

B. C. A.
Semester-II

L-4 T-0 P-0 C-4

25BCA050T : Problem Solving with C Programming

Course Objectives

- To know the basic concepts of pointers.
- To learn about structures in C programming.
- To learn and practice the C preprocessor.
- To know file handling.
- To learn about formatted input/output.

Course Outcomes

1. Understand the concepts of pointers.
2. Apply the concept of structures in C programming.
3. Analyze the C preprocessor.
4. Evaluate the strengths of file handling.
5. Create a program for probabilistic reasoning with formatted input/output.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	1	3	-	-	-	-	-	-	-	-	-	-
CO2	-	1	3	-	-	-	-	-	2	-	-	-
CO3	-	1	2	3	-	-	1	-	-	-	-	-
CO4	-	-	2	1	3	-	-	-	-	-	-	-
CO5	-	1	2	-	-	3	-	-	-	-	-	-

indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

High-3 Medium-2 Low-1

Unit-I:Pointer:

12 Hours

Pointer: Definition of pointer, Pointer declaration, Using & and * operators. Void pointer, Pointer to pointer, Pointer in math expression, Pointer arithmetic, Pointer comparison, Dynamic memory allocation functions — malloc, calloc, realloc and free, Pointer vs. Array, Array of pointer, Pointer to array, Pointers to function, Function returning pointer, Passing function as Argument to function.

Unit-II: Structure:

12 Hours

Introduction, Defining a structure, declaring structure variables, accessing structure members, structure initialization, array of structures, structure within structure, passing structure to function, function returning structure, Pointer to structure, Dynamic array of structure through pointer to structure.,self referential structure.

Unit-III: C preprocessor:

12 Hours

Basics, #Include, #define, #undef, conditional compilation directive like #if, #else, #elif, #endif, #ifdef and #ifndef; Variable argument list functions.

Unit-IV:File Handling:

12 Hours

File: Introduction, Opening, Closing, reading and writing of files. Seeking forward and backward. Examples of file operation programs, input/output and Error Handling on Files.

Unit-V: Formatted input output:**12 Hours**

Introduction to Formatted Input/Output, printf() Function, scanf() Function, Format Specifiers and Modifiers, Escape Sequences and Special Characters, Field Width and Precision Control, File Input/Output with Formatted I/O, Error Handling and Limitations, Advanced Formatting Techniques, Practice and Application

Total Hours: 60**Reference Books:**

1. Kerninghan & Richie: The C Programming language, PHI
2. Cooper Mullish: The Spirit of C, Jaico Publishing House, Delhi
3. Kanetkar Y: Let us C
4. Kanetkar Y: Pointers in C.

List of e-Learning Resources:

1. <https://nptel.ac.in/>
2. <https://www.coursera.org/>

Prepared By**Academic
Coordinator****HOD****Senior Faculty
nominated by DOAA**

B. C. A.
Semester-II

L-4 T-0 P-0 C-4

25BCA060T : Web Technology

Course Objectives

- To learn the basic concepts of web design and create effective web pages.
- To learn about basic and advanced tags of HTML.
- To learn and practice using HTML5 tags.
- To grasp CSS concepts and understand how to apply them in web design.
- To gain knowledge about the Bootstrap framework.

Course Outcomes Students will be able

1. Understand the concepts of Internet technology.
2. Apply the principles of static web page development effectively.
3. Analyze the concepts of HTML5.
4. Evaluate the strengths and weaknesses of dynamic web page development.
5. Create a responsive website using Bootstrap.

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	1	3	-	-	2	-	-	-	-	-	-	-
CO2	2	1	3	-	-	-	-	-	2	-	-	-
CO3	-	-	2	3	-	-	1	-	-	-	-	-
CO4	2	1	-	-	3	-	-	-	-	-	-	-
CO5	-	2	-	1	-	3	-	-	-	-	-	-

High-3 Medium-2 Low-1

Unit-I: Introduction to Internet Technology:

12 Hours

History of the internet, internetworking concepts, architecture, and protocol: TCP/IP and others main protocols, internet address and domains. World Wide Web (WWW), Web Clients, Web Servers, HyperText Transfer Protocol (Http), feature of HTTP protocol, HTTP request response model, HyperText Transfer Protocol Secure (HTTPS), proxy server, Firewall.

Unit-II: Static Web page Development:

12 Hours

Introduction to HyperText Markup Language (HTML), Elements of HTML, Basic structure of an HTML, document Head & Body Sections, inserting texts, Text alignment, using images in pages, Hyperlinks text, Backgrounds and Color controls, creating and using Tables in HTML, Creating Lists: Ordered List Tags, Unordered List Tag. Changing the Font Color; Marquee Tag.

