Karmaveer Bhaurao Patil University, Satara

Syllabus for

B. Sc. II (Computer Science)

Under

Faculty of Science and Technology

(As per NEP 2020)

With effect from Academic Year 2025-2026

Syllabus for Bachelor of Science (Computer Science) Part II

PREAMBLE:

Bachelor of Science is an integrated academic degree in the faculty of science. The revision of existing syllabus of Computer Science subject in Science Faculty is essential. This is a humble endeavor to initiate the process towards an era of knowledge. The students from science faculty should also be competent for this change in the technology. In this year, a student will able to handle computers, develop the programs in languages and other peripherals with confidence. In the subject, the student will also get a basic and proper knowledge in the field of Programming skills.

GENERAL OBJEVTIVES OF THE COURSE:

1. To learn basics of Computer, hardware, software, networking.

2. To inculcate the software development attitude and generate interest in the field of Technology.

3. To develop programming skills, management skills, writing skills, Project Analysis skill among students.

4. To inculcate research attitude among students.

PROGRAMME OUTCOMES:

1. Demonstrate a solid understanding of core principles, theories, and concepts in computer science.

2. Design, implement, test, and debug software using widely adopted programming languages.

3. Develop dynamic, interactive web applications using modern web technologies and frameworks.

4. Communicate effectively in both written and verbal forms within multidisciplinary teams.

5. Collaborate efficiently to solve complex problems through teamwork and shared expertise

PROGRAM SPECIFIC OUTCOMES (PSO's):

1. Ability to design, develop, implement computer programs and use knowledge in various domains to identify research gaps and hence to provide solution to new ideas and innovations.

2. To work with and communicate effectively with professionals in various fields and

pursue lifelong professional development in computing.

3. To analyse, design, develop, test and apply management principles, mathematical foundations in the development of computational solutions, make them to expert in designing the computer software and hardware.

4. Develop their skills to solve problems in the broad area of programming concepts and appraise environmental and social issues with ethics and manage different projects in inter- disciplinary field.

1. TITLE**:** COMPUTER SCIENCE

2. YEAR OF IMPLEMENTATION: **2025-2026**

3. DURATION: **01 year**

4. PATTERN: **Semester examination**

5. MEDIUM OF INSTRUCTION: **English**

6. COURSE STRUCTURE

Sem Level	Courses			OE	VSC/ SEC	AEC/ VEC/ IKS	OJT/ FP/ CEP/ CC/RP	Total Credits	Degree/ Cum. Cr. MEME
	Course I	Course II	Course III						
	Major	Minor	-						
Sem III (5.0)	Major V (2) Major VI (2) Major P III (2)	Minor V (2) Minor VI (2) Minor P III (2)	-	OE III (2)	VSC I (2) (P) (Major Specific) SEC I (2) (T+P)	AEC I (2) (P) (English) IKS II (2) (Major Specific)	-	22	UG Diploma: 88
Sem IV (5.0)	Major VII (2) Major VIII (2) Major P IV (2)	Minor VII (2) Minor VIII (2) Minor P IV (2)	-	OE IV (2)	VSC II (2) (P) (Major Specific) SEC II (2) (T+P)	AEC II (2) (P) (English) VEC II (2) (Environmental Studies)	-	22	Exit option: 4 Cr. NSQF/ Internship/ Skill Courses
Credits	12	12	-	04	08	08	-	44	

7. COURSE TITLES

B. Sc. (Computer Science) Part-II

Semester: III				
Sr. No.	Components		Course Code	Name of the Paper	Credits

Sr. No.	Components		Course Code	Name of the Paper	Credits
1	Major	Paper I	BCST 231	Data Structure using C	2
		Paper II	BCST 232	Data Communication and Computer Network	2
		Practical	BCSP 233	Lab Based on BCST 231 and BCST 232	2
2	Minor	Paper I	BCST 234	Computer Organizations	2
		Paper II	BCST 235	Basics of HTML	2
		Practical	BCSP 236	Lab Based on BCST 234 and BCST 235	2
3	Open Elective		BCSTOE 3	Open Elective III	2
4	VSC-I		BCSTVSC-I	Object Oriented Programming using C++	2
5	SEC-I		BCSTSEC-I	System Analysis and Design	2
6	AEC-I		BCSTAEC-I	English	2
7	IKS-II		BCSTIKS-II	History of Computers in India	2
Total					**22**

Semester: IV					
Sr. No.	Components		Course Code	Name of the Paper	Credits
1	Major	Paper I	BCST 241	Object Oriented Concept using JAVA	2
		Paper II	BCST 242	Operating Systems	2
		Practical	BCSP 243	Lab Based on BCST 241 and BCST 242	2
2	Minor	Paper I	BCST 244	Cyber Security	2
		Paper II	BCST 245	Design Principles using CSS	2
		Practical	BCSP 246	Lab Based on BCST 244 and BCST 245	2
3	Open Elective		BCSTOE 4	Open Elective IV	2
4	VSC-II		BCSTVSC-II	Adobe Photoshop	2
5	SEC-II		BCSTSEC-II	XML Programming	2
6	AEC-II		BCSTAEC-II	English	2
7	VEC-II		BCSTVEC-II	Environmental Studies	2
Total					**22**

8. Evaluation Structure:

Semester III (5.0)

Course	Course Category	Course Code	Internal Evaluation			ESE	Total Marks	Credits
			CCE-I	Mid - Semester	CCE-II			
Major	T	BCST 231	05	10	05	30	50	02
	T	BCST 232	05	10	05	30	50	02
	P	BCSP 233	--	--	--	50	50	02
Minor	T	BCST 234	05	10	05	30	50	02
	T	BCST 235	05	10	05	30	50	02
	P	BCSP 236	--	--	--	50	50	02
OE	T	BCSTOE 3 (For IDS Courses)	05	--	05	15	25	01
	P	BCSPOE 3	--	--	--	25	25	01
OE	T	BCSTOE 3 (For Humanities)	05	10	05	30	50	02
VSC	P	BCSPVSC 1	--	--	--	50	50	02
SEC	T	BCSTSEC 1 Theory	05	--	05	15	25	01
	P	BCSPSEC 1 Practical	--	--	--	25	25	01
AEC I	T	BCSTAEC 1	05	10	05	30	50	02
IKS II	T	BCSTIKS 2	05	10	05	30	50	02
Total							**550**	**22**

Semester IV

Course	Course Category	Course Code	Internal Evaluation			ESE	Total Marks	Credits
			CCE-I	Mid - Semester	CCE-II			
Major	T	BCST 241	05	10	05	30	50	02
	T	BCST 242	05	10	05	30	50	02
	P	BCSP 243	--	--	--	50	50	02
Minor	T	BCST 244	05	10	05	30	50	02
	T	BCST 245	05	10	05	30	50	02
	P	BCSP 246	--	--	--	50	50	02
OE	T	BCSTOE 4 (For IDS Courses)	05	--	05	15	25	01
	P	BCSPOE 4	--	--	--	25	25	01
OE	T	BCSTOE 4 (For Humanities)	05	10	05	30	50	02
VSC	P	BCSPVSC 2	--	--	--	50	50	02
SEC	T	BCSTSEC 2 Theory	05	--	05	15	25	01
	P	BCSPSEC 2 Practical	--	--	--	25	25	01
AEC II	T	BCSTAEC 2	05	10	05	30	50	02
VEC II	T	BCSTVEC 2	05	10	05	30	50	02
Total							550	22

