103ES - Programming for Problem Solving Course

Course Objectives: The course will help to

1. Introduce various concepts of C++ programming language.
2. Understand data structures such as stacks and queues.
3. Explore trees and graphs.
4. Introduce searching and sorting algorithms.
5. Implement Data Structures in real world problems.

Course Outcomes: The student will be able to

1. Design and implement C++ programs for computing real life applications.
2. Understand basic elements of control statements, arrays, functions, pointers and strings, and data structures like stacks, queues, and linked lists.
3. Implement searching and sorting algorithms.
4. Select appropriate Data Structure to solve the problems.
5. Test and debug the application.

List of Programs:

1. Write a program to create, insert an element, delete an element, traverse the linked list and find length of a singly linked list.
2. Write a program to create, insert an element, delete an element, traverse a doubly linked list and traverse the doubly linked list in reverse order.
3. Write a program to create, insert an element, delete an element, traverse a circular linked list.
4. Write a program to implement stack operations using arrays and singly linked lists.
5. Write a program to convert an infix expression to postfix expression.
6. Write a program to evaluate a postfix expression.
7. Write a program to check whether an expression is having balanced parenthesis or not.
8. Write a program using stacks to check whether a String is a Palindrome or not.
9. Write a program to implement Queue operations using Arrays and singly linked lists.
10. Write a program to implement Circular Queue operations using Arrays and singly linked lists.
11. Write a program to implement a queue using two stacks.
12. Write a program to check if a queue can be sorted into another queue using a stack
13. Write a program that implements the following sorting methods to sort a given list of integers in ascending order using merge sort and quick sort methods.
14. Write a program that implements Binary tree operations using arrays and doubly linked list.
15. Implement, for a binary tree, the inorder, preorder, postorder and level order traversal methods.
16. Write a program to find the second minimum node in a Binary tree.

17. Write a program to insert a node, delete a node and search for a node in a Binary Search Trees.
18. Write a program to create a graph using arrays and linked lists.
19. Implement the depth first search and breadth first search graph traversal methods.

TEXTBOOKS:

1. Data Structures Through C++ - Yashavant Kanetkar, 4th Edition, BPB Publications, 2022.
2. Data structures using C++- D. S. Malik, 2nd Edition, Cengage learning, 2009.
3. The Complete Reference C++- Herbert Schildt, 4th Edition, Tata Mc Graw Hill, 2017.

REFERENCE BOOKS:

1. Data Structures and Algorithm Analysis in C++, 4th Edition, Weiss Mark Allen, Pearson Education ·2014
2. The C++ Programming Language, 4th Edition, B.Stroutstrup, Pearson Education, 2013.

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B.Tech. in COMPUTER SCIENCE AND ENGINEERING

B.Tech. II Year II Semester Course Syllabus (KR23)
OPERATING SYSTEMS LAB (23CC407PC)
Common to CSE, CSE (DS), CSE (AI & ML), IT

L	T	P	C
0	0	2	1

Prerequisites/ Corequisites: NIL.

Course Objectives: The course will help to

1. Provide an understanding of the design aspects of operating system concepts through simulation.
2. Introduce basic Unix commands, system call interface for process management, Inter process Communication and I/O in Unix.
3. Demonstrate the knowledge of the components of computer and their respective roles in computing.
4. Recognize and resolve user problems with standard operating environments.
5. Gain practical knowledge of how programming languages, operating systems, and architectures interact and how to use each effectively.

Course Outcomes: The student will be able to

1. Illustrate the use of Linux OS, by means of a command line shell.
2. Implement operating system concepts such as scheduling, deadlock management, file management and memory management.
3. Implement C programs using Unix system calls.
4. Demonstrate synchronization and various components of a typical operating system.
5. Analyze various system calls for managing processes, memory and the file system.

List of Exercises

Exercise 1:

Identify the peripherals of a computer, components in a CPU and its functions. Draw the block diagram of the CPU along with the configuration of each peripheral.

a. Disassemble and assemble the PC back to working condition.

b. Install MS windows on the personal computer.

c. Install Linux on the computer. This computer should have windows installed. The system should be configured as dual boot with both windows and Linux.

Exercise 2:

a. Implement in c language the following Unix commands using system calls i) cat ii) ls iii) mv

b. Write a C program to create child process and allow parent process to display “parent” and the child to display “child” on the screen

Exercise 3:

Assume you have the following jobs to execute with one processor, with the jobs arriving in the order listed here:

i	T(pi)
0	80
1	20
2	10
3	20
4	50

with the following values write a program to get the required output which is listed below

a. Suppose a system uses FCFS scheduling. Create a Gantt chart illustrating the execution of these processes?
b. What is the average turnaround time for the processes?
c. What is the average wait time for the processes?

