# As per NEP 2020

# B.A./B.Com./B.Sc. Computer Application

**(Effective from Academic Year 2024-2025 onwards)**

शेखावाटी विश्वविद्यालय
Shekhawati University

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**(CBCS) As per the NEP 2020 (Semester I to IV)**
**W.e.f. the Academic Session 2024-25**
**Discipline: Computer Application**
**Faculty: Arts/Commerce/Science**

| Semester | Course title | Credits | Course Code | Credit distribution of the course | | | Eligibility criteria |
|---|---|---|---|---|---|---|---|
| | | | | Lecture | Tutorial | Practical/ Practice | |
| I | Computer Fundamentals & PC software | 3 | 24BCS5101T | 3 | 0 | 0 | 10+2 from any recognized Board |
| I | Computer Fundamentals & PC Software Lab | 1 | 24BCS5101P | 0 | 0 | 1 | |
| II | Programming with C | 3 | 24BCS5201T | 3 | 0 | 0 | |
| II | Programming with C Lab | 1 | 24BCS5201P | 0 | 0 | 1 | |
| III | Database Management System | 3 | 24BCS6301T | 3 | 0 | 0 | |
| III | DBMS Lab | 1 | 24BCS6301P | 0 | 0 | 1 | |
| IV | Internet & Web Programming | 3 | 24BCS6401T | 3 | 0 | 0 | |
| IV | Internet & Web Programming Lab | 1 | 24BCS6401P | 0 | 0 | 1 | |

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**(CBCS) As per the NEP 2020 (Semester I to IV)**
**W.e.f. the Academic Session 2024-25**
**Discipline: Computer Application**

# Semester I

| Course Title: | Computer Fundamentals & PC software | Course Code: 24BCS5101T |
|---|---|---|
| Total Lecture hour 52 | | Hours |
| Unit I | Evolution and generations of Computers, Characteristics of computer, Classification of Computer, Modern Computer & its Application; Block diagram and Components of Computer System, Central Processing Unit, Memory Unit, memory hierarchy, Microprocessor; Interconnecting the Units of a Computer, Inside a Computer Cabinet; Start- up Process (Booting), Specification of a Desktop and Laptop currently available in the market (Processor, motherboard, memory, interface & capacity of HDD & DVD drives, I/O ports etc). | 10 |
| Unit II | Software and Hardware: Meaning and definition of software & hardware, relations between software & hardware, Need & Types of Software: System & Application software: Open source software's concept and examples, hardware- all input devices, all output devices and all other physical parts of the computer. Programming Languages: Machine, Assembly, High Level, 4GLs, Translators: Assemblers, Compilers and Interpreter;<br>Operating system: Objectives of Operating System, Basic OS functions, resource abstraction, types of operating systems- multiprogramming systems, batch systems, time sharing systems; operating systems for personal computers & workstations, process control & real time systems, Concept of CUI & GUI | 14 |
| Unit III | Features of Word Processor: Create, edit, store, print documents, Navigation of documents. cut, copy & paste, Find & replace, Different Page Views and layouts, Alignment, formatting features, Tabs & Indents, Inserting tables, pictures, hyperlinks, Spell checking, Macros, Mail merge, Template, Wizards, Overview of Index and Tables. Importing and exporting to and from various formats. | 13 |
| Unit IV | Features of Spreadsheet: Creating, saving, editing, moving around a worksheet, workbook; Inserting, deleting navigation in worksheets, Working with Formula, Cell reference, Functions (Financial, Database, Maths, Trigonometric, Statistical etc); Creating, editing, selecting and naming range. Format Feature, Changing alignment, Character styles, Date Format, Border & Colors etc. Previewing & Printing a worksheet, Pivot Table, Creating Charts & Graphs.<br>PowerPoint Presentation Package: Creating Presentation, Different presentation templates,<br>Setting backgrounds, layouts, Customizing, Formatting a presentation, Adding Graphics and<br>effects to the presentation. | 15 |

| Reference Books: | |
|---|---|
| 1 | Computer Fundamental By P.K. Sinha (BPB Publications) |
| 2 | Upgrading and Repairing PCs By Scott and Mueller, Techmedia, New Delhi |
| 3 | Rapidex MS Office By Vikas Gupta (Pustak Mahal) |
| 4 | Absolute Beginners Guide to Computer Basics By Miller M, Pearson Education. |
| 5 | Fundamentals of Computers By Balagurusamy E, Tata McGraw-Hill By Wiley INDIA |
| | |