OTHER FEATURES:

A) LIBRARY:

Reference books, Textbooks, journals, and Periodicals are available in Institute and Departmental Library. (Separate reference lists are attached along with the respective course syllabus)

B) EQUIPMENT:

a) Computers, LCD projector, smart board

Yashavantrao Chavan Institute Of Science, Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - III
Type: Major V	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26
Name of the Course: Data Structure using C	

Course Objectives:

1) Understand the basic concepts such as Linear and Non-Linear Data structures.
2) Apply the notations used to analyze the Performance of algorithms.
3) Imbibe the behaviour of data structures such as stacks queues and their representations
4) Study an appropriate data structure for a specified application and to understand and analyse various algorithms

Course Outcomes:

1) Prepare and perform an installation of windows server 2008 and identify the various types of file systems and components.
2) Learn fundamentals of C and ability to choose appropriate data structure to represent data items in real world problems
3) Analyze the time and space complexities of algorithms
4) Demonstrate practical understanding of data communication concepts such as error detection, flow control, and transmission techniques

Module	Title and Contents	Hrs

Module -1:	**Module -1: Basic of Data Structures and Algorithms C**
	    1.1 Data Structures Basics: Structure and Problem-Solving
	    1.2 Algorithm Specification-Introduction, Performance analysis- time and space Complexity
	    1.3 Asymptotic Notation-Big O, Omega and Theta notations, Complexity Analysis Examples
	    1.4 Introduction to Linear and Non-Linear data structures, Applications of linear data structure (Searching & Sorting)
		08

Module -2:	**Module -2: Stack**
	    2.1 Introduction of stack
	    2.2 Representation –static & dynamic, Operations
	    2.3 Application-Infix to postfix & prefix, postfix evaluation
	    2.4 Concept of Multiple stacks
		07

Module -3:	**Module -3: Queue**
	    3.1 Introduction of Queue
	    3.2 Representation –static & dynamic, Operations
	    3.3 Circular queue, De-Queue, priority queues
	    3.4 Concept of Multiple Queues
		07

Module -4:	**Module -4: Linked List**
	    4.1 Introduction, Representation of linked lists in Memory, Memory allocation and Garbage collection
	    4.2 Types of linked list
	    4.3 Operations on singly linked list, traversing a linked list, Searching a linked list
	    4.4 Insertion into linked list, Deletion from a linked list
		08

Reference Books:-
1) Goodrich, Michael T., Roberto Tamassia, and David M. Mount. *Data Structures and Algorithms in C*. Wiley, 2018
2) Balagurusamy, E. Data Structures Using C. McGraw Hill Education, 2017.
3) Salaria, R. S. *Modern Data Structures Using C*. Khanna Publishing, 2017.
4) Loudon, Kyle. *Mastering Algorithms with C*. O'Reilly Media, 2018.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

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	Yashavantrao Chavan Institute Of Science, Satara
	Board of Studies in Computer Science
	Programme: B.Sc. II Computer Science **Semester** - III
	Type : Major VI **Marks:** 50
	Credits : 2 **From:** A. Y. 2025-26
	Name of the Course: Data Communication and Computer Network

Course Objectives:

1) To introduce the fundamental concepts of data communication, including transmission media
2) To understand the architecture, components, and operations of computer networks.
3) To explore the layered approach to network design (OSI and TCP/IP models).
4) To examine network security, congestion control, and wireless networking principles.

Course Outcomes:

1) Understand the basic concepts of data communication and networking, including types of networks
2) Explain the functions and services of each layer in the OSI and TCP/IP reference models.
3) Analyze and evaluate various data encoding, error detection, and correction techniques.
4) Demonstrate knowledge of switching techniques, routing algorithms.

Module	Title and Contents	Hrs

Module -1:	**Module -1: Introduction to Data Communication and Networks**
	    1.1 Basics of Data Communication,
	    1.2 Components and Types of Networks (LAN,MAN,WAN),Network Topologies
	    1.3 OSI and TCP/IP Reference Models, Networking Devices(Hub,Switch,Router)
	    1.4 Transmission Modes(Simplex, Half Duplex, Full Duplex)
		08

Module -2:	**Module -2: Physical and Data Link Layers**
	    2.1 Transmission Media: Wired & Wireless,Analog vs Digital Transmission
	
	    2.2 Multiplexing: FDM,TDM,WDM, Error Detection and Correction (Parity, CRC, Checksum)
	
	    2.3 Flow Control and Error Control Techniques, Data Link Layer Protocols: HDLC, PPP
	    2.4 MAC Protocols: CSMA/CD, CSMA/CA
		07

Module -3:	**Module -3: Network and Transport Layers**
	    3.1 Logical Addressing: IPv4 & IPv6, Subnetting and Super netting
	
	    3.2 Routing Concepts and Algorithms (Distance Vector, LinkState)
	    3.3 Protocols: IP, ICMP, ARP, RARP, TCP vs UDP
	    3.4 Connection Management and Congestion Control
		07

Module -4:	**Module -4: Application Layer and Network Security**
	    4.1 Application Layer Protocols: DNS, FTP, HTTP, SMTP, POP3,IMAP
	
	    4.2 Client-Server and Peer-to-Peer Models, Basics of Network Security
	
	    4.3 Encryption, Firewalls, VPNs
	    4.4 Introduction to Cloud and Wireless networks.
		08

Reference Books:-

1) Stallings, William. *Data and Computer Communications*. Boston: Pearson, 2013.
2) Forouzan, Behrouz A. *Data Communications and Networking*. New York: McGraw-Hill Education, 2012
3) Tanenbaum, Andrew S., and David J. Wetherall. *Computer Networks*. Boston: Pearson, 2013.
4) Comer, Douglas E. *Computer Networks and Internets*. Pearson, 2018.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

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Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science , Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - III
Type: Major Practical III	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: Practical's based on Data Structure using C and Data Communication and Computer Network

Course Objectives:

1) Understand the basic concepts such as Linear and Non-Linear Data structures
2) Apply the notations used to analyze the Performance of algorithms.
3) Imbibe the behavior of data structures such as stacks queues and their representations
4) Study an appropriate data structure for a specified application and to understand and analyze various algorithms

Course Outcomes:

1) Prepare and perform an installation of windows server 2008 and identify the various types of file systems and components.
2) Learn fundamentals of C and ability to choose appropriate data structure to represent data items in real world problems.
3) Analyze the time and space complexities of algorithms.
4) Demonstrate practical understanding of data communication concepts such as error detection, flow control, and transmission techniques.

