Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Engineering Science	
Prerequisite	Advanced Calculus and Linear Algebra	
Course Objective	*To develop a strong foundation in advanced calculus concepts such as successive differentiation and partial differentiation. *To enable students to apply calculus techniques to multivariable functions, including optimization and approximation. *To equip students with essential linear algebra tools for solving systems of equations and analyzing vector spaces.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	0	3	70	30	-	-	100

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Successive differentiation Expansion of functions** Review of Differentiability, Successive differentiation: nth Derivative of xm, nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of ,nth Derivative of , nth Derivative of , nth Derivative of , nth Derivative of .Use of Partial Fraction.Leibnitz theorem for the nth Derivative of the Product of two Functions (Without Proof) Determination of the value of the nth Derivative of a function for x=0	**15**	**25**
2	**Partial derivative** Function of several variables, limits & continuity, partial derivatives of the first order, partial derivatives of higher orders, differentiation of a function of a function, which variable is to be regarded as constant. Euler's theorem on homogeneous functions: homogeneous functions, Euler's theorem on homogeneous functions (without proof), total derivative, and the chain rule: Differentiation of implicit function, partial differentiation of implicit function Jacobians.	**15**	**27**
3	**Application of Partial differentiation** Geometrical Interpretation of partial Derivatives, Tangent plane and Normal line to a surface, Linearization and Linear Approximation, Partial Derivative with constrained variables, Taylor's expansions for functions of two variables, errors and approximations, Maxima and Minima of functions of two variables, working rule to find Maximum and or Minimum Values of a function f(x, y), Lagrange's method of undetermined multipliers.	**15**	**23**
4	**Matrix** Review of matrices, review of determinant, elementary row and column transformation, elementary matrices, to compute the inverse of matrices by elementary transformation (Gauss Elimination), Rank of a matrix, Normal form (Canonical form), Rank of Matrix by Triangular Form, solution of simultaneous equations, consistency of a system of linear equations, homogeneous equations, vectors, linear dependence and independence of vectors, linear dependence and independence of vectors by rank method.	**15**	**25**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	50	20	10	10	5	5

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Student will be able to solve problem based on successive differentiation and Leibnitz rule.
CO2	Student will be able to understand basic concept of partial differential equation.
CO3	Student will be able to understand the application of partial differential equation.
CO4	Student will be able to explain Lagrange's Method of Undetermined Multipliers.
CO5	Student will be able to find the rank of matrix and able to solve system of equations.

Reference Books	
1.	**Higher Engineering Mathematics (TextBook)** By B.V. Ramana, | TMG
2.	**Advance Engineering Mathematics (TextBook)** By R.K. Jain & S.R.K. Iyenger | Narosa Publishing House
3.	**Advanced Engineering Mathematics** By C.Ray Wylie & Louis C. Barrett, | TMG
4.	**Advanced engineering mathematics (TextBook)** By Mishra V P | V P Mishra Publishers, New Delhi 2009

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Basic Computer Hardware & software knowledge | 03060302-T - DIGITAL LOGIC DESIGN	
Course Objective	1. To understand the organization of a computer system in terms of its main components. 2. To understand internal structure and operation of digital computer. 3. To Understand the translation of assembly instructions into their binary representation.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	0	3	70	30	-	-	100

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Digital Logic Circuits, Digital Component and Data Representation** Digital Computers, Logic Gates, Boolean Algebra. Combinational circuits, Flip-flops, Sequential Circuits. Integrated Circuits, Decoders, Multiplexers, Registers, Shift Registers, Binary Counters, Memory units, and Number Systems.	**10**	**15**
2	**Overview of Register Transfer, Micro Operations, Basic Computer Organization and Design** Register Transfer and Register Transfer Language, Bus, and Memory transfer. Arithmetic Micro Operation, Logic Micro Operation, Shift Micro Operation, Arithmetic and Logic Shift Unit. Instruction Codes – Register, Instruction, Time, and Control. Instruction Cycle, Memory Reference Instruction, I/O and Interrupt, Design of Computer, Design of Accumulator Logic.	**15**	**20**
3	**Basic Computer Programming, Micro Programmed Control** Introduction, Machine Language, Assembly Language, the Assembler, Program Loops. Programming Arithmetic and Logic Operation, Subroutines, I/O–Programming. Control Memory; Address sequencing, Micro Program Example, Design of Control Unit**.**	**15**	**20**
4	**Central Processing Unit** Introduction to Central Processing Unit, General Register Organization, Stack. Organization Instruction Formats, Addressing Modes, Data Transfer, and Manipulation. Program Control, RICS, and CISC.	**10**	**25**
5	**Pipeline, Vector Processing** Parallel Processing; Pipelining-Arithmetic Pipelining, Instruction Pipelining, RISC Pipelining Vector Processing, Array Processor, Asynchronous Data Transfer, DMA, Priority Interrupt.	**10**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Analyze	Evaluate
Weightage	40	10	20	30

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Identify various parts Of the System's memory Hierarchy
CO2	Understand pipeline and Parallel Processing Techniques
CO3	Analysis of How Central Processing Works
CO4	Understand Numbering systems and conversion of numbering systems
CO5	Comprehend the features and performance parameters of different types of computer architectures.