| Course Title: | Computer Fundamentals Lab & PC Software Lab | Course Code: 24BCS5101P |
|---|---|---|
| | 1. Document Formatting: Create a document with text formatting (bold, italic, underline, font size, and color).<br>2. Table Insertion: Insert a table with 4 columns and 5 rows. Apply different styles to the table.<br>3. Page Layout: Adjust margins, page orientation (portrait/landscape), and add page numbers.<br>4. Bullets and Numbering: Create a bulleted and numbered list for a to-do task.<br>5. Header and Footer: Add a custom header with your name and a footer with the current date.<br>6. Basic Calculations: Create a spreadsheet that calculates the sum, average, and product of a list of numbers.<br>7. Formatting Cells: Apply cell borders, background color, and change the font style for specific rows/columns.<br>8. Conditional Formatting: Highlight cells with values greater than 50 in a dataset using conditional formatting.<br>9. Charts: Create a bar chart and pie chart from a list of values and customize the chart title and labels.<br>10. Basic Functions: Use the `SUM()`, `AVERAGE()`, and `IF()` functions in a spreadsheet.<br>11. Slide Design: Create a presentation with 5 slides, each having a different design and layout.<br>12. Animations and Transitions: Apply animations to text and transitions between slides.<br>13. Inserting Media: Add an image, a video clip, and a sound clip to a slide.<br>14. Slide Master: Use Slide Master to apply a consistent background and header to all slides.<br>15. Presentation Timing: Set automatic slide timing for a slideshow of 2 seconds per slide. | |

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# Semester II

| Course Title: | Programming with C | Course Code: 24BCS5201T |
|---|---|---|
| **Total Lecture hour 52** | | **Hours** |
| **Unit I** | Basic concepts of programming: Characteristic & Implementation of Algorithm, Flow Chart Symbols, Benefit and Limitations; Decision Table, Pseudo Code. Programming Techniques: Top down, Bottom up, Modular, Structured, Features, Merits, Demerits and their Comparative study. | **12** |
| **Unit II** | Structure of C Program; Character Set, Tokens, Variable, Constant; Data Types; Operator, Expressions, Type Conversions; Console Input-Output functions; Control Flow Statements and Blocks, Branching statements and Labels. | **13** |
| **Unit III** | Loop Structure: While, Do while, For, Modular programming: Basic types of function, Declaration and definition, Function call, Parameter passing, Recursion, Scope of variables. Arrays: Declaration and use of Array, Array manipulation; Searching, Insertion, Deletion of an element, Strings as array of characters, Standard library string functions. | **13** |
| **Unit IV** | Pointer: Declaring & Initializing pointers, Accessing a variable and address of a variable,Pointer expressions, Pointers and Function Arguments, Pointers and Arrays. Structure, Union: Declaration and use. Programs to show the use of structure, union; Concept of Files, Basic Functions for File Handling, Basic Input/Output operations on files. | **14** |
| **Reference Books:** | | |
| 1 | Programming In C By Gottfried (Tata McGraw Hill) | |
| 2 | C Programming Language By Kernighan (Prentice Hall Of India) | |
| 3 | C Programming By R.B. Patel, Khanna Publication. | |
| 4 | Let Us C By Yashwant Kanetkar (BPB Publication) | |
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| Course Title: | Programming with C Lab | Course Code: 24BCS5201P |
|---|---|---|
| | 1. Write a program to input a number and print it.<br>2. Write a program to take two numbers as input and print their sum.<br>3. Write a program to check if a number is even or odd.<br>4. Write a program to find the largest of two numbers entered by the user.<br>5. Write a program to implement a simple calculator that performs addition, subtraction, multiplication, and division.<br>6. Write a program to find the factorial of a number using a loop.<br>7. Write a program to input a number and reverse it.<br>8. Write a program to print the Fibonacci series up to `n` terms.<br>9. Write a program to check if a number is prime or not. | |

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| | 1. 10.Write a program to find the sum of the digits of a given number.<br>10. Write a program to swap two numbers without using a third variable.<br>11. Write a program to check if a given number or string is a palindrome.<br>12. write a program to take 5 integers as input and display them using an array.<br>13. Write a program to find the largest element in an array of `n` integers.<br>**14.** Write a program to find the transpose of a 2x2 matrix. |