Practical No	List of Practicals	Hrs
1	Write a linear searching algorithm with example.	04
2	Write a binary searching algorithm with example.	04
3	Write a Bubble sort, Insertion sort, selection sort algorithm with example.	04
4	Problems with Big O notations omega notations, Theta notations	04
5	STACK Implementation using Array with PUSH, POP, and display Operations.	04
6	STACK Implementation using Link list with PUSH, POP, and display Operations	04
7	Perform Queues operations using simple Array implementation. Use Templates.	04
8	Perform Queues operations using link list implementation. Use Templates	04
9	Create and perform different operations on Double-ended Queues using array implementation.	04
10	Create and perform different operations on Double-ended Queues using Linked List implementation.	04
11	Study of Networking Devices – Identify and understand routers,switches, hubs, bridges, and modems	04
12	IP Address Configuration – Assign static and dynamic IPs to computers.	04
13	Networking Commands – Use commands like ping, ipconfig, tracert, nslookup, netstat, etc	04
14	Network Topology Setup (Simulation) – Create star, bus, and ring topologies using tools like Cisco Packet Tracer or GNS3.	04
15	Calculate and create subnets from given IPs.	04

16	Static & Dynamic Routing – Setup static routing in Cisco Packet Tracer; observe dynamic routing with RIP or OSPF	04
17	Stop-and-Wait Protocol Simulation – Simple implementation to show flow control.	04
18	File Transfer using FTP – Setup an FTP server and connect clients to transfer files.	04
19	Network Security Tools – Introduction to tools like Nmap, Wireshark, or Cain & Abel for ethical learning.	04
20	Web Server Configuration – Setup Apache or Nginx server to host a website.	04

Reference Books:-

1) Balagurusamy, E. *"Data Structures Using C".* 2017

2) Tanenbaum, Andrew S., and David J. Wetherall. "Computer Networks". Boston: Pearson, 2013

3)Hanly,Jeri R."Problem Solving and Program Design in C".2015

4) Kurose, James F., and Keith W. Ross. "Computer Networking: A Top-Down Approach". Boston: Pearson, 2017

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation:	**End Semester Examination:**
• Internal Work - • Internal Work - • Internal Work -	• Question -1 • Question -2 • Question -3 • Question -4

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	Board of Studies in Computer Science
	Programme: B.Sc. II Computer Science **Semester** - III
	Type : Minor V **Marks:** 50
	Credits : 2 **From:** A. Y. 2025-26
	Name of the Course: Computer Organizations

Course Objectives:

1) Define basic concepts and terminology of computers.

2) To understand operate desktop computers to carry out computational tasks.

3) Learn working of Hardware and Software and the importance of operating systems.

4) To identify programming languages, number systems, peripheral devices, networking, multimedia and internet concepts.

Course Outcomes:

1) Understand the basic concepts of data communication and networking, including types of networks

2) Explain the functions and services of each layer in the OSI and TCP/IP reference models.

3) Analyze and evaluate various data encoding, error detection, and correction techniques.

4) Demonstrate knowledge of switching techniques, routing algorithms.

Module	Title and Contents	Hrs

Module -1:	**Module -1: Introduction to Computer Architecture**
	    1.1 Basic Computer Components: CPU, Memory, I/O devices, Basic functions of each component
	
	    1.2 Simple Block Diagram: How data flows within a computer system, Relationship between CPU, Memory, and I/O devices
	    1.3 Computer Generations: A brief overview of the history
	    1.4 evolution of computers
		08

Module -2:	**Module -2: Memory Organization**
	
	    2.1 Memory Basics: Types of memory: RAM, ROM, Cache Memory hierarchy: From Registers to Hard Disk
	    2.2 Cache Memory: What is cache memory and why is it used? Simple explanation of cache hit/miss
	    2.3 Simple Memory Structure: How memory is organized in a computer system
	    2.4 Addressing in memory (Direct and Indirect addressing)
		07

Module -3:	**Module -3: CPU Organization**
	    3.1 CPU Components: Basic parts of the CPU: ALU (Arithmetic and Logic Unit), Control Unit, Registers, The role of the ALU in processing data
	    3.2 Instruction Cycle: The Fetch-Decode-Execute cycle, A simple overview of how instructions are processed step by step
	    3.3 Registers: What are registers?
	    3.4 Purpose of general-purpose and special-purpose registers
		07

Module -4:	**Module -4: Input/output Organization**
	
	    4.1 Basic I/O Devices: Common input devices (keyboard, mouse) and output devices (monitor, printer)
	
	    4.2 I/O Operations: Basic I/O operations: Input, Output, and the role of the CPU
		08

4.3 I/O Interface How the CPU interacts with I/O devices via ports and buses **4.3** How the CPU interacts with I/O devices via ports and buses	

Reference Books:-
1) Guy Hart-Davis(2023) "The ABCs of Microsoft Office 97 Professional edition", BPB Publications.
2) Karl Schwartz(1998), "Microsoft Windows 98 Training Guide" BPB Publications.
3) C.S. French(1998) "Data Processing and Information Technology", BPB Publications
4) P.K Sinha (1992)`Computer Fundamentals`, BPB Publications

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

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Programme: B.Sc. II Computer Science	**Semester** - III
Type : Minor VI	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26
	Name of the Course: Basics of HTML

Course Objectives:

1) Understand HTML structure and syntax

2 Create responsive and accessible web designs.

3) Insert text, images, links, lists, and tables.

4) Build simple forms and apply attributes.

Course Outcomes:

1) Understand the basic concepts of data communication and networking, including types of networks

2) Explain the functions and services of each layer in the OSI and TCP/IP reference models.

3) Analyze and evaluate various data encoding, error detection, and correction techniques.

4) Demonstrate knowledge of switching techniques, routing algorithms.

Module	Title and Contents	Hrs
Module -1:	**Module -1: Introduction to HTML** **1.1** Definition and purpose of HTML, Evolution of HTML versions Setting up a development environment (text editor, browser) **1.2** HTML Documents, Basic structure of an HTML document **1.3.** Common HTML Tags, HTML Tags, formatting tags, Creating an HTML Document. **1.4** Applications of HTML,Features and Limitations Of HTML	08
Module -2:	**Module -2: Exploring HTML Elements and Functions** **2.1** Golden rules of web designing, Introduction to elements of HTML, Working with Text, HTML comments **2.2** Working with Lists,Tables and Frames, **2.3** Formatting tables using colspan, rowspan and CSS **2.4** Linking to external resources(images,CSS files,other web pages)	07
Module -3:	**Module -3: HTML Functions** **3.1** Working with Hyperlinks, Images and Multimedia **3.2** Text formatting and structuring **3.3** Forms and controls **3.4** HTML styles	07
Module -4:	**Module -4: HTML Integration** **4.1** Inline CSS Internal vs external CSS **4.2** Use of alt, label and aria attributes **4.3** Using UTF-8 character encoding **4.4** Design a multi-page responsive HTML website	08

Reference Books:-

1) Guy Hart-Davis(2023) "The ABCs of Microsoft Office 97 Professional edition", BPB Publications.

2) Karl Schwartz(1998), "Microsoft Windows 98 Training Guide" BPB Publications.

3) C.S. French(1998) "Data Processing and Information Technology", BPB Publications

4) Ben Henick (2010). *HTML & CSS: The Good Parts*. O'Reilly Media.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

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Programme: B.Sc. II Computer Science	**Semester** - III
Type : Minor Practical III	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: Practical's based on Computer Organizations and Basics of HTML

Course Objectives:
1) Understand the structure and syntax of HTML to build basic web pages
2) Apply HTML tags to format text, add images, links, lists, tables, and forms
3) Develop simple static web pages using proper coding practices.
4) Describe the basic structure and functional units of a computer system.

