SEMESTER-V

St. Xavier's College (Autonomous), Ahmedabad

Syllabus of Semester – V of the following departments under Faculty of Computer Science based on Undergraduate Curriculum Framework to be implemented from the Academic Year 2025-26.

DEPARTMENT OF COMPUTER SCIENCE

Major Course – 1: Linux Programming

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Pre-Requisite(s) of the Course (if any)
	Lecture	**Tutorial**	**Practical / Practice**		
Linux Programming (BCAMC551C)	2	0	2	10 + 2 from a recognized board in any stream	Nil

Learning Objective:

The student would be able:
1) Gain the necessary knowledge and skills to work effectively in Linux environments.
2) Understand file management techniques in the Linux system.
3) Utilize common Linux editors to modify files and organize their contents.
4) Learn and apply Linux commands for file manipulation and content filtering.
5) Develop proficiency in writing shell scripts using files and filters.
6) Acquire knowledge of file compression techniques and communication commands in Linux.

Learning Outcome:

After completing this course, student will be able to:
1) Recognize fundamental Unix commands for general-purpose use.
2) Gain an understanding of the Unix file system, advanced file handling, pipelining, and I/O redirection.
3) Modify file ownership and permissions using advanced Unix commands.
4) Utilize awk and grep for text processing.
5) Implement shell scripts and work with sed for stream editing.
6) Develop proficiency in creating regular expressions for pattern matching.
7) Learn the fundamentals of Unix/Linux along with process.

Unit	Unit Details	Hours

I	**• Linux Introduction**
	  o What is Linux?
	  o Linux and windows comparison
	  o The benefits of Linux
	  o Different flavors of Linux
	  o Internal and External commands
	• Linux Files and Directories
	  o Brief introduction to the types of files
	  o UNIX File System
	  o Absolute path, relative path, brief introduction to inode
	  o Listing Files and Directories-ls
	  o Matching Filenames with Patterns. (wildcard characters)
	  o Special Dot Directories, Using Dot Directories in Paths
	  o Introduction to more and less commands
	• Brief Introduction to Unix Architecture and general concepts
	  o Introduction of Kernel and Shel
	  o Introduction of the System calls
	  o Introduction to /dev/null and /dev/tty
	  o Escaping and quoting, Command Substitution
	  o Piping and Redirection
	  o File and Directory Permission and Privileges chmod
	  o Creating and Editing files using vi
		15

II	**• General Purpose Utilities Commands**
	  o cal, date, echo, bc, script, who, uname, tty, passwd, logout, wc
	  o Brief introduction to man command
	  o pwd, cat. echo, head, tail
	• Additional File Management Commands
	  o Creating Directories- mkdir
	  o Removing Empty Directories- rmdir
	  o Copying Files and Directories- cp
	  o Removing Files and Nonempty Directories- rm
	  o Renaming Files and Directories- mv
	  o Comparing Two Files- cmp
	  o What is Common- comm
	  o tee
	• Basics of Shell Scripting Programming
	  o Creating Shell Scripts using various commands of Linux except Filters.
	  o Interactive shell script using read and echo
	  o Decision Statements
	   ▪ if then fi, if then else fi, if then elif else fi, case esac
	   ▪ Test command, o Logical Operators
	  o Looping statements: for loop, while loop, until loop
	  o Break, continue command
	• Arithmetic in Shell script using expr
	• Creating Shell Scripts to perform mathematical calculations
		30

- **Locating Files-find**
- **Process Introduction**
  - Process basics
  - Brief introduction about zombie process
  - Process status
    - top
- **Basic and Advanced Filters**
  - Locate repeated and non-repeated lines-uniq
  - Ordering a file-sort
  - Filters using regular expression and searching for pattern-grep
  - Stream editor – sed
  - Simple awk filtering
    - Comparison operators
    - Variables
    - Built in variables
    - Control flow
    - Looping

III   **15**

- Environment variables
- Alias
- Inline command editing
- Miscellaneous features

- **Simple Filters**   3
  - Paginating files – pr
  - Splitting a file vertically –cut
  - Pasting files- paste
  - Translating characters –tr
- **Compressing, decompressing and achieving files**   **30**
  - Gzip, gunzip
  - Tar
  - Zip and unzip

IV

- **Communication commands**
  - Finger
  - Mesg
  - Mailx
  - Pine
  - Wall

Books to Refer:

- Unix : Concepts and Applications (Fourth Edition)
  Publisher: Tata McGraw Hill

  By Sumitabha Das

- Beginning with Ubuntu Linux (First Edition 2007)
  Publisher: Apress Publications

  By Keir Thomas

Following is the list of sample programs:

1) Display current date in dd/mm/yyyy HH:MM:SS Format.
2) Display firstname , midname , Lastname on separate lines using echo command withour using newline character or any other option.
3) Display octal And Hexagonal value of 192.
4) How to execute more than 1 command from a single line.
5) Write a command that will display all ".txt" files with their individual attributes.