Unit-III: Introduction to HTML5:

12 Hours

Basics and advantages.**Structure:** Semantic and non-semantic elements.**Text Markup:** Headings, paragraphs, lists, emphasis.**Links and Images:** Creating links and inserting images.**Forms:** Creating forms and form elements.**Multimedia:** Embedding audio, video, canvas, and SVG.**APIs:** Geolocation, Storage, Drag and Drop.**Responsive Design:** Principles and media queries.**Advanced Topics:** Validation.

Unit-IV: Dynamic Web page Development:

12 Hours

Cascading Style Sheet: CSS, Defining Style with HTML Tags, Features of Style Sheet, Style Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with Lists and Tables, Style placement: Inline style, Span & div tags, header styles.CSS Id and Class Working with block elements and objects, CSS Color.

Unit-V: -Introduction to Bootstrap:

12 Hours

History of Bootstrap, Overview and benefits, Features of Bootstrap, Learn Setup, Responsive Design, Utilities, Grid System, Components, Interactive Features, JavaScript Plugins.

Total Hours: 60

Reference Books:

1. HTML and Web designing - Kris Jamsa and Konrad King
2. Web Technology - N.P. Goplan, J. Akilandeswari
3. Internet Technology and Web Design - ISRD Group

List of e-Learning Resources:

1. <https://nptel.ac.in/>
2. <https://www.coursera.org/>

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Semester-II

L-4 T-0 P-0 C-4

25BCA070T: Operating System

Course Objectives

Course Outcomes (COs)

- Describe the importance of computer system resources and the role of operating systems in their management policies and algorithms.
- Specify objectives of modern operating systems and describe how operating systems have evolved over time.
- Understand various process management concepts and can compare various scheduling techniques, synchronization, and deadlocks.
- Describe the concepts of memory management techniques.
- Identify the best suited process management technique for any process.
- Describe various file operations, file allocation methods and disk space management.
- To understand and identify potential threats to operating systems and the security features to guard against them.
- Learn to operate the Linux system

Articulation Matrix

CO/PO/PS O	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PSO 1	PSO 2
CO1								
CO2								
CO3								
CO4								
CO5								

High-3 Medium-2 Low-1

Unit-I

12 Hours

Introduction to Operating System: What is Operating System? History and Evolution of OS, Basic OS functions, Resource Abstraction, Types of Operating Systems— Batch Systems, Multiprogramming Systems, Multiprocessing Systems, Time Sharing Systems, Distributed OS, Real time systems.

Unit-II

12 Hours

Process Management: Process Concepts, Process states & Process Control Block.

Process Scheduling: Scheduling Criteria, Scheduling Algorithms (Preemptive & Non-Preemptive FCFS, SJF, SRTN, RR).

Deadlock - Definition, Deadlock Characterization, Necessary and Sufficient Conditions for Deadlock.

Deadlock Handling Approaches: Prevention, Avoidance, Detection and Recovery

Unit-III

12 Hours

Memory Management: Introduction, Address Binding, Logical versus Physical Address Space, Swapping, Contiguous & Non-Contiguous Allocation, Fragmentation (Internal & External), Compaction, Paging, Segmentation, Virtual Memory,

File Management: Concept of File System (File Attributes, Operations, Types), Functions of File System, Types of File System, Access Methods (Sequential, Direct & other methods), Directory Structure (Single-Level, Two-Level, Tree-Structured)

Unit-IV

12 Hours

Disk Management: Structure, Disk Scheduling Algorithms (FCFS, SSTF, SCAN, C-SCAN, LOOK), Disk Reliability, Recovery.

Security: Security Threats, Security policy mechanism, Protection, Trusted Systems, Authentication and Internal Access Authorization, Windows Security

Unit-V

12 Hours

LINUX: Introduction, History and features of Linux, advantages, hardware requirements for installation, Linux architecture, file system of Linux - boot block, super block, inode table, data blocks.

Linux standard directories, Linux kernel, Partitioning the hard drive for Linux, installing the Linux system, system - startup and shut-down process, init and run levels.

Total: 60 Hours

Textbooks:

- A Silberschatz, P.B. Galvin, G. Gagne, Operating Systems Concepts, 8th Edition, John Wiley Publications.
- A.S. Tanenbaum, Modern Operating Systems, 3rd Edition, Pearson Education.
- Operating System by Peterson
- Linux by Sumitabh Das

Reference Books:

- G. Nutt, Operating Systems: A Modern Perspective, 2nd Edition Pearson Education.
- W. Stallings, Operating Systems, Internals & Design Principles, 8th Edition, Pearson Education.
- M. Milenkovic, Operating Systems- Concepts and design, Tata McGraw Hill.
- Operating System design and Concepts by Milan Milenkovic.