Course Outcomes:
1) Understand the basic structure and syntax of HTML.
2) Use standard HTML tags to design simple web pages.
3) Perform binary arithmetic and understand number systems.
4) Understand memory hierarchy and input/output operations

Practical No	List of Practicals	Hrs
1	Demonstrate data flow between CPU, Memory, and I/O.	04
2	Create a visual/electronic chart of the 1st to 5th generations of computers	04
3	Illustrate and explain Register → Cache → RAM → Disk.	04
4	Simulate how cache works using a simple C or Python program	04
5	Write small assembly-style code snippets to demonstrate addressing	04
6	Animate the Fetch-Decode-Execute process.	04
7	Create a simple 4-bit ALU (addition and subtraction only)..	04
8	Simulate data transfer between registers.	04
9	Prepare a chart showing input and output devices with specs..	04
10	Demonstrate simple CPU to I/O data transfer using simulated ports.	04
11	Create a basic HTML document with appropriate structure(DOCTYPE, html, head, body).	04
12	Use HTML tags to create headings (h1-h6) and paragraphs.	04
13	Add line breaks and horizontal rules to separate content on webpage.	04
14	Insert images into your HTML document using the img tag.	04
15	Create hyperlinks (both absolute and relative paths) to link to other web pages	04
16	Design a table that displays student information: Name, Roll Number, and Grade for at least 5 students..	04
17	Create ordered and unordered lists with list items.	04
18	Design a table with rows and columns, and apply colspan and row span attributes	04
19	Create an HTML page that embeds a video (e.g., an MP4 file) and an audio clip (e.g., MP3 file) with control options.	04

20	Create a static website.	04

Reference Books:-

1) Jon Duckett (2011). *HTML and CSS: Design and Build Websites*. John Wiley & Sons.
2) Jennifer Niederst Robbins (2018). *Learning Web Design: A Beginner's Guide to HTML, CSS, JavaScript, and Web Graphics* (5th Edition). O'Reilly Media. Jennifer
3) Guy Hart-Davis(2023) "The ABCs of Microsoft Office 97 Professional edition", BPB Publications.
4) Karl Schwartz(1998), "Microsoft Windows 98 Training Guide" BPB Publications.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation:	**End Semester Examination:**
• Internal Work - • Internal Work - • Internal Work -	• Question -1 • Question -2 • Question -3 • Question -4

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Programme: B.Sc. II Computer Science	**Semester** - III
Type : VSC I (Practical)	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: Object Oriented Programming using C++

Course Objectives:

1) Reinforce Theory with Hands-on Learning
2) Develop Strong Coding Skills
3) Learn Debugging and Error Handling
4) Deep Understanding of Algorithms.

Course Outcomes:

1) Understand the basic structure and syntax of HTML.
2) Use standard HTML tags to design simple web pages.
3) Perform binary arithmetic and understand number systems.
4) Understand memory hierarchy and input/output operations

Practical No	List of Practicals	Hrs
1	Write a C++ program to demonstrate the use of various data types and identifiers	04
2	Create a C++ program to perform basic arithmetic operations.	04
3	Implement a C++ program to find the factorial of a given number.	04
4	Implement a C++ program to display the Fibonacci series up to a given limit using a do-while loop.	04
5	Develop a program to check whether a given number is a prime number or not using for loop.	04
6	Implement a program to display the pattern.	04
7	Implement a C++ program to demonstrate class and objects.	04
8	Write a C++ program for swapping two numbers.	04
9	Implement operator overloading in C++.	04
10	Write a C++ program to demonstrate the use of constructors (default, parameterized, copy) and destructors in a class	04
11	Write a program to demonstrate the concept of inheritance with a base class "Shape" and derived classes (Rectangle, Circle) to calculate area and perimeter.	04
12	Develop a class "Employee" with static data members(employee count, total salary) and static member functions to display employee details and average salary.	04
13	Write a C++ program to implement abstraction.	04
14	Write a C++ program to implement Polymorphism.	04
15	Implement a C++ program to read and write data to a file using file handling techniques.	04

Reference Books:-
1)Malik, D. S. *C++ Programming: From Problem Analysis to Program Design*. Boston: Cengage Learning, 2014. **2)** Deitel, Paul, and Harvey Deitel. *C++ How to Program*. Boston: Pearson, 2017. **3)** Prata, Stephen. *C++ Primer Plus*. Boston: Pearson Education, 2019. **4)** Eckel, Bruce. *Thinking in C++*. Upper Saddle River: Prentice Hall, 2000

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation:	**End Semester Examination:**
• Internal Work - • Internal Work - • Internal Work -	• Question -1 • Question -2 • Question -3 • Question -4

Karmaveer Bhaurao Patil University, Satara

(A State Public University Est. u/s 3(6) of MPUA 2016)

Faculty of Science And Technology

Yashavantrao Chavan Institute Of Science, Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - III
Type : SEC I	**Marks:** 25
Credits : 1	**From:** A. Y. 2025-26
	Name of the Course: System Analysis and Design

Course Objectives:

1) Broaden their knowledge of software engineering.

2 Learn Software testing algorithms and programs.

3) Gain skills in creating DFDs, ER diagrams and UML models.

4) Learn requirement gathering, analysis and documentation techniques

Course Outcomes:

1) Identify and define system requirements through detailed analysis and user feedback.

2) Apply structured and object-oriented methodologies for system development.

3) Understand the role of testing, validation

4) Understand documentation in ensuring successful system implementation

Module	Title and Contents	Hrs

Module -1:	**Module -1: Introduction to System Concepts**
	    1.1 Definition and characteristics of a system, Types of systems
	    1.2 System development life cycle (SDLC),Feasibility study – technical , operational and economic feasibility
	    1.3 Data flow diagrams (DFDs), Data dictionary
	    1.4 Entity-Relationship diagrams (ERDs)
		08

Module -2:	**Module -2: System Design**
	    2.1 Design principles and objectives , Input design , Output design , User interface design and file and database design
	    2.2 Implementation strategies and Testing techniques and levels
	    2.3 Documentation – user manuals and system manuals
	    2.4 Unified Modeling Language (UML) – use case, class ,activity and sequence diagrams.
		07

Reference Books:-

1) Awad, Elias M. *System Analysis and Design*. Boston: Cengage Learning, 2012.

2) Kendall, Kenneth E., and Julie E. Kendall. **Systems** *Analysis and Design*. Boston: Pearson, 2013.