6) Display your Roll no. and name with printf. Rollnum should be displayed in the width of 5 character and name should be displayed with width of 30 characters. Name should be left aligned & printed in a separate line.

7) A filename file1 contains a list of filenames. Devise a single statement that stores in a variable „count‟, display total char count of the contents of files.

8) Write a shellscript which will calculate HRA , DA , Gross salary on the basis of basic Salary.

9) Write a sheelscript to check if the country name entered is "India".

10) Write a shell script to copy source directory contents to the destination directory.

11) Write a menu driven shell script which will display the menu and perform according to the menu till user enters "yes".

12) Write a shell script that will change the extension of all .txt files to .doc.

13) Write a program that will print the following triangle

```
1
2    3
4    5    6
7    8    9    10
```

14) Write a Shell script to find if entered number is prime or not.

15) Write a Shell Script to display the following menu and act accordingly:
   a. Display "good morning" / "Good afternoon " / "Good Evening" according to current time.
   b. Count num of lines,word,characters of a file , accepted by the user
   c. Num of users who have currently logged in

16) Display file information in specific format for a given file.

   Filetype:
   Executable:
   FileSize:
   Links:
   Owner:

17) Write a shellscript to Display user information from /etc/passwd file.

18) Write a shell script to display member information on the basis of magazine name, and publication name.

19) Display book details from the bookdetails file using grep and sed commands.

20) Write a shell script using item and reorder file where items with quantity less than 10 are added to the reorder file.

21) Write a shell script to display user details on the basis of various criteria.
   a. Display Names of all users currently logged in
   b. Display names of members of a particular user group
   c. Display names of all users who are in the system

22) Write a shell script to display the details of the employee on the basis of various criteria.
   a. Display name of employee having max salary"
   b. Display employee name in caps with max salary in HRD "
   c. Display names of emp not in HRD in upper case "
   d. Display name of dept that have only 1 emp "
   e. Store 4th and 5th lines of emp in file 'new' after converting to lower case "

23) Write a shell script to find a given date fall on a weekday or a weekend.

24) Write a shellscript to compress the archive file containing shellscript & then display extracted content.

25) Write a menu driven shellscript to display values of environment variables.
   a. Display Home Directory
   b. Display Login Name
   c. Display Directories sequence
   d. Display Current Shell Name
   e. Display Primary and secondary prompt
26) Write a shellscript to display calendar of specified month on basis of various criteria.
   a. Display calendar for two months (m1,m2)"
   b. Display calendar betwee two months(m1-m2)"
27) Write a shell script to send dinner invitation using mail command.
28) Write a shell script to display five largest files from the current directory.
29) Write a menu driven shell script to display file records using various criteria.
   a. Dispaly words in Asc order"
   b. Display words in Desc Order"
   c. Toggle all the characters"
   d. Display the type of the file"
30) Write a menu driven shell script to display student details on the basis of various criteria.
   a. Display the deatils sorted by marks in descending order
   b. Display the student names ignoring the case
   c. Display the students according to roll no
   d. Sort the names save in file named names
   e. Display the student list who have scored between 70 and 80

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Syllabus of Semester – V of the following departments under Faculty of Computer Science based on Undergraduate Curriculum Framework to be implemented from the Academic Year 2025-26.

DEPARTMENT OF COMPUTER SCIENCE

Major Course – 2 : Web Technology Using PHP

CREDIT DISTRIBUTION, ELIGIBILITY AND PRE-REQUISITES OF THE COURSE

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Pre-Requisite(s) of the Course (if any)
	Lecture	**Tutorial**	**Practical / Practice**		
Web Technology Using PHP **(BCAMC552C)**	2	0	2	10 + 2 from a recognized board in any stream	Nil

Learning Objectives:
The objective of this course is to provide the necessary knowledge to design and develop dynamic, database-driven web applications using PHP.