Exercise 4:

a. Write a C program that illustrate communication between two unrelated process using named pipes
b. Write a C program that receives a message from message queue and display them
c. Write a C program to allow cooperating process to lock a resource for exclusive use (using semaphore)
d. Write a C program that illustrate the suspending and resuming process using signal
e. Write a C program that implements producer-Consumer system with two process using semaphore

Exercise 5:

Consider the following snapshot of a system. P0, P1, P2, P3, P4 are the processes and A, B, C, D are the resource types. The values in the table indicates the number of instances of a specific resource (for example: 3 3 2 1 under the last column indicates that there are 3 A-type, 3 B-type, 2 C-type and 1 D-type resources are available after allocating the resources to all five processes). The numbers under allocation-column indicate that those number of resources are allocated to various processes mentioned in the first column. The numbers under Max- column indicate the maximum number of resources required by the processes. For example: in 1st row under allocation- column 2 0 0 1 indicate there are 2 A-type, 0 B-type, 0 C-type and 1 D- type resources are allocated to process P0. Whereas 4 2 1 2 under Max-column indicate that process P0‘s maximum requirement is 4 A- type, 2 B-type, 1 C-type and 2 D-type resources.

Process	Allocation A B C D	Max A B C D	Available A B C D
P0	2 0 0 1	4 2 1 2	3 3 2 1
P1	3 1 2 1	5 2 5 2	
P2	2 1 0 3	2 3 1 6	
P3	1 3 12	1 4 2 4	
P4	1 4 3 2	3 6 6 5	

Answer the following questions using banker’s algorithm by providing all intermediate steps

a. How many instances of resources are present in the system under each type of a resource?
b. Compute the Need matrix for the given snapshot of a system.
c. Verify whether the snapshot of the present system is in a safe state by demonstrating an order in which the processes may complete. If a request from process P1 arrives for (1, 1, 0, 0), can the request be granted immediately?
d. If a request from process P4 arrives for (0, 0, 2, 0), can the request be granted immediately?

Exercise 6:

Write a C program to simulate the following memory management technique: Paging

Exercise 7:

a. Write a C program that takes one or more file/directory names as command line input and reports following information
   File Type ii) Number of Links iii) Time of last Access iv) Read, write and execute permissions.
b. Write a C program to list every file in directory, its inode number and file name

TEXT BOOKS:

1. Operating System Principles - Abraham Silberchatz, Peter B. Galvin, Greg Gagne, 9th Edition, JohnWiley, 2013.
2. Advanced Programming in the UNIX Environment -W. Richard. Stevens, 3rd Edition, Pearson Education, New Delhi, India.2013

REFERENCE BOOKS:

1. Internals and Design Principles - William Stallings, Operating Systems, 5th Edition, Pearson Education/PHI,2013.
2. Unix and shell Programming- Behrouz A. Forouzan, Richard F.Gilberg.Thomson.
3. UNIX Programming Environment, Kernighan and Pike, PHI/ Pearson Education, 2015.

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B. Tech in COMPUTER SCIENCE AND ENGINEERING
B.Tech. II Year II Semester Course Syllabus (KR23)
MACHINE LEARNING LAB (23CC408PC)
Common for CSE, IT

L	T	P	C
0	0	2	1

Prerequisite/ Corequisite:

1. 23CS203ES - Python Programming Course
2. 23CC404PC - Machine Learning Course

Course Objectives: The course will help to

1. Perform exploratory data analysis on the given data sets.
2. Provide hands-on experience with descriptive statistics, data analysis, and visualization.
3. Implement Regression models on given datasets.
4. Build Classification models.
5. Implement models on Unsupervised Learning.

Course Outcomes: The student will be able to

1. Execute the basic concepts of Probability and Machine Learning.
2. Apply the Statistics and data analysis along with visualization.
3. Implement the different types of regression models.
4. Explore the classification model for categorical data.
5. Design and develop the un supervised learning models.