3) Hoffer, Jeffrey A., Joey F. George, and Joseph S. Valacich. *Modern Systems Analysis and Design*. Boston: Pearson, 2016

4) Dennis, Alan, Barbara Haley Wixom, and Roberta Roth. *Systems Analysis and Design*. Hoboken: John Wiley & Sons, 2015.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I-05 Marks • Internal Work - CCE II-05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science , Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - III
Type : SEC I(Practical)	**Marks:** 25
Credits : 1	**From:** A. Y. 2025-26

Name of the Course: Practical's based on System Analysis and Design

Course Objectives:

1) To develop the ability to analyze user requirements for system development.
2) To design system models using tools like DFD and UML diagrams.
3) To apply structured and object-oriented approaches in system design.
4) To understand and practice system documentation and reporting

Course Outcomes:

1) Apply real-world problem-solving skills by modeling user and system interactions
2) Translate business requirements into technical specifications through system design tools
3) Create and interpret Data Flow Diagrams (DFD) and UML diagrams for system analysis.
4) Develop clear, precise system documentation to support maintenance and future development

Practical No	List of Practicals	Hrs
1	Preparing Software Requirements Specifications.	02
2	Identifying Domain Classes from the Problem Statements.	02
3	Modeling UML Class Diagrams and Sequence diagrams	02
4	Modeling UML Use Case Diagrams and Capturing Use Case Scenarios..	02
5	E-R Modeling and State chart and Activity Modeling..	02
6	Modeling Data Flow Diagrams	02
7	Estimating size, effort, cost, time, and resources for a project.	02
8	Estimation of Test Coverage Metrics and Structural Complexity.	02
9	Conduct unit tests for the implemented system modules.	02
10	Create a detailed SRS document including functional and non- functional requirements.	02
11	Create an interface to connect and enable communication between two different systems..	02
12	Draw a context-level (Level 0) DFD and add more detail and draw a level1 DFD for your system.	02
13	Draw an Entity Relationship Diagram using basic symbols.	02
14	Design a sample login or data entry form and also design a simple report format (Input and Output design)	02
15	Create a small user manual with steps to use the system.	02

Reference Books:-
1) Kendall, Kenneth E., and Julie E. Kendall. *Systems Analysis and Design*. Boston: Pearson Education, 2013
2) Dennis, Alan, Barbara Haley Wixom, and Roberta M. Roth. *Systems Analysis and Design*. Hoboken: John Wiley & Sons, 2015
3) Hoffer, Jeffrey A., Joey F. George, and Joseph S. Valacich. *Modern Systems Analysis and Design*. Boston: Pearson, 2016
4) George ,Joey,kevin C.Dittman and Alam Dennis.Object-Oriented Systems Analysis and Design.Boston:Cengage Learning ,2004

Evaluation Pattern:	
Total Marks: 25	
Internal Continuous Evaluation:	**End Semester Examination:**
• Internal Work - • Internal Work - • Internal Work -	• Question -1 • Question -2 • Question -3 • Question -4

Karmaveer Bhaurao Patil University, Satara	
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Faculty of Science And Technology	
Yashavantrao Chavan Institute Of Science, Satara	
Board of Studies in Computer Science	
Programme: B.Sc. II Computer Science	**Semester** - III
Type : IKS II	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26
Name of the Course: History of Computers in India	

Course Objectives:

1) Understand design for a steam-powered, mechanical computer.

2) Learn digital computing replaced analog methods

3) Study the evolution of Indian programming languages.

4) Identify the story behind the modern computing.

Course Outcomes:

1) Design for a steam-powered mechanical computer.

2) Evaluate digital computing replaced analog methods

3) Gain the knowledge about evolution of Indian programming languages

4) Elaborate the story behind modern computing.

Module	Title and Contents	Hrs
Module -1:	**Module 1: Pre-Independence Era of Computers** **1.1** Introduction: Computing in the Pre-Independence world **1.2** Establishment of the TATA Institute of Fundamental Research **1.3** Analog Computing in the 19th and early 20th **1.4** Introduction of electronic computers in India, Information Technology before 1945	08
Module -2:	**Module -2: Early Computing Initiatives** **2.1** Development of the first indigenous electronics computer:HEC-2M **2.2** Role of F.C.kohli in setting up the first computer manufacturing company in India **2.3** Computers and culture in the 1960s **2.4** Early Computer languages and software.	07
Module -3:	**Module -3: Era of Mainframes and Minicomputers** **3.1** Introduction of mainframe and minicomputer technologies in India **3.2** Role of Department of Electronics(DoE)in prompting computerization **3.3** Evaluation of Indian programming languages(FORTRAN,COBOL)	07
Module -4:	**Module -4: Modern Computing** **4.1** Emergence of Indian IT companies and software exports, **4.2** Role of NRIs in the growth of Indian IT industry, Internet and Digital Revolution **4.3** Mobile Computing and smartphone Revolution in India **4.4** Artificial Intelligence(AI) and Machine Learning (ML) in Indian industries	08

Reference Books:-

1) Campbell-Kelly, Martin, and William Aspray. *"Computer: A History of the Information Machine".* Boulder: Westview Press, 2004

2) Turner, Fred. *"From Counterculture to Cyberculture".* Chicago: University of Chicago Press, 2006

3)Campbell-Kelly, Martin. *"From Airline Reservations to Sonic the Hedgehog: A History of the Software Industry".* Cambridge: MIT Press, 2003

4) Abbate, Janet. *"Inventing the Internet".* Cambridge: MIT Press, 1999

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

	Karmaveer Bhaurao Patil University, Satara
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	Faculty of Science And Technology
	Yashavantrao Chavan Institute Of Science, Satara
	Board of Studies in Computer Science
	Programme: B.Sc. II Computer Science	**Semester** - IV
	Type : Major VII	**Marks:** 50
	Credits : 2	**From:** A. Y. 2025-26
	Name of the Course: Object Oriented Concept Using Java

Course Objectives:

1) Improve the analytical skills of object-oriented programming and formal introduction to Java programming language.

2) Understand Object Oriented Programming language.

3) Study abnormal termination of a program using exception handling.

4) Identify the principles of the applets and its GUI programming.

Course Outcomes:

1) Demonstrate professionally acceptable coding and performance standard.

2) Learn the basic principles of the object-oriented programming.

3) Demonstrate an introductory understanding of graphical user interfaces, multithreaded programming, and event-driven programming.

4) Identify the principles of the applets and its GUI programming.

Module	Title and Contents	Hrs
Module -1:	**Module 1: Introduction To Java, Objects and Classes** **1.1** Introduction to object-oriented programming. **1.2** Basic concepts of OOP (Object, class, inheritance, polymorphism etc.) Advantages of OOP over Procedure oriented programming **1.3** History and features of Java Programming, Java Environment, Java tokens, constants, variables, data types, type casting, Operators and Expressions **1.4** Implementing Java Program, Branching and looping statements, Class, objects, methods, Constructors and destructor	09
Module -2:	**Module -2: Inheritance, Polymorphism and Packages** **2.1** Defining sub class, subclass constructor, Inheritance- Multiple and hierarchical. **2.2** Defining packages, system packages, Creating & accessing Packages,Adding a class to package **2.3** Polymorphism- function overloading and over ridding **2.4** Difference between method overloading and overriding	**07**
Module -3:	**Module -3: Multithreading and Exception Handling** **3.1** Concept of thread, Life cycle of thread, Creating threads, extending a thread **3.2** class- declaring the class, run() method, Stopping and blocking threads, Using thread method, Thread priority **3.3** Introduction to exception, Syntax of exception handling	08