Mandsaur University
Department Of Allied Science



Syllabus to be offered at BCA (CC & SACS), BLib,
25ALS110T : Environmental Studies

Sem. – II

L-2 T-0 P-0 C-2

Course Objective:

- To this course introduces students to environment concerns.
- To learn about environment and factors affecting it.
- To acquire environmental ethics and its protection.
- To acquire knowledge of the natural system and its correlation with the living world

Course Outcomes (COs)

1. Understand the natural environment and its sources.
2. Understand the ecosystem and biodiversity.
3. Apply knowledge of various types of pollution
4. Apply the concepts of legally environmental protection
5. Analyze the principles and components of green building design, including energy efficiency, water conservation, and materials selection.

Articulation Matrix (For BCA)

CO/PO/PSO	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PSO 1	PSO 2
CO1	1	2	2	2	3	2	3	3	2	3	-	-
CO2	1	2	2	2	2	2	3	2	2	3	-	-
CO3	1	1	2	3	2	2	3	3	2	3	-	1
CO4	1	1	2	3	3	2	3	3	2	3	-	-
CO5	1	1	2	3	2	2	3	3	2	1	-	2

High-3 Medium-2 Low-1

Articulation Matrix (For B.Lib.)

CO/PO/PSO	PO 1	PO 2	PO 3	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	1	-	2	-	1	2	-	-
CO2	1	-	2	-	1	2	-	-
CO3	1	-	2	-	-	2	-	-
CO4	1	-	2	-	1	2	-	-
CO5	1	-	2	-	1	2	-	-

High-3 Medium-2 Low-1

Unit- I Environment and Natural Resources:

5 Hours

- Multidisciplinary nature, Scope and Importance of Environment
- Components of Environment: Atmosphere, Hydrosphere, Lithosphere, and Biosphere.
- Brief account of Natural Resources and associated problems: Land Resource, Water Resource, Energy Resource
 - Concept of Sustainability and Sustainable Development

Unit- II Ecosystem and Biodiversity:

5 Hours

- Ecosystem: Structure function and types their Preservation & Restoration

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Department Of Allied Science

- Biodiversity and its conservation practices.

Unit- III Environmental Pollution

5 Hours

- Pollution: Types, Control measures, Management and associated problems.
- Deforestation
- Domestic and global environmental concerns
- Soil salination

Unit -IV Environmental laws & legislations

5 Hours

- Environmental Law and Legislation: Protection and conservation Acts.
- International Agreement & Programme.
- Environmental Movements, communication and public awareness programme.
- National and International organizations related to environment conservation and monitoring

Unit -V Sustainable habitat, industrialization and urbanization

10 Hours

(A)

- Concept of green building
- volatile organic compounds (VOCs)
- GRIHA rating and LEED rating
- Green business, green computing, E-waste management

(B) Suggested activities: (at least one)

1. Case Studies: Present real-world environmental case studies for students to analyze and discuss. Examples could include environmental disasters, environmental justice issues, or successful conservation projects.
2. Industrial Visit to a local polluted site Urban / Rural/ Industrial / Agricultural /Treatment plant (drinking water or waste water)
3. Study of simple ecosystem.
4. Study of BSI and WHO Standards/ Specification for drinking water.

Total: 30 Hours

References

1. Rajagopalan, R. (2011). *Environmental Studies*. Oxford IBH Pub
2. Kogent Learning Solutions Inc. (2012). *Energy, Environment, Ecology and Society*. Dreamtech.
3. Odum, E. P. (1971). *Fundamentals of Ecology*. Philadelphia: Saunders.
4. Centre for Science and Environment. (2021). *Climate Change: Science and Politics*. New Delhi.
5. Rosencranz, A., Divan, S., & Noble, M. L. (2001). *Environmental law and policy in India*.
6. Kaushik, A., & Kaushik, C. P. (2018). *Perspectives in Environmental Studies*. New Age International Publishers.

List of e-Learning Resources:

1. <https://nptel.ac.in/courses/122/102/122102006/>
2. <https://nptel.ac.in/courses/105/102/105102089/>
3. <https://www.nature.com>
4. IntroductiontoEnviroronentalLawandPolicy(coursera)
5. OurEarth:It'sClimate,History,andProcesses(coursera)

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B. C. A.
Semester-II

L-0 T-0 P-4 C-2

25BCA050P : Problem Solving with C Programming Lab

Course Objectives

- To know about basic concepts of Pointer.
- To learn about Structure in c programming.
- To learn and practice C preprocessor.
- To know about File Handling.
- To know about formatted input output.