Reference Books

1.	**Computer System Architecture (TextBook)** By M. Morris Mano | Pearson
2.	**Structured Computer Organization** By Andrew S. Tanenbaum and Todd Austin | PHI

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Skill Enhancement Courses	
Prerequisite	Basic English proficiency and a willingness to engage in personal growth and communication enhancement.	
Course Objective	1. Effective Communication: Develop proficiency in English communication for both personal and professional contexts. 2. Improve relationships and interactions through better self-awareness and interpersonal strategies. 3.Cultivate self-confidence in public speaking and presentation skills. 4. Develop leadership qualities and teamwork abilities for career advancement. 5. Foster personal growth and emotional intelligence to excel in various aspects of life.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
0	0	2	1	70	30	-	-	100

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Fundamentals of grammar** Parts of Speech (Noun, Pronoun, Adjective, Verb, Adverb, Conjunction, Preposition, Interjection) Article Tense: Application of tenses with respect to time, All tenses & their Sub-divisions Forming of Sentences & Clauses, "WH's Concepts, Understanding Sentences, Punctuation I, Degree of comparison I (Positive, Comparative & Superlative), Tenses (Introduction & Usage) Vocabulary (Roots, Prefix, Suffix, Homonyms, Synonyms & Antonyms)Auxiliaries, Modal Verbs	**12**	**25**
2	**Listening** Introduction, Definition of Listening, Listening vs Hearing, Process of Listening, Problems Students Face in Listening, Strategies of Listening, Barriers to Listening, Listening in the Workplace, Activities That Help you to become better listeners.	**11**	**25**
3	**Reading** Introduction, The Reading Process, Reading and Meaning, Methods to improve Reading, Strengthening your Vocabulary, Understanding Graphics and Visual Aids, Previewing, Reading in thought Groups, Avoiding the Re-reading of the same phrases, Barriers to Reading, Skills for Speed Reading, Sub-Skills of Reading, Skimming, Scanning, Extensive Reading, Intensive Reading, Reading E-Mail, E-Books, Blogs and Web Pages.	**11**	**25**
4	**Letter writing** Formal and informal; CV; Report Writing; Presentation as a skill Elements of Presentation Strategies – Audience – Objectives – Medium - Key Ideas, Structuring The Material, Organizing Content, Audio -Visual Aids – Handouts - Use of Power Point	**11**	**25**
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy				
Level	Understanding	Analyze	Evaluate	Create
Weightage	25	25	25	25

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Develop proficiency in English communication for both personal and professional contexts.
CO2	Improve relationships and interactions through better self-awareness and interpersonal strategies.
CO3	Cultivate self-confidence in public speaking and presentation skills.
CO4	Develop leadership qualities and teamwork abilities for career advancement.
CO5	Foster personal growth and emotional intelligence to excel in various aspects of life.

Reference Books

1.	**High School English Grammar &Composition (TextBook)** By Wren & Martin | Blackie
2.	**Learn English vocabulary at a Glance** By Dr. Rakesh Bharadwaj | Dr. Rakesh Bharadwaj
3.	**Kenneth, Anderson, Tony Lynch, Joan Mac Lean. (TextBook)** By Study Speaking. | New Delhi: CUP
4.	**Effective Business Communication** By Asha Kaul | Prentice Hall – Economy Edition
5.	**Writing with a purpose (TextBook)** By Champa Tickoo and Jaya Sasikumar | oxford University Press, Mumbai

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Basic computer and internet usage skills; no prior programming experience needed.	
Course Objective	*To introduce students to the fundamentals of front-end web development using HTML, CSS, and JavaScript. *To equip learners with the skills to build responsive, interactive, and well-structured web pages. *To develop a strong foundation for further learning in modern web technologies and frameworks.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	2	4	70	30	-	50	150

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Web Development and HTML** Overview of Web Development, Front-end vs Back-end, Basic Structure of a Web Page, Introduction to HTML, HTML Elements and Attributes, Common HTML Tags (headings, paragraphs, links, images, lists, tables). **Lab Activities:** • ◦ Setting up the development environment ◦ Creating your first HTML page ◦ Creating a multi-page website with navigation	**12**	**20**
2	**Unit 2: Introduction to CSS** Introduction to CSS, CSS Syntax and Selectors, Colors, Fonts, and Text Styling, The Box Model, CSS Positioning (static, relative, absolute, fixed), Flexbox Layout, CSS Grid Layout, Responsive Web Design (Media Queries). **Lab Activities:** • ◦ Applying CSS to HTML pages ◦ Styling text and layouts ◦ Creating responsive layouts using Flexbox and Grid ◦ Implementing a responsive navigation bar	**12**	**15**
3	**Unit 3: Introduction to JavaScript**	**12**	**20**

	Introduction to JavaScript, JavaScript Syntax and Variables, Data Types and Operators, Control Structures (if, else, switch, loops), Functions and Scope, Arrays and Objects, Introduction to ES6 Features. • **Lab Activities:** • ◦ Writing basic JavaScript programs ◦ Creating interactive forms ◦ Creating and manipulating arrays and objects		
4	**Unit 4: JavaScript in the Browser**	**12**	**20**

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
	The Document Object Model (DOM), Selecting and Manipulating DOM Element, Event Handling, Introduction to AJAX and Fetch API, Basic Error Handling. **Lab Activities:** • ◦ ▪ Creating dynamic web pages with DOM manipulation ▪ Implementing event listeners for user interactions ▪ Fetching data from APIs and displaying it on the web page		
5	**Unit 5: Version Control and Final Project**	**12**	**25**
	Introduction to Git and GitHub, Basic Git Commands (init, clone, add, commit, push, pull), Collaborating with GitHub, Project Planning and Development, Best Practices in Front-end Development, Course Review and Q&A. **Lab Activities:** • ◦ ▪ Setting up a Git repository ▪ Pushing and pulling code to/from GitHub ▪ Final Project: Building a fully functional and responsive website ▪ Presenting the final project		
	Total	**60**	**100**

List of Practical

1.	Favorite Books List: Create an HTML page with an ordered list of your top five favorite books and an unordered list of your top five favorite authors. Use CSS to change the font color for each item and add extra padding between items.
2.	Daily Exercise Schedule: Design a table that displays a daily exercise routine, with rows for each day of the week and columns for morning, afternoon, and evening activities. Use CSS to add cell borders, alternate row colors, and style the headers to stand out.
3.	Registration Form: Design a registration form with fields for "Username," "Password," "Email," and "Confirm Password." Style the form fields with padding, consistent borders, and a background color to make them visually appealing. Include a submit button styled to stand out.
4.	Survey Form: Create a survey form with fields for "Name," "Age," "Gender" (radio buttons), and a text area for "Feedback." Style the form fields with background colors, borders, and padding, and use a bold color for the submit button.