Module -4:	**Module -4: AWT and Event Handling**	
	4.1 Introduction to Abstract Window Toolkit (AWT)	**06**
	4.2 Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames	
	4.3 Layout Managers: Flow Layout,	
	4.4 Border Layout, Grid Layout	

Reference Books:-
1)Schildt, Herbert. *Complete Reference Java*. New York: McGraw-Hill Education, 2002.
2) Holzner, Steven. *Java 2 Programming Black Book*. Scottsdale: Paraglyph Incorporated, 2001.
3) Balagurusamy, E. *Programming with Java: A Primer*. New Delhi: McGraw-Hill Education, 2010.
4) Horstmann, Cay S., and Gary Cornell. *Core Java Volume I – Fundamentals*. Upper Saddle River: Prentice Hall, 2007.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

Karmaveer Bhaurao Patil University, Satara

(A State Public University Est. u/s 3(6) of MPUA 2016)

Faculty of Science And Technology

Yashavantrao Chavan Institute Of Science, Satara

Board of Studies in Computer Science

Programme: B.Sc Computer Science	**Semester** - IV
Type : Major VIII	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26
Name of the Course: Operating System	

Course Objectives:

1) Imbibe brief about OS organization

2) Study memory management techniques.

3) Learn Shell operating system.

4) Understand the basic organization of operating system.

Course Outcomes:

1) Learn the fundamentals of operating systems and its types

2) Imbibe the basic Operating System Organization.

3) Identify the process & memory management in Operating System.

4) Design programs using a Shell Scripting

Module	Title and Contents	Hrs
Module -1:	**Module -1: Fundamental Concepts** **1.1** System Software Resource Abstraction,OS strategies . **1.2** Types of operating systems –Windows, Linux/Ubuntu **1.3** Multiprogramming, Batch, Time Sharing, Single user and Multiuser, **1.4** Process Control & Real Time Systems	08
Module -2:	**Module -2: Operating System Organization** **2.1** Factors in operating system design **2.2** , basic OS functions, implementation consideration. **2.3** Process modes, methods of requesting system services – system calls **2.4** system programs.	07
Module -3:	**Module -3 Process Management and Memory Management** **3.1** System view of the process and resources, initiating the OS, process address space, process abstraction, resource abstraction, process hierarchy, Thread model **3.2** Scheduling Mechanisms, Strategy selection, non-pre- emptive and preemptive strategies **3.3** Mapping address space to memory space, paging virtual memory. **3. 4** memory allocation strategies, fixed partition, variable partition	08
Module -4:	**Module -4: Shell introduction and Shell Scripting** **4.1** What is shell and various type of shell, Various editors present in linux **4.3** Different modes of operation in vi editor ,What is shell script, Writing and executing the shell script ,Shell variable (user defined and system variables)	07

| | 4.3 System calls, Using system calls, Pipes and Filters | |
| | 4.4 Decision making in Shell Scripts (If else, switch), Loops in shell, Functions ,Utility programs (cut, paste, join, tr , unique utilities) , Pattern matching utility (grep). | |

Reference Books:-

1) Silberschatz, Abraham, Peter B. Galvin, and Greg Gagne. *Operating System Concepts*. Hoboken: John Wiley & Sons, 2008.

2) Tanenbaum, Andrew S. *Modern Operating Systems*. Boston: Pearson Education, 2007.

3) Nutt, Gary. *Operating Systems: A Modern Perspective*. Boston: Pearson Education, 2003.

4) Stallings, William. *Operating Systems: Internals and Design Principles*. New Delhi: Prentice Hall of India, 2008.

Evaluation Pattern:
Total Marks: 50

Internal Continuous Evaluation:	End Semester Examination:
 • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	• Question -1 • Question -2 • Question -3

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science , Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - IV
Type : Major Practical IV	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: Practical's based on Object Oriented Concepts Using JAVA and Operating System

Course Objectives:

1) Improve the analytical skills of object-oriented programming and formal introduction to Java programming language.
2) Understand Object Oriented Programming language.
3) Study abnormal termination of a program using exception handling.
4) Understand Shell operating system and memory management techniques.

Course Outcomes:

1) Derive the process & memory management in Operating System and the basic Operating System organization.

2) Analyze professionally acceptable coding and performance standard.

3) Demonstrate graphical user interfaces, multithreaded programming, and event-driven programming.

4) Learn the basic principles of the object-oriented programming

Module	Title and Contents	Hrs
1	Program to define a structure of a basic JAVA program.	04
2	Program to define the data types, variable and operator.	04
3	Program to define the arrays and decision making and loop statements.	04
4	Program to define the Jump statements and type casting.	04
5	Program to define class and constructors. Demonstrate constructors.	04
6	Program to define class and inheritance. Demonstrate simple inheritance.	04
7	Program to define class and inheritance. Demonstrate multilevel inheritance.	04
8	Program to define class and inheritance. Demonstrate hierarchical inheritance.	04
9	Program to define class, methods, and objects. Demonstrate method overloading.	04
10	Program to define inheritance and show method overriding, demonstrate user define Packages and API Packages, demonstrate Applet structure and event handling	04
11	Write a program to check status of keyboard using interrupt handler	04
12	Write a program to implement copy command of DOS ,Program to display date and time of system	04
13	Write a program to implement pwd and wc command of linux.	04
14	Usage of following commands: ls, pwd, tty, cat, who, who am I, rm mkdir,rmdir,touch,cd	04
15	Usage of following commands: cal, cat(append), cat(concatenate), mv, cp, man, date.	04

Reference Books:-
1) Silberschatz, Abraham, Peter B. Galvin, and Greg Gagne. *Operating System Concepts*.
Hoboken: John Wiley & Sons, 2008.
2) Tanenbaum, Andrew S. *Modern Operating Systems*. Boston: Pearson Education, 2007.
3) Nutt, Gary. *Operating Systems: A Modern Perspective*. Boston: Pearson Education, 2003.
4) Stallings, William. *Operating Systems: Internals and Design Principles*. New Delhi: Prentice
Hall of India, 2008.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation:	**End Semester Examination:**
• Internal Work - • Internal Work - • Internal Work -	• Question -1 • Question -2 • Question -3 • Question -4

<table>
<tr><td colspan="2" rowspan="6"><img: University logo</td><td colspan="2">**Karmaveer Bhaurao Patil University, Satara**</td></tr>
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	Karmaveer Bhaurao Patil University, Satara	
	(A State Public University Est. u/s 3(6) of MPUA 2016)	
	Faculty of Science And Technology	
	Yashavantrao Chavan Institute Of Science, Satara	
	Board of Studies in Computer Science	
	Programme: B.Sc. II Computer Science	**Semester** - IV
	Type : Minor VII	**Marks:** 50
	Credits : 2	**From:** A. Y. 2025-26
	Name of the Course: Cyber Security	

Course Objectives:

1) Imbibe brief about OS organization

2) Study memory management techniques.

3) Learn Shell operating system.

4) Understand the basic organization of operating system.

Course Outcomes:

1) Learn the fundamentals of operating systems and its types

2) Imbibe the basic Operating System Organization.

3) Identify the process & memory management in Operating System.