# Semester III

| **Course Title:** | **Database Management System** | **Course Code: 24BCS6301T** |
|---|---|---|
| **Total Lecture hour 52** | | **Hours** |
| **Unit I** | **Introduction to Databases**:- Data and Data Processing, Merits and Demerits of File,Organization, Database Overview Purpose of Database Systems, File Systems vs. Database Systems, View of Data, Data Abstraction, Instances, Schema, Data Models:- Overview of Network, Hierarchical, and Relational Models, Database Architecture and Administrators, Codd's Rules. | **13** |
| **Unit II** | **Entity-Relationship Model and Normalization**:- ER Model: Basic Terminology, Entity, Entity Sets, Attributes, and Keys, Relation and Relationship Sets, Entity-Relationship Diagram, Weak and Strong Entity Types, Features of the E-R Model, Specialization, Generalization, Aggregation, Creating Tables from ER Diagrams, Basic Concept of Normalization (up to BCNF) | **14** |
| **Unit III** | **Introduction to Access and Database Concepts**, Creating Tables and Data Types, Entering Data and Table Design, Indexing and Importing Data, Using Operators and Expressions, Access Functions, Importing and Exporting Data, Creating Queries, Setting Relationships Between Tables, Creating Forms, Form Controls and Components, Creating and Printing Reports. | **14** |
| **Unit IV** | **Query Languages and Transaction Management**:- Query Languages, DDL, DML, DCL, Introduction to SQL, Data Types, Basic SQL Commands (Create, Alter, Drop, Truncate, Insert, Update, Delete), Basic SQL Queries: Union, Intersect, and Except, Nested Queries, Transaction Management, ACID Properties, Serializability, and Concurrency Control, Lock-Based Concurrency Control (2PL, Deadlocks), Timestamping Methods and Optimistic Methods, Database Recovery Management | **11** |
| **Reference Books:** | | |
| 1 | An Introduction to Database System By C.J. Date (Addision Wesley) | |
| 2 | Database Management System By A. Silberschatz, Henry F.Korth, S. | |

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| | Sudershan (McGraw-Hill) |
| 3 | Fundamentals of DBMS By Gupta, Dhillon, Magho, Sharma (Lakhanpal Publishers) |
| 4 | Teach yourself Access. Sieglel, BPB |
| 5 | Introduction to Computer Data Processing and System Analysis By V K Kapoor (Sultan Chand and Sons) |

| Course Title: | Database Management System Lab | Course Code: 24BCS6301P |
|---|---|---|

1. Create a database: Design a database named "School" with the following tables: `Students`, `Courses`, and `Enrollments`. Each table should have appropriate fields and relationships.
2. Insert records: Write an SQL query to insert 5 student records into the `Students` table with fields like `StudentID`, `Name`, `Age`, and `Class`.
3. Select query: Write an SQL query to retrieve all records from the `Students` table where the age is greater than 18.
4. Update query: Write an SQL query to update the `Name` of a student where the `StudentID` is 102.
5. Delete query: Write an SQL query to delete records from the `Students` table where the `Age` is less than 10.
6. Create table: Using SQL in Microsoft Access, create a table named `Teachers` with fields such as `Teacher ID`, `Name`, `Subject`, and `Experience`.
7. Inner join: Write an SQL query to perform an inner join between the `Students` and `Enrollments` tables to display student names along with their enrolled courses.
8. Left join: Write an SQL query to perform a left join between the `Courses` and `Enrollments` tables to display all courses and the students enrolled (if any).
9. Group by: Write an SQL query to group students by `Class` and count how many students are there in each class.
10. Aggregate functions: Write an SQL query to calculate the average age of students in the `Students` table.
11. Order by: Write an SQL query to display all records from the `Courses` table ordered by `CourseName` in ascending order.
12. Having clause: Write an SQL query to find all courses that have more than 5 students enrolled using the `HAVING` clause.
13. Distinct query: Write an SQL query to fetch distinct course names from the `Enrollments` table.
14. Between clause: Write an SQL query to retrieve all students whose age is between 15 and 20.
15. Like operator: Write an SQL query to display all students whose name starts with 'A'.
16. Count function: Write an SQL query to count how many students are enrolled in each course.
17. Primary key constraint: Create a table named `Departments` and define `Department ID` as the primary key.
18. Foreign key constraint: Alter the `Enrollments` table to add a foreign key referencing the `Student ID` from the `Students` table.