5.	Two-Column Layout for Resume: Create a basic resume page with a two-column layout using CSS Flexbox or Grid. The left column should include sections for "Contact Information" and "Skills," while the right column includes sections for "Experience" and "Education." Style each section distinctly.
6.	Three-Section Personal Profile Page: Design a personal profile page with three sections: "Biography," "Interests," and "Gallery" (displayed as image thumbnails). Style each section with different background colors and add padding to space out the content.
7.	Center a Div: Create a div with a width and height of 200px and a background color of your choice. Center this div both vertically and horizontally within the viewport using CSS.
8.	Button Click to Display Message: Create a button that, when clicked, displays the message "Hello, welcome to the page!" below the button. Use an onclick function in JavaScript to handle this action.
9.	Button Click to Toggle Visibility: Create a button that toggles the visibility of an image on the page. When the button is clicked, the image should either hide or show depending on its current state. Use the onclick event to toggle visibility.
10.	Mouseover Event for Color Change: Create a paragraph of text that changes its background color when the user hovers over it. Use the onmouseover and onmouseout events to apply and remove the color.
11	Git Commands for Uploading Content to GitHub Initialize Git Repository and Add All Files: Use commands to initialize a Git repository in the project folder, add all files to staging, and commit them with an appropriate message.
12	Push to GitHub Repository: Assuming a GitHub repository is already created, use commands to add the remote repository, then push all files to GitHub.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Basic Command Line Skills, Fundamental Programming Knowledge	
Course Objective	To equip learners with the skills to efficiently use Git for version control and GitHub for collaboration in modern software development.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				Examination Scheme				
Lecture	Tutorial	Lab	Credit	Theory Marks		Practical Marks		Total Marks
				T	T	P	P	
1	0	2	2	70	30	-	50	150

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Introduction to Version Control and Git** Introduction to Version Control Systems (VCS) ,, Benefits of using Git , Installing Git on Windows, macOS, and Linux ,, Configuring Git (user name, email, and other settings) ,, Basic Git commands: init, clone, status, add, commit, log ,, Understanding the Git workflow (working directory, staging area, repository)		
2	**Working with Repositories** Creating and cloning repositories , Understanding commits and commit messages , Viewing commit history with git log , Understanding branching and merging , Creating and working with branches (branch, checkout, merge) , Resolving merge conflicts , Deleting and renaming branches		
3	**Advanced Git Operations** Understanding and using git stash , Rewriting history with git rebase , Interactive rebase (git rebase -i) , Cherry-picking commits (git cherry-pick) , Tagging commits (git tag) , Working with remote repositories (remote, fetch, pull, push) , Forking and contributing to open-source projects		
4	**Collaborating with GitHub** Introduction to GitHub and its features ,, Creating and managing GitHub repositories ,, Cloning GitHub repositories ,, Understanding GitHub workflows: Issues, Pull Requests, Code Reviews ,, Creating and managing Pull Requests ,, Collaborating on repositories with Issues and Projects ,, Utilizing GitHub Wikis and Pages		
5	**Automation and Deployment with GitHub** Introduction to GitHub Actions , Setting up CI/CD pipelines with GitHub Actions , Writing and running workflows , Deploying applications using GitHub Actions , Automating common tasks with GitHub Actions , Integrating third-party services with GitHub		
	Total		

Reference Books

1. **Pro Git Paperback (TextBook)**
By Scott Chacon , Ben Straub, Pub. Year 2014

List of Practical	
1.	Initialize a Git Repository: In a new folder, initialize a local Git repository. Verify it by checking the status of the repository.
2.	Create a New File and Make an Initial Commit: Add a new file called notes.txt, write a short message in it, add the file to staging, and make an initial commit. Verify the commit with git log.
3.	Edit a File and Make a Second Commit: Modify the notes.txt file by adding more text. Stage the changes and make a second commit with an appropriate commit message. Check the commit history to confirm.
4.	Stage Changes: Edit multimpe files, after making changes to multiple files, use a single command to add all modified files to the staging area in preparation for a commit.
5.	Create a Branch and Switch to It: Create a new branch called feature-update, switch to this branch, and confirm the current branch using the git branch.
6.	Make a Commit in the New Branch: Add a new file, feature.txt, in the feature-update branch. Stage it, commit it, and verify the commit history in this branch.
7.	Merge Branches: Switch back to the main branch and merge the changes from the feature-update branch. Confirm the merge using git log and check for any conflicts.
8.	Delete a Branch: After merging, delete the feature-update branch locally. Verify that the branch is removed with git branch.
9.	Fork a Repository: Fork an open-source repository on GitHub. Clone the forked repository to your local machine.
10.	Make a Change and Open a Pull Request (PR): Edit the README.md file in your local fork, commit the change, push it to your GitHub fork, and open a PR to the original repository. Add a meaningful title and description, then close the PR without merging.
11	View Commit History with git log: Use git log to view the history of all commits in your repository. Practice adding options to display commit history with one-line summaries and limited entries.
12	Stage Multiple Files at Once: Create two new files, file1.txt and file2.txt. Stage them both simultaneously using a single Git command and commit with a descriptive message.
13	Set Up a Remote Repository: Initialize a local repository, add a new file, and then link it to a remote GitHub repository. Push the initial commit to the GitHub repository.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 1**
Type of Course	Core Courses	
Prerequisite	Basic knowledge of computer fundamentals and logical reasoning	
Course Objective	To introduce the fundamentals of programming using the C language, covering syntax, data types, operators, and control structures. To develop problem-solving skills through the use of arrays, functions, pointers, structures, and file handling. To prepare students for advanced programming by building a strong foundation in structured and modular coding techniques.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	2	4	70	30	-	50	150