4) Design programs using a Shell Scripting

Module	Title and Contents	Hrs
Module -1:	**Module -1: Operating System Organization** 　　　**1.1** Basics of Cyber security 　　　**1.2** Importance of Cyber security,Cyber security Fundamentals 　　　**1.3** Types of Cyber Attacks 　　　**1.4** security vulnerabilities, threats and attacks,Types of Active attacks, Types of Passive attacks	08
Module -1:	**Module -2: Cyberspace and the Law & Cyber Forensics** 　　　**2.1** Introduction, Cyber Security Regulations, The INDIAN Cyberspace 　　　**2.2**. National Cyber Security Policy 　　　**2.3** Digital Forensics Science, Forensics Analysis of Email, Digital Forensics Lifecycle 　　　**2.4** Challenges in Computer Forensics	07
Module -3:	**Module -3 Database Security** 　　　**3.1** Introduction to Database Security, Authentication and Authorization 　　　**3.2** Database Encryption 　　　**3.3** Auditing and Monitoring 　　　**3.4** Database Security in Cloud Environments	07
Module -4:	**Module -4: Internet and Web Application Security** 　　　**4.1** Web Security: Web authentication, Injection Flaws, SQLInjection 　　　**4.2** Web Browser Security 　　　**4.3** E-Commerce Security 　　　**4.4** Web Application Firewalls (WAF)	08

Reference Books:-

1) Preston Gralla, "How Personal and Internet Security Work", QuePublications, 2004.

2) Joseph Pelton , Indu B.Singh, "Digital Defense: A Cybersecurity Primer", Copernicus, 2025.

3) John R. Vacca, "Computer and Information Security Handbook", Morgan Kaufmann, 3rd Edition, 2027

4) Brian Craig, "Cyberlaw: The Law of the Internet and Information Technology", Lexis Nexis publishing, 2024

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science And Technology

Yashavantrao Chavan Institute Of Science, Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - IV
Type : Minor VIII	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26
Name of the Course: Design Principle using Css	

Course Objectives:

1) Understand core CSS layout and styling concepts.

2) Apply design principles using CSS.

3) Create responsive and accessible web designs

4) Create dynamic websites.

Course Outcomes:

1) Understand the role of CSS in separating structure and presentation in web design.

2) Identify and apply appropriate CSS selectors and properties to style HTML elements in alignment with design principles.

3) Construct aesthetically pleasing and user-friendly web pages using CSS box model, and layout techniques.

4) Develop responsive designs that adapt to various screen sizes using CSS media queries and flexible units.

Module	Title and Contents	Hrs

Module -1:	**Module -1: Introduction to CSS and Web Design**
	    1.1 History and Evolution of CSS, Role of CSS in Web Development
	    1.2 Basic Syntax and Structure of CSS, Integrating CSS with HTML.
	  1.3 Inspecting and Editing CSS in Browsers.
	  1.4 Adding CSS in HTML.
		08

Module -2:	**Module -2: Selectors**
	    2.1 Introduction of selectors
	    2.2. Types of Selectors.
	    2.3 CSS Elements Used in Web Design
	    2.4 Web Styling with CSS
		07

Module -3:	**Module -3 CSS Box Model**
	    3.1 Introduction to Box model
	    3.2 Images and Background.
	    3.3 Display and Position, Colors, Fonts, lists and Tables
	    3.4 Pseudo-classes and Combinators, Debugging and Dev tools, Flexbox and grid.
		07

Module -4:	**Module -4: CSS Flexbox And Grid**
	    3.1 Introduction, Flex Container, Flex Items, Responsive Flexbox.
	    3.2 Grid Introduction.
	    3.3 Grid Columns, Rows and Gaps
	    3.4 Grid Container, Grid Item
		08

Reference Books:-

1) Jon Duckett,*HTML and CSS: Design and Build Websites,*Publisher: *Wiley, 2011.*

2) Eric A. Meyer,*CSS: The Definitive Guide*, 4th Edition,**P**ublisher : O'Reilly Media, 2017.

3) Ben Frain, *Responsive Web Design with HTML5 and CSS*, 4th Edition, Publisher**:** Packt Publishing, 2022.

4) Thomas Powell, *HTML & CSS: The Complete Reference*, 5th Edition**,**Publisher**:** McGraw- Hill

Education, 2010.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - CCE I -05 Marks • Internal Work -Mid Semester -10 Marks • Internal Work - CCE II -05 Marks	**End Semester Examination:** • Question -1 • Question -2 • Question -3

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Board of Studies in Computer Science	
Programme: S	**Semester** - IV
Type : Minor Practical IV	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26
Name of the Course: Practical's based on Cyber Security and Design Principle using Css	

Course Objectives:
1) To Identify and comprehend various types of cyber threats and attacks.
2) To Familiarize with cyber laws, regulations, and ethical considerations.
3) Create responsive and accessible web designs
4) Create dynamic websites.

Course Outcomes:
1) Learn about common network attacks.
2) Understand web application attacks and vulnerabilities.
3) Construct aesthetically pleasing and user-friendly web pages using CSS box model, and layout techniques.
4) Develop responsive designs that adapt to various screen sizes using CSS media queries and flexible units.

Practical No.	List of practical	Hrs
1	Study of the features of firewall in providing network security and to set Firewall Security in windows.	04
2	Steps to ensure Security of any one web browser (Mozilla Firefox/Google Chrome)	04
3	Study of different types of vulnerabilities for hacking a websites / Web Applications.	04
4	Case Study On basic technology in cyber security.	04
5	Analysis the security vulnerabilities of Email application.	04
6	Perform encryption and decryption of Caesar cipher Write a script for performing these operations	04
7	Case Study on – Cyber Law	04
8	Case Study on – Cyber Harassment.	04
9	Case Study on – Patent Law.	04
10	Case Study on – Confidentiality, integrity, and availability (CIA triad)	04
11	Write a program on basic CSS Styling.	04
12	Inspecting and Editing CSS	04
13	Build structured layouts with CSS Grid.	04

14	Apply CSS rules to specific HTML elements using various selectors.	04
15	Design a simple webpage layout with CSS.	04

Reference Books:-

1) Jon Duckett,*HTML and CSS: Design and Build Websites,* Publisher: *Wiley, 2011.*

2) Eric A. Meyer,*CSS: The Definitive Guide*, 4th Edition, Publisher : O'Reilly Media, 2017.

3) Ben Frain, *Responsive Web Design with HTML5 and CSS*, 4th Edition, Publisher: Packt
Publishing, 2022.

4) Thomas Powell, *HTML & CSS: The Complete Reference*, 5th Edition, Publisher: McGraw- Hill
Education, 2010.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation: • Internal Work - • Internal Work - • Internal Work -	**End Semester Examination:** • Question -1 • Question -2 • Question -3 • Question -4

Karmaveer Bhaurao Patil University, Satara

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Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science , Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - IV
Type : VSC II	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26
Name of the Course: Practical's based on Vocational Skill Course :Photoshop Designer	

Course Objectives:

1) learn and applying Principals for photoshop.
2) Study the ways to balance between formal theories with practical applications.
3) Identify deep knowledge of Adobe photoshop cs2.
4) Understand the fundamental concepts of photo editing.