# Semester IV

| Course Title: | Internet & Web Programming | Course Code: 24BCS6401T |
|---|---|---|
| Total Lecture hour 52 | | Hours |
| Unit I | Data Communication, Networking & Internet:- Data Communication,Transmission Media, Coaxial, UTP, Optical Fiber, Wireless, Components of Computer Networks, Transmission Modes Simplex, Half Duplex, Full Duplex, Network Types LAN, MAN, WAN, Network Models, The OSI Model, TCP/IP, Evolution of the Internet,Basic Internet Terms: Client, Server, MODEM, Web Page, Website, Home Page, Browser, URL, ISP, Web Server, Download & Upload, Online & Offline, Internet Applications:Remote Login, VoIP, Video Conferencing, Audio-Video Streaming, Chatting. E-Mail Advantages, How It Works, Anatomy of an E-Mail Message, Basics of Sending and Receiving, E-Mail Protocol. | 14 |
| Unit II | Introduction to HTML- Definition, history, and importance of HTML, Basic document structure (syntax, tags, attributes), Development environment setup (text editors and browsers), Basic HTML Elements,Text formatting (headings, paragraphs, lists), Creating hyperlinks (anchor tags), Introduction to images (img tag), Multimedia and Tables, Embedding audio and video,Creating and styling tables (table, tr, td), Forms and Input Elements, Creating forms (form tag, input types), Using labels, fieldsets, and legends, Basic HTML5 form validation, Advanced HTML Features Semantic HTML (header, footer, article),HTML5 features (canvas, geolocation, web storage), Meta tags and SEO importance | 12 |
| Unit III | Introduction to CSS, Definition and Importance of CSS, CSS Syntax (Selectors, Properties, Values), Including CSS in HTML (Inline, Internal, External), CSS Selectors and Properties, Basic Selectors (Universal, Type, Class, ID), Combinators (Descendant, Child, Adjacent Sibling), Pseudo-classes and Pseudo-elements, CSS Box Model, Understanding the Box Model (Margin, Border, Padding, Content), Box Sizing (content-box vs. border-box), Display Property (block, inline, inline-block), Layout Techniques, Positioning (static, relative, absolute, fixed, sticky), Flexbox Basics (flex container and items),Grid Layout Introduction, Styling Text and Backgrounds, Introduction to JavaScript, Operators and Control Structures,Functions and Scope, Function Declaration and Expression, Parameters and Return Values, DOM Manipulation, Events, Arrays and Objects. | 14 |
| Unit IV | Introduction to Cyber Security, Types of Cyber Threats, malware, phishing, ransomware, viruses, and hacking, Basic Cryptography, Network Security, firewalls, VPNs, and basic network protection methods, Security Tools and Software antivirus software, firewalls, and anti-malware applications, User Authentication and Access Control, passwords, two-factor authentication (2FA), and access management, Cyber Security Best Practices safe browsing, | 13 |

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| | secure file sharing, and email protection, Social Engineering and Phishing Attacks Data Backup and Recovery. | |
| **Reference Books:** | | |
| 1 | Internet and Web Page Designing By V.K Jain (BPB) | |
| 2 | Internet & Web Design By A. Mansoor, Pragya Publications. | |
| 3 | Web Enabled Commercial Application Development Using HTML, DHTML , java script, Perl CGI By Ivan Bayross (BPB) | |
| 4 | Cyber Security by Nina Godbole & Sunit Belapure | |
| 5 | Computer Forensics by Marie- Helen Maras | |

| **Course Title:** | **Internet & Web Programming Lab** | **Course Code: 24BCS6401P** |
|---|---|---|
| | 1. Create a simple webpage that displays a heading, paragraph, and an image.<br>2. Build a navigation bar using an unordered list, with three links to different sections of the same page.<br>3. Design a form with input fields for first name, last name, email, and a submit button.<br>4. Create a webpage with two sections, one with a background color and the other with a background image.<br>5. Style a paragraph to have a different font, font size, and text color using CSS.<br>6. Create a table with three rows and two columns, and style the table using CSS.<br>7. Develop a webpage with a form that includes a dropdown menu and radio buttons.<br>8. Design a webpage that has three buttons with different background colors and text colors.<br>9. Create a webpage with a heading and paragraph. Use CSS to align the text in the center.<br>10. Build a webpage with an ordered list and unordered list, both styled with different colors and fonts.<br>11. Design a webpage with two divisions (div) side by side using CSS Flexbox.<br>12. Create an HTML page that uses an external CSS file for styling.<br>13. Build a webpage with a footer and header section, both styled with different background colors.<br>14. Create a form that has text input, password input, and a submit button, and style the form with CSS.<br>15. Design a webpage with two paragraphs. Apply different margin and padding properties to each paragraph.<br>16. Create a webpage with an image gallery of three images aligned horizontally using CSS.<br>17. Develop a webpage that changes the background color when hovering over a button.<br>18. Build a webpage that contains a video element and a styled caption below it. | |

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