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction** **Fundamental of Computer-** Basic block diagram of Computer components, hardware, software, memory, generation of computer, Flowcharts and algorithm **Overview of C-** Introduction, Importance of C, Sample C programs, Basic structure of C programs, Programming style, Executive a C program. **Constants, Variables, and Data Types-** Introduction, Character Set, C tokens, Keywords and Identifiers, Constants, Variables, Data types, Declaration of Variables, assigning values to variables, Defining symbolic constants. **Operators and Expression-** Introduction, Arithmetic of Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bit-wise Operators, Special Operators, Arithmetic Expressions, Evaluation of expressions, Precedence of arithmetic operators, Some computational problems, Type conversions in expressions, Operator precedence and associatively, Mathematical function	**15**	**20**
2	**Management Input and Output Operators, Decision-Making statement** Introduction, reading a character, writing a character, formatted input, formatted output, the structure of c program input-output function Introduction, Decision-making with IF statement, Simple IF statement, the IF ELSE statement, Nesting of IF … ELSE statements, The ELSE IF ladder, The switch statement, the turnery (? :) Operator, the GOTO statement.	**10**	**20**
3	**Loop and arrays** **Decision-Making Looping-** Introduction, the WHILE statement, the DO statement, and The FOR statement, Jump in loops Break and continue. **Array-** Introduction, One-dimensional arrays, Two-dimensional arrays, Initialization of two-dimensional arrays, Concept of Multidimensional arrays	**10**	**20**
4	**Handling of Character strings, User-Defined Functions** Introduction, Declaring and initializing string variables, reading string from the terminal, writing a string to the screen, Arithmetic operations on characters, Putting string together, String Operations String Copy, String Compare, String Concatenation and String Length, String Handling functions. Introduction, Need for user-defined functions, The form of C function, Return values, and their types, Calling a Function, category of functions, No arguments and no return values, Arguments with return values, Handling of non-integer functions, Nesting of functions, Recursion, Functions with arrays, The scope and Lifetime of variables in functions, ANSI C functions.	**15**	**20**
5	**Structures and Unions, Pointers, File Management in C** Introduction, Structure definition, giving values to members, Structure initialization, Comparison of structures, Arrays of structures, Arrays within structures, Structures within Structures, Structures, and functions, Unions, Size of structures, and Bit fields. Introduction, understanding pointers, Accessing the address of a variable, Declaring and initializing pointers, Accessing a variable through its pointer, Pointer expressions, Pointer increments and scale factor, Pointers and arrays, Pointers and character strings, Pointers and Functions, Pointers, and structures. Dynamic memory allocation. Introduction, Defining files and their Operations, Error handling during I/O operations, Random access files, Command line arguments	**10**	**20**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy				
Level	Remembrance	Understanding	Application	Analyze
Weightage	10	30	30	30

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Formulate algorithm/flowchart for given arithmetic and logical problem
CO2	Translate the algorithm/flowchart into C program using the correct syntax and execute it.
CO3	Write a program using branching ,looping, iteration and recursion.
CO4	Implement simple program using structure and Union.
CO5	Implement simple program using array and pointer.

Reference Books

1.	**Let Us C (TextBook)** By Yashwant Kanetker | BPB Publication
2.	**ANSI C** By Balaguruswami | Wiley India Pvt Ltd
3.	**"Computer programming" (TextBook)** By Ashok N. Kamthane | Pearson Education

List of Practical

1.	Write a program to display "Hello Computer" on the screen.
2.	Write a C program to display Your Name, Address and City in different lines.
3.	Write a C program to find the area of a circle using the formula: Area = PI * r.
4.	Write a C program to print the multiply, addition, division & subtraction value of two accepted numbers.
5.	Write a C program to swap a variable value of no1 and no2.
6.	Write a program to find a maximum from given two numbers.
7.	Write a program to find a minimum from given two numbers.
8.	Write a program to find a maximum from given three numbers.
9.	Write a program to find a minimum from given three numbers.
10.	Write a C program to print a multiplication table from 1 to 12.
11.	Write a C program to find addition of 45 to 65 using loop.
12.	Write a C program to check whether a number is prime or not.
13.	Write a C program to show month using Switch statement.
14.	Write a C program to print the 3x3 array.
15.	Write C program to print range of 101 to 130 using array.