Learning Outcomes:
Upon successful completion, students will be able to implement:
- To demonstrate the concepts of dynamic web development design and to describe the features of Integrated Development Environment precisely
- To install the features of .Java JDK, Netbeans and Xampp server.
- To implement the basic workings of PHP Functions, Objects and Arrays.
- To demonstrate the basic concepts of MySQL including CRUD Operations.
- To describe the File handling.
- To work with Forms, Cookies, sessions and Authentication

UNIT	Particulars	Hours
	- Introduction to Dynamic Web Content - Setting up a Development Server	15

- Introduction to PHP

- Expressions, Operators, Conditions, Loops

- **Form Handling**

  - Building Forms
  - Retrieving Submitted Data
  - HTML5 Form Features
- PHP Arrays

- Strings & Patterns (Quoting, Matching, Extracting, Searching, Replacing, Formatting, PCRE, NOWDOC)

- File Handling
Running PHP scripts

- **PHP Basics**

  - Writing PHP scripts with control structures and loops
  - Implementing operators and expressions

2   - **Working with Strings, Arrays, and File Handling** (10 Hours)   30

  - String manipulations using regex and pattern matching
  - Implementing file handling operations

Building Dynamic Web Forms (10 Hours)

  - Validating and processing form data
  - Storing and retrieving form data from MySQL

- Introduction to MySQL (Basics, Database Terms, Indexes, SQL Commands)

- Accessing MySQL using PHPMyAdmin

- Connecting PHP with MySQL

- Creating, Retrieving, Updating, Deleting Tables

3   - Preventing SQL & HTML Injections   15

- Database Design, Normalization, Relationships, Transactions, Backup & Restore

- Cookies, Sessions, and Authentication

- Using Placeholders, MySQLi Extension

- HTTP Authentication

- Creating and managing MySQL databases and tables

4   - Writing SQL queries for CRUD operations   30

- Preventing SQL & HTML injections

User Authentication & Sessions (10 Hours)

- Implementing cookies and sessions in PHP
- User login/logout system

Textbook:

Reference Books:

Sample Programs for Implementation in PHP

1. Write a PHP script to concatenate two strings and display it on screen.

2. Write a Program to display count, from 5 to 15 using PHP loop as given below.

3. Write a program to check student grade based on the marks using if-else statement. If marks are 80% or more, grade will be Distinction. If marks between 60% to 79%, grade will be First Division. If marks between 40% to 59%, grade will be Third Division. If marks are less than 35%, student will be Fail.

4. Write a program to show day of the week (for example: Monday) based on numbers using switch/case statements.

5. You need to write a PHP program to calculate electricity bill using if-else conditions. For first 50 units – Rs. 3.50/unit For next 100 units – Rs. 4.00/unit For next 100 units – Rs. 5.20/unit For units above 250 – Rs. 6.50/unit

6. You need to write a simple calculator program in PHP using switch case. Addition, Subtraction, Multiplication and Division.

7. Write a PHP script to calculate factorial of a number using function

8. Create a class student with any 3 properties and functions to get and set the data. Create instance of the class and display the data on the console.

9. Create shape class as class having area function. Create rectangle, triangle, square class based on this class.

10. Write a program to implement the class Employee. Show Constructor Overloading.

11. Write a program to find the greatest and the smallest element of the given array

12. Write a program in PHP to remove specific element by value from an array using PHP program.

13. Write a program to sort, shuffle, extract and reset the array elements.

14. Write a PHP script to find the length of the string and whether a string is palindrome or not. Also Count Number of vowels, spaces, words and digits

15. Write a PHP Script to replace and reverse the string

16. Design the personal information form ,submit and retrieve the form data using php $_POST,$_GET,$ REQUEST variable

17. Design Login Form and Validate that form using PHP Code

18. Write a PHP Script to read from the file

19. Write a PHP Script to create and write into the file 10.Write a PHP script to copy the file.

20. Create a database in MYSQL Customer (Code, Fname, Lname, city). Assign Primary Key. Insert 5 records out of which 3 customer should belong to Baroda. Then Update the city field to "Vadodara".

21. Create an Employee database. Assign Primary key. Employee(emp_ID, Name, designation, dept,salary) • List out the details of Executives • List out the details of managers • Update the designation of "Manager" to "Branch Manager".

22. Create an Emp_Leave database. Assign Primary key. Emp_Leave (emp_ID, Name, DateofLeave, Leavetype) Note: Leavetype can be CL, PL or ML • List out the details of Employees taken CL with its count • List out the details of Employees taken PL with its count • List out the details of Employees taken ML with its count

23. Create an Order database. Assign Primary key

    Order (ID, Date, ProductName, CustomerName, City)

    • Perform a Parameterized query to display the order city-wise

    • Perform a Parameterized query to display the order Productwise

    • Perform a Parameterized query to display the order-details in different range of dates.

24. Create a student database (rollno, name, surname, course, hscmarks) Assign Primary Key and Insert 10 records.

    • Display students details with the surname "Patel"

    • Display student details who has scored above 80% marks in HSC

    • Display student details who failed in HSC 8. In the database which is created in Program No. 02, Execcute the following queries:

    • Display the employee with salary 20000.