Course Outcomes

1. Understand the concepts of Pointer
2. Apply the structure concept in c programming
3. Analyze C preprocessor
4. Evaluate the strengths of File Handling
5. Create probabilistic reasoning program with Formatted input output

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

CO/PO/PSO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PSO1	PSO2
CO1	2	3	-	-	-	-	-	-	-	-	-	-
CO2	-	2	3	-	-	-	-	-	2	-	-	-
CO3	-	1	2	3	-	-	1	-	-	-	-	-
CO4	1	-	2	-	3	-	-	-	-	-	-	-
CO5	-	1	-	2	-	3	-	-	-	-	-	-

High-3 Medium-2 Low-1

Unit 1: Pointers and Dynamic Memory Allocation

12 Hours

Pointers and their usage in C, Dynamic Memory Allocation with malloc, calloc, and free, Pointer Arithmetic and Dereferencing, Using Pointers to Store and Manipulate Data.

Unit 2: Structures in C

12 Hours

Introduction to Structures in C, Initializing Structures, Accessing Structure Members
Nested Structures, Arrays of Structures, Passing Structures to Functions, Structures with Pointers.

Unit 3: Functions and Operations on Structures

12 Hours

Functions for Manipulating Structures, Calculating Average or Total Values from Structures, Searching and Sorting Structures, Modifying Structure Members, Using Functions to Perform Operations on Arrays of Structures.

Unit 4: Arrays of Structure

12 Hours

Arrays of Structures

Unit 5: File Operations and Formatting

12 Hours

Basics of file input and output, Creating, reading, writing, and appending data to files, Formatted input and output using printf, scanf, fprintf, and fscanf.

List of Experiments

1. Create a C program to store and display student names using pointers.
2. Create a C program to store and display employee names using pointers.
3. Create a C program to store and display product names using pointers.
4. Devise a solution in C using pointers to dynamically allocate memory for student data.
5. Devise a solution in C using pointers to dynamically allocate memory for employee data.
6. Devise a solution in C using pointers to dynamically allocate memory for product data.
7. Develop a C program using malloc to allocate memory for storing student names.
8. Develop a C program using malloc to allocate memory for storing employee names.
9. Develop a C program using malloc to allocate memory for storing product names.
10. Design a simple method to initialize structures in C for storing basic information.
11. Propose an easy method to initialize structures in C for storing employee details.
12. Propose an easy method to initialize structures in C for storing product details.
13. Design a structure in C to represent basic student details like name, age, and grade.
14. Design a structure in C to represent basic employee information like name, salary, and department.
15. Design a structure in C to represent basic product information like name, price, and quantity.
16. Develop a program in C to update and display structure members like student grades.
17. Invent a program in C to update and display structure members like employee salaries.
18. Invent a program in C to update and display structure members like product prices.
19. Write a function in C to calculate the average grade of students.
20. Invent a C function to determine if a student's grade qualifies them for an award.
21. Write a function in C to determine the total salary expense for a department.
22. Invent a C function to find the employee with the highest salary in a department.
23. Write a function in C to calculate the total revenue generated from product sales.
24. Invent a C function to find the product with the highest price in a list.
25. Create a C program to manage a list of student names using arrays of structures.
26. Develop a C program to manage a list of employee names using arrays of structures.
27. Develop a C program to manage a list of product names using arrays of structures.
28. Write a program to demonstrate the use of format specifiers %d, %f, %c, and %s with different types of inputs.
29. Write a program to create a file and write a user-input string to it.
30. Create a program to read the contents of an existing text file and display it on the console.

Total Hours 60

Reference Books:

1. Principles of Soft Computing, by S.N. Deepa S.N. Sivanandam
2. Russell, Stuart and Norvig, Peter, “Artificial Intelligence: A Modern Approach”.
3. Spivey, Michael, “An Introduction to Logic Programming”.
4. Weizenbaum, Joseph, “Computer power and human reason”.
5. Elaine Rich and Kevin Knight, “Artificial Intelligence”.
6. Dan W. Patterson, “Introduction to Artificial Intelligence and Expert Systems”.

List of e-Learning Resources:

1. <https://nptel.ac.in/>
2. <https://www.coursera.org/>

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Semester-II

L-0 T-0 P-4 C-2

25BCA060P: Web Technology Lab

Course Objectives

- To know about basic concepts of Web and learn to design effective web pages.
- To learn about basic and advanced tags of HTML.
- To learn and practice HTML5 tags.
- To know about CSS concepts.
- To know about Bootstrap.