16.	Write a C program to find the length of the given string.
17.	Write a C program to copy one string into another string.
18.	Write a C program to concate (merge) the two strings.
19.	Write a C program to print the following shape. * * * * * * * * * *
20.	Write a C program to find the addition of two values using function.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Engineering Science	
Prerequisite	030001101 - MATHEMATICS-I	
Course Objective	Basic Mathematics	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				Examination Scheme				
				Theory Marks		Practical Marks		
Lecture	**Tutorial**	**Lab**	**Credit**	**T**	**T**	**P**	**P**	**Total Marks**
3	0	0	3	70	30	-	-	100

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	Topics	T	W
1	**Review of the maxima & minima, point of inflexion, Asymptotes, Curve Tracing**	**13**	**28**
	Review of the maxima & minima, point of inflexion. Introduction of Asymptote, Types of Asymptotes: Asymptote parallel to x-axis, Asymptote parallel to y-axis, oblique Asymptote, Rules to find Asymptote parallel to x-axis, Rules to find Asymptote parallel to y-axis, Rules to find Curve Tracing oblique Asymptote, problems based on Asymptote. Multiple point, cusp, node, symmetry about x-axis, symmetry about y-axis, symmetry about x=y line, symmetry about opposite coordinate, Origin, tangent, intercept, tracing of curve.		
2	**Gamma Function & Beta Function**	**10**	**22**
	Introduction Gamma function, the value of Gamma(without proof), Problem based on Gamma function, Beta functions, Relation between Beta and Gamma function, Show that B(m, n)=B(n, m), Problem-based on Beta Function, application to the area, volume, Define Dirichlet integral, Problem-based on Dirichlet integral.		
3	**Double and triple integral**	**9**	**20**
	Introduction, Double Integral, Problems based on Double Integral, Change of order of integration, Problems based on Change of integration, Change of variables, Problem based on Change of variables, Triple integral, Problem based on Triple Integral		
4	**Differential of Vector**	**6**	**14**
	Introduction, Point function, Gradient, Problems based on Gradient of a vector, Divergence of a vector, Problems based on divergence Curl of a vector, Problems based on curl and their physical interpretations.		
5	**Integration of Vector**	**7**	**16**
	Line integral, problems based on line integral, Surface integral, problems based on Surface integral, Volume integral, Problems based on Volume integral, Green's theorem(without proof) and problems based on Green's theorem, Stoke's theorem(without proof), problems based on Stoke's theorem, Gauss divergence theorems (without proof), problems based on Gauss divergence theorems.		
	Total	**45**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	50	20	10	10	5	5

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Student will be able to tracing a curve able to explain relation between Gamma and beta function.
CO2	Student will able to solve double and triple integral and change of variable in integral.
CO3	Student will able to understand gradient, divergence and curl.
CO4	Student will be able to use vector integration.
CO5	Student will be able to solve problem based of Green's theorem, Stock's theorem and Gauss divergence theorem.

Reference Books	
1.	**Higher Engineering Mathematics** By Dr. B. S. Grewal
2.	**Advanced engineering mathematics** By Mishra V P | V P Mishra Publishers, New Delhi 2009

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	030801101 - PROGRAMMING IN C	
Course Objective	1. To organizing data for implementation of efficient algorithms and program development. 2. To develop the capability of selecting a particular data structure. 3. To develop application using array, structure, function, pointer and file	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	2	4	70	30	-	50	150

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Data Structure, Types of Data Structures** Introduction to Data Structure and Algorithm Data Types, primitive and non-primitive Performance Analysis and Measurement Linear & Non Linear Data Structures. String, Introduction, Operation performed on string Array, Introduction to Arrays, Linear array and its representation Binary Search and Linear Search with algorithm Pointers, Records and its representations., Recursion, Tower of Hanoi.	**10**	**15**
2	**Link List, Stack, Queue (Linear data Structure)** Introduction of stack, PUSH and POP operation along with algorithms, Application of Stack Expression Conversion: Prefix, Postfix ,Infix Link List Introduction, Types of Link List, Operations along with Algorithms-Insert, Delete, Search, Traverse, Application Queue types and Representation of Queue -Simple, Circular, Dequeue, Priority Operations Performed on Queue-Insert, delete, search, Application of Queue	**15**	**20**
3	**Tree and Graphs-(Non Linear)** Introduction of different trees and its representations, Types of Tree, Traversal algorithm, Binary search tree, Insert, Delete, Search in tree, Conversion of General Trees To Binary Trees, Applications Of Trees, Heap tree Graphs, Basic Terminology and Representation, Traversal of Graph, Sequential representation of graphs, Link list of graph, Graph-Matrix Representation of Graphs, Operations on graphs	**15**	**20**
4	**Hashing and File Structure, File Organization** Hashing, Hash Table, Hash Function, Hashing Technique, Collision, Collision Resolution Techniques File Organization, Introduction to File, Types of File Organization, Concepts of fields, records and files, Sequential, Indexed and Relative/Random File Organization, Indexing structure for index files, hashing for direct files, Multi-Key file organization and access methods.	**10**	**20**
5	**Sorting and Searching** Sorting types, Insertion, sort, Selection Sort, Quick Sort, Merge Sort, Radix sort, Searching types, Sequential Search and Binary Search	**10**	**25**
	Total	**60**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	10	15	15	20	20	20

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Discuss The Basic Concept and Principle of Data Structure
CO2	Implement Data Strcuture And Algorithm to Solve Problem.
CO3	Learn the Basic Techniques of Algorithm Analysis
CO4	Descibe various Tree and Graph travsersal Algorithm
CO5	Differentiate Primitive and Non Primitive Structures

Reference Books	
1.	**An Introduction to Data Structures with Applications (TextBook)** By Jean-Paul Tremblay & Paul G. Sorenson | Tata McGraw Hill.
2.	**Data Structures using C & C++** By Ten Baum | Prenctice-Hall International
3.	**Fundamentals of Computer Algorithms by** By Horowitz, Sahni | Galgotia Pub. 2001 ed.