Course Outcomes:

1) Demonstrate in between drawing and execution with squash and stretch, staging, arc, principle
2) Create organize content and sequences for photo editing.

3) Evaluate a thorough understanding of the elements of photoshop design.

4) Create advanced editing techniques for documentary

Practical No.	List of practical	Hrs
1	Study of the graphics design software's, its types and uses	04
2	Understand the menus of software of Adobe.	04
3	Draw the elements of design: (line, shape, Forms, space, colors etc.)	04
4	Study of the photoshop software's	04
5	Browse the image and resize the image in Adobe Photoshop	04
6	Perform the properties of image in photoshop.	04
7	Design the images.	04
8	Redesign an existing image.	04
9	Drawing and sketching the image and logo.	04
10	Sketching of natural and manmade objects and environment.	04
11	Sketching of representational Drawing	04
12	Draw the image and use color Correction property in it.	04
13	Understand the features and 3D effects	04
14	Create a Poster or Flyer Design in Photoshop	04
15	Design a Creative Typographic Quote Poster	04

Reference Books:-

1) Chavez, Conrad, and Andrew Faulkner. *"Adobe Photoshop Classroom in a Book (2024 Release)".* San Francisco: Adobe Press, 2024.

2) Joyner, Joseph. *"Photoshop CC for Beginners: The Ultimate Digital Photography and Photo Editing Tips and Tricks Guide for Creating Amazing Photos".* [Place of publication not specified]:

Mihails Konoplovs, 2015.

3) Kelby, Scott. *"The Adobe Photoshop Book for Digital Photographers".* San Francisco: New Riders, 2023.

4) Barker, Corey. *"Photoshop Down & Dirty Tricks for Designers".* Berkeley: New Riders, 2011.

Evaluation Pattern:	
Total Marks: 50	
Internal Continuous Evaluation:	**End Semester Examination:**
• Internal Work - • Internal Work - • Internal Work -	• Question -1 • Question -2 • Question -3 • Question -4

	Karmaveer Bhaurao Patil University, Satara
	(A State Public University Est. u/s 3(6) of MPUA 2016)
	Faculty of Science And Technology
	Yashavantrao Chavan Institute Of Science, Satara
	Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	Semester - IV
Type : SEC II	Marks: 25
Credits : 1	From: A. Y. 2025-26
Name of the Course: XML Programming	

Course Objectives:

1) Learn and demonstrate their understanding and skillful use of the elements and principles of XML
2) Understand skill to use the digital tools as a powerful means of communication for creation, modification & presentation.
3) Identify aesthetic sensibilities into their works and explore ways to balance between formal theories with practical applications.
4) To use XML with different language

Course Outcomes:

1) Learn the basics of creating, transforming, and validating XML documents.
2) XQuery fundamentals, its uses Understand.
3) How to run complex queries on XML data.
4) How to use XML with other languages

Module	Title and Contents	Hrs

Module -1:	**Module -1: Introduction to XML**
	    1.1 Introduction to Markup Languages
	    1.2 Evolution of SGML and HTML
	    1.3 Need for XML
	    1.4 Applications of XML, Creating XML Documents, DOCTYPE Definition, DocumentType Definition (DTD), Document Type Definition (DTD), Comments, Creating Elements and Attributes.
		08

Module -2:	**Module -2: Introduction to XML**
	    2.1 The Use of Style Sheets, Using Cascading Style Sheets (CSS), XSL - The Style Sheet for XML Documents, XSL Style Sheet Template, Hyperlinks in XML Documents, Links and DTD
	    2.2 XML Document Object Model, Basic
	    2.3 Features of the Document Object Model, XML Object Interfaces, Components of an XML
	    2.4 DOM Tree StructureXML Query Language
		07

Reference Books:-

1) Fawcett, Joe, Danny Ayers, and Liam R. E. Quin. *"Beginning XML".* Indianapolis: Wrox Press, 2012.

2) Ray, Erik T. *"Learning XML: Creating Self-Describing Data".* Sebastopol: O'Reilly Media, 2003.

3) Harold, Elliotte Rusty, and W. Scott Means. *"XML in a Nutshell: A Desktop Quick Reference".* Sebastopol: O'Reilly Media, 2004.

4) Evjen, Bill, et al. *"Professional XML".* Indianapolis: Wrox Press, 2007.

Evaluation Pattern:

Total Marks: 25	

Internal Continuous Evaluation:
 	
• Internal Work - CCE I -05 Marks
 	
• Internal Work - CCE II -05 Marks
	End Semester Examination:
	    • Question -1
	    • Question -2
	    • Question -3

Karmaveer Bhaurao Patil University, Satara

(A State Public University Est. u/s 3(6) of MPUA 2016)

Faculty of Science and Technology

Yashavantrao Chavan Institute Of Science , Satara

Board of Studies in Computer Science

Programme: B.Sc. II Computer Science	**Semester** - IV
Type : SEC II Practical	**Marks:** 50
Credits : 2	**From:** A. Y. 2025-26

Name of the Course: Practical's based on XML Programming

Course Objectives:

1) Learn all the essential elements of programming
2) Explore all the main XML techniques
3) Learn to present raw data attractively and efficiently in browsers using XSL style sheets
4) Discover how to reuse basic code to create any kind of XML data management program**.**

Course Outcomes:

1) Learn how to create an XML Schema.
2) Learn how to verify that an XML document is valid according to its Schema.
3) Develop a Program using XML.
4) Integrate knowledge and skills to develop XML programming.

Practical No.	List of practical	Hrs
1	Creating a simple XML document.	04
2	Creating a simple XML document with attributes	04
3	Create an XML file using the Internal DTD.	04
4	Create an external DTD and implement it in XML file.	04
5	Creating a XML Schema.	04
6	Create an xml file to implement CSS concept.	04
7	To create a simple XSLT transformation from XSL to XML.	04
8	Create Two or more XML namespaces for different categories	04
9	Create XML code to student profile with optional and nested elements.	04
10	Create a XML file to implement XPATH concept..	04
11	Creating a XML DOM class.	04
12	Create an XML document for student information and college course listing.	04
13	Create a well-formed XML document containing details of a car like: id, company name, model, engine and mileage	04
14	Create a valid XML document containing details of a car like: id, company name, model, engine and mileage using DTD.	04
15	Write a program to connect a XML web page to any database engine.	04

Reference Books:-

1) Fawcett, Joe, Danny Ayers, and Liam R. E. Quin. *"Beginning XML".* Indianapolis: Wrox Press, 2012.

2) Ray, Erik T. *"Learning XML: Creating Self-Describing Data".* Sebastopol: O'Reilly Media, 2003.

3) Harold, Elliotte Rusty, and W. Scott Means. *"XML in a Nutshell: A Desktop Quick Reference".*Sebastopol: O'Reilly Media, 2004.

4) Evjen, Bill, et al. *"Professional XML".* Indianapolis: Wrox Press, 2007.

Evaluation Pattern:
Total Marks: 25

Internal Continuous Evaluation:	**End Semester Examination:**
- Internal Work - - Internal Work - - Internal Work -	- Question -1 - Question -2 - Question -3 - Question -4