Course Outcomes Students will be able to

1. Understand the concepts of internet Technology
2. Apply the useful static Web page Development
3. Analyze the concept HTML5
4. Evaluate the strengths and weaknesses of Dynamic Web page Development
5. Create a responsive website using Bootstrap

Articulation Matrix

(Program Articulation Matrix is formed by the strength of correlation of COs with POs and PSOs. The strength of correlation is indicated as 3 for substantial (high), 2 for moderate (medium) correlation, and 1 for slight (low) correlation)

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CO2	-	2	3	-	-	-	-	-	2	-	-	-
CO3	-	1	2	3	-	-	1	-	-	-	-	-
CO4	1	-	2	-	3	-	-	-	-	-	-	-
CO5	-	1	-	2	-	3	-	-	-	-	-	-

High-3 Medium-2 Low-1

Unit 1: HTML Basics and Structure

12 Hours

Introduction to HTML, Text Formatting and Structure, Hyperlinks and Anchors, Images and Media, Tables in HTML

Unit 2: CSS (Cascading Style Sheets)

12 Hours

Introduction to CSS, Styling Text and Elements, Layout Design and Box Model, Backgrounds and Borders, Advanced CSS Styling

Unit 3: JavaScript Basics

12 Hours

Introduction to JavaScript, DOM Manipulation, Form Validation, JavaScript Alerts and Prompts

Unit 4: Advanced HTML and CSS

12 Hours

Responsive Design Principles, CSS Flexbox and Grid Layouts, Using CSS for Animations and Transitions, Working with Fonts and Icons, Introduction to Bootstrap, Grid System in Bootstrap.

Unit 5: Web Forms and Databases

12 Hours

Creating and Styling Web Forms, Form Validation with JavaScript , Connecting Forms to Databases, Login and Authentication Systems.

List of Experiments

1. Create a webpage with HTML describing your department. Use paragraph and list tags.
2. Create links on the words e.g., “Wi-Fi” and “LAN” to link them to Wikipedia pages.
3. Insert an image and create a link such that clicking on the image takes the user to another page.
4. Change the background color of the page. At the bottom create a link to take the user to the top of the page.
5. Create a table to show your class time-table.
6. Use tables to provide layout to your HTML page describing your university infrastructure.
7. Use `` and `<div>` tags to provide a layout to the above page instead of a table layout.
8. Use frames such that the page is divided into 3 frames 20% on left to show contents of pages, 60% in center to show body of page, remaining on right to show remarks.
9. Embed Audio and Video into your HTML web page.
10. Apply in-line CSS to change colors of certain text portions, bold, underline and italics certain words in your HTML web page. Also change the background color of each Paragraph using in-line CSS.
11. Write all the above styling in CSS in different files (.css) and link it to your webpage such that changes made in CSS file are immediately reflected on the page. Group Paragraphs into a single class and add styling information to the class in CSS.
12. Create a simple form to submit user input like his name, age, address and favorite subject, movie and singer.
13. Add form elements such as radio buttons, check boxes and password fields. Add a submit button.
14. Design a web page in bootstrap for shopping websites.
15. Make a navigation bar in bootstrap.
16. Make an image slider in bootstrap.
17. Create a form in HTML and put validation checks on values entered by the user using JavaScript (such as age should be a value between 1 and 150).

18. Write a JavaScript program to display an information box as soon as page loads.
19. Write a JavaScript program to change background color after 5 seconds of page load.
20. Write a JavaScript program to dynamically bold, italic and underline words and phrases based on user actions.
21. Write a JavaScript program to display a hidden div.
22. Using ideas from the above experiments, try to create a website for your department.
23. Create an e-book having the left side of the page name of the chapters and right side of the page the contents of the chapters clicked on the left side.
24. Create login and form and connect it with the database.
25. Create a simple web page layout using Bootstrap that includes a navigation bar, a header with a large heading, and a section with three columns containing images and captions.
26. Design a responsive form using Bootstrap with fields for name, email, and message, along with a submit button.
27. Develop a carousel/slider using Bootstrap to showcase multiple images with navigation arrows and indicators.
28. Develop a responsive navbar with dropdown menus using Bootstrap for easy navigation on both desktop and mobile devices.
29. Create a responsive grid layout using Bootstrap to display a gallery of images, ensuring they adjust appropriately based on screen size.
30. Utilize Bootstrap's built-in validation styles and JavaScript functionality to validate a form's input fields.

Total Hours 60

Reference Books:

1. HTML and Web designing - Kris Jamsa and Konrad King
2. Web Technology - N.P. Goplan, J. Akilandeswari
3. Internet Technology and Web Design - ISRD Group

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