List of Practical	
1.	Write a C program to display linear array elements.
2.	Write a C program to calculate length of a given string.
3.	Write a C program to perform index operation on a given String.
4.	Write a C program to Concate two String.
5.	Write a C program to find Sub string of given string.
6.	Write a C program to implement PUSH and POP operation of STACK.
7.	Write program to implement simple queue using C language.
8.	Write a C program to search an element using linear search.
9.	Write a C program to search an element using Binary search.
10.	Write a C program to sort given list using Insertion sort.
11.	Write a C program of matrix addition.
12.	Write a C program of matrix multiplication.
13.	Write a C program to traverse single linked list.
14.	Write a C program to implement Bubble sort.
15.	Write a C program to implement Radix sort.
16.	Write a C program to implement Merge sort.
17.	Write a C program to implement Selection sort.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	030801101 - PROGRAMMING IN C	
Course Objective	Basic understanding of C++ syntax and programming concepts. Familiarity with variables, loops, functions, and arrays. Fundamental knowledge of memory management and pointers in C++.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	2	4	70	30	-	50	150

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction of OOPS, C++ Basics** Introduction to Object Oriented Programming, Difference between Procedure Oriented and Object Oriented Programming, Difference between C and C++ Data types, Declaration of variables, Expressions, Operators, Operator Precedence, Evaluation of expressions, Type conversions, Pointers, Arrays, Pointers and Arrays, Strings, Structures, and References. Flow control statement- if, switch, while, for, do, break, continue, go to statements. Functions - Scope of variables, Parameter passing, Default arguments, inline functions, Recursive functions, Pointers to functions. Dynamic memory allocation and de-allocation operators-new and delete Preprocessor directives.	**15**	**20**
2	**Principles of OOP, Classes, Object and Function, Constructor & Destructor** Structure of a C++ program, Class, Object, Inheritance, Polymorphism, Dynamic Binding, Message Passing. Introduction to Class and Objects, Access Specifier, Memory Allocation for object, Simple Function, Call and Return by Reference, Static data, Function and Members, Inline Function, Function Overloading, Friend Functions, Friend Class, Array of Class Object. Constructor, Characteristics of Constructor, Types of Constructor, Destructor, Characteristics of Destructor	**15**	**20**
3	**Inheritance, Polymorphism** Introduction, Advantages of Inheritance, Inheritance using different access Specifiers, Initialization of Base class members through a derived class object, Different forms of Inheritance, Virtual Base Classes, Abstract Class, Function Overriding. Overloading unary-binary operators, data conversion, pitfalls of operators overloading and conversion keywords, function overloading, Explicit and Mutable.	**10**	**20**
4	**Operator Overloading, Virtual Function** Introduction to Operator overloaded, Rules for Overloading Operator, Declaration of Operator Overloading, Unary Operator Overloading, Binary Operator Overloading, Data Conversion, and Type Conversions Inline function, Virtual Function, friend function, Static function, Assignment and copy initialization, this pointer, dynamic type information	**10**	**15**
5	**Files & Pointers, Exception Handling** I/O using C functions, Stream classes' hierarchy, Stream I/O, File streams and String streams, Overloading operators, Error handling during file operations, Formatted I/O. Benefits of exception handling, Throwing an exception, The try block, Catching an exception, Exception objects, Exception specifications, Stack unwinding, Re-throwing an exception, Catching all exceptions.	**10**	**15**
	Total	**60**	**90**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	0	40	20	40	0	0

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand the basic concept of C++.
CO2	Apply the concept of OOPs.
CO3	Analyze the concept of inheritance and polymorphism.
CO4	Analyze the concept of operator overloading and virtual function.
CO5	Understand the concept of Files & Pointers along with Exception Handling.

Reference Books

1.	**Object Oriented Programming with C++ (TextBook) (TextBook)** By E Balaguruswami | The Mc Graw-Hill Education India Pvt. Ltd
2.	**Let us C++** By Y kanitkar | BPB Publication
3.	**Object-oriented programming in Turbo C++** By Robert Lafore | Galgotia Publications Pvt Ltd

List of Practical

1.	Write a program in C++ that takes the input of the age of 3 people by the user and finds out the oldest and youngest among them.
2.	Write a program in C++ to find positive or negative values using if else from the user input.
3.	Write a program in C++ to find out if a number is divisible by 5 and 7 using an if-else statement.
4.	Write a program in C++ to find out if a number is odd or even using user input.
5.	Write a program in C++ to find out profit or loss using user input.
6.	Write a program in C++ to check if a year is a leap year or not using input from the user.
7.	Write a program in C++ to find out if the input number is Armstrong or not using a loop (User Input).
8.	Write a program in C++ to find out if the input number is Palindrome or not using a loop (User Input).
9.	Write a program in C++ to find out the 1st 10 Fibonacci series numbers using a loop (User Input).
10.	Write a program in C++ to find out the factorial of a given number using a loop (User Input).
11.	Write a program in C++ to find out whether a given number is prime or not using a loop (User Input).
12.	Write a program in C++ to perform Multilevel GCD and LCM of the given number (User Input).
13.	Write a program in C++ that asks the user to enter marks of 5 subjects and print the corresponding grade using Switch Case.
14.	Write a program in C++ to perform Single inheritance.