LIST OF EXERCISES

1. Apply central tendency and variability on given dataset
2. Perform EDA on given dataset and prepare dataset to train and test ML model
3. Build a linear regression model using python on given data set by
    a. Prepare the data for ML model
    b. Splitting Training data and Test data.

c. Evaluate the model (intercept and slope).

d. Visualize the training set and testing set using Matplotlib, Seaborn.

e. predicting the test set result

f. compare actual output values with predicted values

4. Apply various regression models on given dataset and find a proper model for prediction with minimal errors.

5. Implement a logistic regression model on given dataset and check the accuracy for test dataset.

6. Build a Decision tree model for given dataset to predict the target with best accuracy.

7. Implement KNN model to classify the target in given dataset.

8. Build SVM model with various kernels and select best kernel for given dataset.

9. Build Random Forest model and apply on given dataset. Evaluate the model with suitable metrics.

10. Implement the K-Means clustering algorithm on a dataset

11. Apply PCA to reduce the dimensionality of a dataset.

TEXT BOOKS:

1. Hands-On Machine Learning with Scikit-Learn and Tensor Flow, Aurélien Géron - O'Reilly Media, 2017.
2. Practical Python Data Visualization: A Fast Track Approach To Learning Data Visualization With Python, Ashwin Pajankar, APress, 2020.
3. Python: End-to-end Data Analysis, Phuong Vo.T.H, Martin Czygan, Ivan Idris, Magnus VilhelmPersson, Luiz Felipe Martins, Packet Pub, 2017

REFERENCE BOOKS:

1. Peter Harrington, Machine Learning in Action, Manning Publications, 2012.

B. Tech. II Year II Semester Course Syllabus (KR23)
CONSTITUTION OF INDIA (*23MC410HS)
Common to CSE, IT, CSE (AI&ML) and CSE (DS)

L	T	P	C
3	0	0	0

Prerequisites/ Co-requisites: Nil

Course Objectives: The course will help to

1. Understand the premises informing the twin themes of liberty and freedom from a civil rights perspective.
2. To address the growth of Indian opinion regarding modern Indian intellectuals' constitutional role and entitlement to civil and economic rights as well as the emergence of nationhood in the early years of Indian nationalism.
3. To address the role of socialism in India after the commencement of the Bolshevik Revolution in 1917 and its impact on the initial drafting of the Indian Constitution.
4. To understand about the functions, powers, qualification and transfer of governance.
5. To understand the importance and role of election commission functions.

Course Outcomes: The student will be able to

1. Discuss the growth of the demand for civil rights in India for the bulk of Indians before the arrival of Gandhi in Indian politics.
2. Discuss the intellectual origins of the framework of argument that informed the conceptualization of social reforms leading to revolution in India.
3. Discuss the circumstances surrounding the foundation of the Congress Socialist Party [CSP] under the leadership of Jawaharlal Nehru and the eventual failure of the proposal of direct elections through adult suffrage in the Indian Constitution
4. Discuss the passage of the Hindu Code Bill of 1956.
5. Explain the functions and responsibility of election commission

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Unit - 1 History of Making of the Indian Constitution- History of Drafting Committee.
Unit - 2 Philosophy of the Indian Constitution- Preamble Salient Features
Unit - 3 Contours of Constitutional Rights & Duties - Fundamental Rights

- Right to Equality
- Right to Freedom
- Right against Exploitation
- Right to Freedom of Religion
- Cultural and Educational Rights
- Right to Constitutional Remedies
- Directive Principles of State Policy
- Fundamental Duties.

Unit - 4 Organs of Governance: Parliament, Composition, Qualifications and Disqualifications, Powers and Functions, Executive, President, Governor, Council of Ministers, Judiciary, Appointment and Transfer of Judges, Qualifications, Powers and Functions.

Unit - 5 Local Administration: District's Administration head: Role and Importance, Municipalities: Introduction, Mayor and role of Elected Representative, CEO of Municipal Corporation. Panchayat raj: Introduction, PRI: Zila Panchayat. Elected officials and their roles, CEO ZilaPanchayat: Position and role. Block level: Organizational Hierarchy (Different departments), Village level: Role of Elected and Appointed officials, Importance of grass root democracy

Unit - 6 Election Commission: Election Commission: Role and Functioning. Chief Election Commissioner and Election Commissioners. State Election Commission: Role and Functioning. Institute and Bodies for the welfare of SC/ST/OBC and women.

TEXT BOOKS:

1. The Constitution of India, 1950 (Bare Act), Government Publication.
2. Dr. S. N. Busi, Dr. B. R. Ambedkar framing of Indian Constitution, 1st Edition, 2015.
3. M. P. Jain, Indian Constitution Law, 7th Edn., Lexis Nexis, 2014.
4. D.D. Basu, Introduction to the Constitution of India, Lexis Nexis, 2015.