    • Display the employee with the salary > 20000 and less than 50000

    • Display employee details from Designing department

25. Write a PHP code to create database & table in Mysql.

26. Write a PHP code to insert ,delete, select the data from database 3. Write a program to get the username & password from user. If the given username is "admin" and password is "xyz" show the welcome message otherwise show the error and redirect to login page.

27. Create the pages for fruits and vegetables; write the program to display the selected item in separate page using cookies.

28. Create the pages for fruits and vegetables with their rates, no. of qty, write the program to calculate the subtotal & total display the selected item and subtotal & total display in separate page using cookies.

29. Create the login web page using session.

30. Create the page to get the employee personal information and store the information in mysql db. Include Registration Page, login page and profile page. Implement CRUD operation.

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Syllabus of Semester – V of the following departments under Faculty of Computer Science based on Undergraduate Curriculum Framework to be implemented from the Academic Year 2025-26.

DEPARTMENT OF COMPUTER SCIENCE

Major Course – 1: Software Development Project - 1

Course Title & Code	Credit Distribution of The Course			Eligibility Criteria	Pre-Requisite(s) of the Course (if any)
	Lecture	**Tutorial**	**Practical / Practice**		
Software Development Project-1 **(BCAMC553C)**	0	0	8	10 + 2 from a recognized board in any stream	Nil

Learning Objectives:

1. Students will be exposed to software development process by choosing a typical business/scientific/administrative/system application
2. Define project scope, assess feasibility, and establish a project schedule.
3. Get some experience in working with a client organization.
4. Gain experience in working in a group for successfully developing the deliverables

Learning Outcomes:

At the end of the course, the student will be able to:

- To analyse in depth the existing as well as the proposed system.
- To prepare the blueprint of any real time system using various diagrams such as DFD, ERD and UML diagrams.
- To create the datastore and normalize them by identifying the relationships between the different data tables.
- To improve their communication as well as presentation skills.
- To achieve the goal within the given time constraint.
- To manage the team work effectively

Mode of study: Half / One day off to work on the project in a week. (At least three hours must be allotted in weekly timetable for discussion/preparation of deliverables)

Course Contents:

Students are expected to work on the following during the semester.

- Doing System Analysis
- Preparing System Flow Diagram
- Developing Entity Relationship Diagram
- Developing Data Flow Diagram / UML Diagram
- Building Data Dictionary

Guidelines:

- ➢ **Group Size: 2 or 3 students.**
- ➢ **Where to look for Project?**
- ➢ Government Organizations
- ➢ Local Self Government (Municipalities, Panchayats, Urban Development Authorities etc.) or public / private bodies or NGOs.
- ➢ Public Sector Organizations
- ➢ Educational institutes
- ➢ Trading/Business houses
- ➢ Private Organizations
- ➢ Software Consultancy companies (only if the project work seem to be original and beneficial)
- ➢ A challenging in-house software project.
  The location of the organization is immaterial. It can be Local in the city In the vicinity of the city.
- ➢ Mostly the work will have to be done at home or the institute.

Which Project to Avoid?

- The project of system study
- Involves only modification in existing software, such as porting of software or few updates
- Involves only data storage and retrieval without any processing.

  Conventional small applications such as
  • Library Management
  • Examination (conduct or Results)
  • Educational Institute Management
  • Payroll
  • Accounting system or inventory Human Resource

Note: Students can take up any of the above only if the application would handle real volume and will have substantial complexities

Preferred Projects:

- Will be such as that caters to Innovative areas/ideas
- Use of emerging technology – RFID GPS Biometrics Bioinformatics, GIS etc.
- Challenging uses of Communication and Internet
- Scientific applications
- Graphics applications
- Systems software and utilities
- Embedded software o ERP modules

Preferred Tools:

- Students should feel free to use the tools of their choice subject to permission of the organization. Working on any acceptable project would give good exposure to use of analytical tools, programming skills and development tools. Hence, any programming or development environment should be acceptable.

Deliverables by the students:

- At the end of the semester, the student should be able to work on the identified the project and submit the documentation (hard copy) and the presentation.

Documentation:

A hard copy of the documentation should consist of the following:

- Cover Page
- Company Certificate
- College Certificate
- Acknowledgement
- Index (with page nos.)
- Organization / Company Profile
- Project Profile Existing System Proposed System Development Tools and Technology used
- System Flow Diagram (if applicable)
- UML Diagram
- Data Flow Diagram *
- Entity Relationship Diagram *
- Data Dictionary / Table Design * *
  In applications which uses database.

• **Presentation:**

- Presentations can be prepared through slides using any Open Source / PowerPoint /Flash or any other multimedia tool, covering the work shown in the documentation.

- During viva examination, students will be expected to satisfactorily answer questions pertaining to the project profile, diagrams and tables/data dictionary prepared by them.