15.	Write a program in C++ to perform Multilevel inheritance.
16.	Write a program in C++ to perform Hierarchical inheritance.
17.	Write a program in C++ to perform Multiple inheritance.
18.	Write a program in C++ to perform Hybrid inheritance.
19.	Write a program in C++ to perform Method Overloading.
20.	Write a program in C++ to perform Method Overriding.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	03050201-T - ELEMENTS OF ELECTRICAL ENGINEERING	
Course Objective	1. Understanding of principle, operation, and analysis of digital electronics. 2. Represent various number systems & perform conversions among them. 3. Design digital combinational circuits. 4. Analyze sequential digital circuits like flip-flops, registers, and counters. 5. Introduction to processor and controller.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	2	3	70	30	-	50	150

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Binary number system and logic gates** Digital computer and digital systems, Binary Numbers, Number base conversion Octal and Hexadecimal Numbers, complements, Binary Codes, Binary Storage and register, Binary Logic, and Integrated Circuit. Various Codes like Weighted, EXCESS-3, Grey codes, ASCII codes, and Code Conversion. Introduction, Laws of Boolean algebra, Demorgan's theorem, Positive and Negative logic, Basic logic gates: AND, OR, NOT, XOR, XNOR GATES & Respective Boolean Function, Truth table, Universal Logic Gates, NAND, NOR, etc.	**12**	**25**
2	**Combinational Logic Design** Review of Boolean Algebra and De Morgan's Theorem, SOP & POS forms, Canonical forms, Karnaugh's maps, don't care conditions, Half and Full Adders, Subtractors, Serial and Parallel Adders, BCD Adder. decimal adder, magnitude comparator, decoder, demultiplexer, multiplexer, ROM, and Programmable Logic Array.	**10**	**20**
3	**Sequential Logic Design** Latch, R-S, J-K master-slave, J-K, D-type flip-flops, Triggering of flip-flops, Analysis, and design of sequential circuits using state tables, diagrams, equation reductions, and assignments. Registers, left shift, right shift, serial-parallel input-output combinations, ripple, and synchronous counters, Up-Down counting, word time generation, Johnson counter. Timing Sequences, Memory Unit	**12**	**25**
4	**Logic Families and Semiconductor Memories** Introduction, Bipolar transistor characteristics, characteristics of RTL, DTL, IIL, TTL, MOS, CMOS, ECL CIRCUITS. Specifications, Noise margin, Propagation delay, fan-in, fan-out, etc.	**6**	**15**
5	**Processor & Control Logic Design** Introduction, Processor organization, Arithmetic logic unit, Design of ALU, Status register, design of shifter, Processor Unit, and Design of accumulator. Introduction, Control Organization, Hard-Wired Control, Micro-Program Control.	**6**	**15**
	Total	**46**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy						
Level	Remembrance	Understanding	Application	Analyze	Evaluate	Create
Weightage	20	20	20	20	10	10

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Apply knowledge of Boolean algebra and other minimization techniques for digital circuit design.
CO2	Identify, formulate, and solve a problem based on combinational and sequential circuits.
CO3	Select the appropriate hardware and software tools for combinational and sequential circuit design.
CO4	To Understand the basics of semiconductor devices and logic families.
CO5	To Understand the fundamentals of processor and controller.

Reference Books

1.	**DIGITAL ELECTRONICS** By G. K. KHARATE | OXFORD UNIVERSITY PRESS | FOURTH, Pub. Year 2011
2.	**Digital Logic And Computer Design** By Morrismano | PHI
3.	**Digital Principles And Applications** By Malvino And Leach
4.	**Modern Digital Electronics"** By R. P. Jain | TMH

List of Practical

1.	To study the basic logic gates: AND, OR, NOT, XOR, XNOR.
2.	To study and verify universal gates and: NAND, NOR.
3.	To study Boolean algebra and Demorgan‟s theorem.
4.	To study full-adder and half-adder circuits.
5.	Code Converter Circuit – Binary to Grey and Grey to Binary.
6.	To study magnitude comparator – 4 bit and 8 bit
7.	To implement an 8 X 1 multiplexer.
8.	To verify various flip-flops: SR, D, T, and JK.
9.	To study counters: BCD counter.
10.	To study TTL logic and CMOS logic of gate implementation.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Ability Enhancement Courses	
Prerequisite	Basic knowledge of ecology, sustainability, and environmental issues.	
Course Objective	1. To introduce the multidisciplinary nature of environmental studies and its significance in understanding global and local environmental issues. 2. To develop the ability to analyse ecological concepts and ecosystem functions, emphasizing their interdependence and role in maintaining environmental balance. 3. To enable students to apply fundamental concepts of environmental chemistry in understanding natural processes and pollution dynamics. 4. To develop analytical skills to evaluate human activities; impacts on biogeochemical cycles and explore strategies to mitigate environmental pollution.	
Effective From A.Y.	2024-25	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	0	3	70	30	-	-	100

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction** The multidisciplinary nature of environmental studies. Environmental Science – definition, scope & importance, Evolution of the universe, the origin of the earth; solar system; the atmosphere of the primitive earth	**7**	**25**
2	**Ecology** Ecology & its branches, the scope of Ecology and its relation to other divisions of sciences; autecology and synecology, Concept and structure of ecosystem, functions of ecosystem, Types of Ecosystems,	**8**	**25**
3	**Ecosystem** Concept and scope of environmental chemistry, chemical toxicology, hazardous chemicals, carcinogens, occupier, effluent etc. The natural cycles of the environment, Ozone depletion –causes and effects; Global warming – major greenhouse gases, causes and effects; Acid rain –causes and effects,	**8**	**25**
4	**Biogeochemical cycles and Environmental Pollution** Biogeochemical cycles: Carbon cycle, Nitrogen cycle, Oxygen cycle, Water cycle Environmental Pollution: Types of Environmental Pollution, Water Pollution, Air Pollution, Land and Noise Pollution	**7**	**25**
	Total	**30**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy

Level	Understanding	Analyze	Evaluate	Create
Weightage	45	45	10	0

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes

At the end of this course, students will be able to:	
CO1	Understand the Multidisciplinary Nature & Valuation of Environmental Studies.
CO2	Analyze Ecological concepts and Ecosystem functions.
CO3	Applying Environmental Chemistry Concepts.
CO4	Analyze Human Impact on Biogeochemical cycles and pollution.

Reference Books

1.	**Textbook of Environmental (TextBook)** By Erach Bharucha | Universities Press (India) Private Ltd, Hyderabad. | Second edition, Pub. Year 2013
2.	**Environmental Sciences** By Daniel B Botkin & Edward A Keller | John Wiley & Sons.

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Course	Bachelor of Technology (B.Tech.)	**Semester - 2**
Type of Course	Core Courses	
Prerequisite	03080101-T - PROGRAMMING IN C	
Course Objective	1. To understand the Fundamental of Database Management System, RDBMS and locking mechanism. 2. To learn the fundamental of data models and SQL query. 3. To develop application using PL/SQL blocks.	
Effective From A.Y.	2025-26	

Teaching Scheme (Contact Hours)				**Examination Scheme**				
Lecture	**Tutorial**	**Lab**	**Credit**	**Theory Marks**		**Practical Marks**		**Total Marks**
				T	**T**	**P**	**P**	
3	0	2	4	70	30	-	50	150

***SEE** - Semester End Examination, **T** - Internal Theory, **P** - Internal Practical*

Course Content

T - Teaching Hours | **W** - Weightage

Sr.	**Topics**	**T**	**W**
1	**Introduction to Database System Concepts and Architecture** Database and Users: Introduction (Basic Concepts: Data, Database, Database systems, Database Management Systems), Characteristics of Database Approach, Advantages of using the DBMS approachDatabase System Concepts and Architecture, Data Models, Schemas, Instances, the three schema architectures and data independence, Database Languages and interfaces, Database System environment, Centralized and client / Server Architecture for DBMS, Classifications of Database Management Systems	**12**	**20**
2	**Entity Relationship Diagram** Using high level conceptual data models for database design (Design Phases of database design), Entity types, Entity Sets, Attributes and keys, Relationship Types, Relationship sets, Roles and structural constraints, Weak entity Types, Refining the ER diagram for company Database, Entity Relationship Diagram Naming conventions Design issues, Example of other Notation: UML class diagram, Relationship types of degree higher than 2 Subclasses, Super Classes, Inheritance Specialization and GeneralizationRelational Database design by ER and EER to Relational Mapping, Mapping EER model construct to Relations	**12**	**20**
3	**Database Design** Informal Design Guidelines for Relational Schema, Functional Dependencies, Normal Forms based on Primary keys, General definitions of 1NF, 2NF and 3NF, Boyce-Codd Normal Forms (BCNF), Multi-valued Dependency and Fourth Normal Form	**12**	**20**
4	**Transaction processing** Introduction to Transaction Processing Concepts: Introduction to Transaction Processing, Transaction and System concepts, Desirable properties of Transactions, characterizing Schedules based on recoverability and Serializability	**12**	**20**
5	**Relational Model Concept** Relational Model concepts: Relational Model concepts, Relational Model constraints and Relational Database Schemas	**11**	**20**
	Total	**59**	**100**

Suggested Distribution Of Theory Marks Using Bloom's Taxonomy					
Level	Remembrance	Understanding	Application	Analyze	Create
Weightage	20	20	10	20	30

NOTE : This specification table shall be treated as a general guideline for the students and the teachers. The actual distribution of marks in the question paper may vary slightly from above table.

Course Outcomes	
At the end of this course, students will be able to:	
CO1	Learn how to manage databases and their relations.
CO2	Design the database schema with the use of appropriate data types for data storage in database.
CO3	Understand the uses the database schema and need for normalization
CO4	Use different types of physical implementation of database and understand ER diagram.
CO5	Write a program using SQL queries to implement join and trigger.

Reference Books	
1.	**Fundamentals of relational database management systems (TextBook)** By S.Sumathi | Springer
2.	**Relational Database** By Dr.ms.Manisha Bharamde and Abhijeet D.Mankar | Nirali Prakashan

List of Practical	
1.	Construct an E-R diagram for a hospital with a set of patients and a set of medical doctors. Associate with each patient a log of the various tests and examinations conducted
2.	Consider the enitity EMPLOYEE with following attributes: Practical on RDBMS . Emp-ID Employee-Name Address Phone Dependent-Name Relationship~to~Employee Skill Designation Designation-Start-Date Salary Salary-StarLDate Using the EMPLOYEE entity, convert each of the one-to-many association into a weak entity and a relationship. Identify the discriminator of each weak entity and the attributes of each relationship.
3.	The people's Bank offers five types of accounts: loan, checking, premium savings, RDBMS daily interest saving, and money market. It operates a number of branches and a client of the bank can have any number of accounts. Accounts can be joint, i.e., more than one client may be able to operate a given account. Identify the entities of interest and show their attributes. What relationships exist anlong these entities? Draw the corresponding E-R diagram
4.	A University decides to computerise it's registration system. Identify the possible entities and relationships and Draw the E-R Diagram.
5.	In the Database file Add these Fields: (Total: Datatype- Number 3 digits, Percentage: Datatype – Number 3 digits with 2 decimal places, Grade: Datatype- Char with 2 letters)
6.	Create Marksheet table and Insert more 3 records in MARKSHEET using SQL mode.
7.	Update the values for newly added columns i.e. Total, Percentage, Grade table using UPDATE command.
8.	Display all records of the marksheet table, write SQL command.
9.	Display all records of the marksheet table, write SQL command.
10.	Display name, rollno, marks of 3 subjects, total and percentage using design view
11.	Write SQL command to display name, rollno, grades from the marksheet table.

12.	Display the maximum and minimum marks for Sub101 using design.
13.	Display the sum of marks for Sub102 using SQL command
14.	Display the rollno, student name and percentage whose name starts with A using SQL command.
15.	Display the rollno, student name and percentage whose name second letter is i using SQL command

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