

Estd. 1962

'A++" Accredited by NAAC (2021)

With CGPA 3.52

SHIVAJI UNIVERSITY, KOLHAPUR - 416004, MAHARASHTRA

PHONE: EPABX-2609000, www.unishivaji.ac.in, bos@unishivaji.ac.in

शिवाजी विद्यापीठ, कोल्हापूर -४१६००४,महाराष्ट्र

दूरध्वनी-ईपीएबीएक्स -२६०९०००, अभ्यासमंडळे विभाग दुरध्वनी ०२३१—२६०९०९४ ०२३१—२६०९४८७



Ref.No.SU/BOS/Science/271

To,

The Principal, All Concerned Affiliated Colleges/Institutions Shivaji University, Kolhapur.

Subject: Regarding revised syllabi of B.Sc. Part-II (Sem.III & IV) degree programme under the Faculty of Science and Technology as per NEP-2020 (2.0).

Sir/Madam,

With reference to the subject mentioned above, I am directed to inform you that the university authorities have accepted and granted approval to the syllabi, nature of question paper B.Sc. Part-II (Sem. III & IV) degree programme under the Faculty of Science and Technology as per NEP-2020 (2.0).

	B.Sc.Part-II (Sem	. III &	IV) as per NEP-2020 (2.0)
1.	Pollution	8.	Food Science (Entire)
2.	Biochemistry	9.	Biotechnology (Entire)
3.	Food Science and Quality Control	10.	Environmental Science (Entire)
4.	Computer Science (Optional)	11.	Information Technology (Entire)
5.	Biotechnology (Optional/Vocational)	12.	Food Science and Technology (Entire)
6.	Animation (Entire)	13.	Food Technology & Management (Entire)
7.	Computer Science (Entire)	14.	All Faculty UG Part II Environmental Studies (VEC)

This syllabus, nature of question and equivalence shall be implemented from the academic year 2025-2026 onwards. A soft copy containing the syllabus is attached herewith and it is also available on university website <u>www.unishivaji.ac.in NEP-2020@suk(Online Syllabus)</u>

The question papers on the pre-revised syllabi of above-mentioned course will be set for the examinations to be held in October /November 2025 & March/April 2026. These chances are available for repeater students, if any.

You are, therefore, requested to bring this to the notice of all students and teachers concerned.

Thanking you,

Yours faithfully, Dy Registrar Dr. S. M. Kubal

Encl: As above

for Information and necessary action

Copy to:

Copy				
1	Dean, Faculty of Science & Technology	6	Appointment Section A & B	
2	Director, Board of Examinations and Evaluation	7	I.T.Cell /Computer Centre	
3	Chairman, Respective Board of Studies	8	Eligibility Section	
4	B.ScM.Sc. Exam Section	9	Affiliation Section (T.1) (T.2)	
5	Internal Quality Assurance Cell (IQAC Cell)	10	P.G. Seminar Section	

Date: 03/05/2025

SHIVAJI UNIVERSITY, KOLHAPUR



NAACA++Grade withCGPA3.52

Multiple Entry and Multiple Exit Option (NEP-2020)

Syllabus for

B.Sc. Computer Science (Optional)

(Under Faculty of Science and Technology)

PART-II SEMESTER- III &IV

(Syllabus to be implemented from Academic year 2025-26)

Multiple Entry and Multiple Exit Option (NEP-2.0)

B.Sc. Computer Science Optional Part-II (Level-5.0)

	SEMESTER-III(Duration- Six Month)									
		Teach	ing Sch	eme		Examination Scheme				
Sr.	Course Code	Theory and Practical		University Assessment (UA)			Internal Assessment (IA)			
No.		Lectures (Per week)	Hours (Per week)	Credits	Max. Marks	Min. Marks	Exam minutes	Max. Marks	Min. Marks	Exam minutes
1	Subject I Major V: Web Technology	2	-	2	40	14	90	10	04	20
2	Subject I Major VI:Object Oriented ProgrammingUsing C++	2	-	2	40	14	90	10	04	20
3	Subject I Practical III: Practical Based on Subject I Major V & Major VI	-	4	2	40	14	90	10	04	-
4	Minor V: As per students choice and availability but must be continued with Minor I and Minor IV	2	-	2	40	14	90	10	04	20
5	Minor VI : As per students choice and availability but must be continued with Minor I and Minor IV	2	-	2	40	14	90	10	04	20
6	Minor Practical III: Practical based on Minor V and Minor VI	-	4	2	40	14	90	10	04	-
7	OE– III (T/P): Basics of HTML and Java Script	2	-	2	40	14	90	10	04	20
8	VSC–I (P) Major Specific: Angular JS	-	4	2	40	14	90	10	04	20
9	SEC-I (T): Essentials of Cyber Security	2	-	2	40	14	90	10	04	20
10	AEC-I:Formal Communication	2	-	2	40	14		10	04	20
11	CC-I:Basics of Yoga	2	-	2	40	14	90	10	04	20
	Total (A)			22	440			110		

SEMESTER-IV(Duration-Six Month)										
Sr.	Course Code	Teac	hing Sch	ieme	Examination Scheme					
No.		Theor	Theory and Pra		l University Assessment (UA)			Internal Assessment (IA)		
		Lectures (Per week)	Hours (Per week)	Credits	Max. Marks	Min. Marks	Exam minutes	Max. Marks	Min. Marks	Exam minutes
1	Subject II Major VII: PHP and MySQL Using OOP'S	2	-	2	40	14	90	10	04	20
2	Subject II Major VIII : Data Structure Using C++	2	-	2	40	14	90	10	04	20
3	Subject II Practical IV: Practical Based on Subject II Major VII & Major VIII	-	4	2	40	14	90	10	04	-
4	Minor VII: As per students choice and availability but must be continued with Minor I and Minor IV	2	-	2	40	14	90	10	04	20
5	Minor VIII: As per students choice and availability but must be continued with Minor II and Minor V	2	-	2	40	14	90	10	04	20
6	Minor Practical IV: Practical based on Minor VII and Minor VIII	-	4	2	40	14	90	10	04	-
7	OE– IV (T/P): Basic C Programming	2	-	2	40	14	90	10	04	20
8	SEC-II (P): Basics Python Programming	-	4*	2	40	14	2	10	04	-
9	AEC-II Soft skills	2	-	2	40	14	2	10	04	2
10	VEC – II (T) Environment Studies	2	-	2	40	14	2	10	04	2
11	CEP-I (P): Field work	-	4		10	4		40	14	90
	Total (A)			22	440			110		
	• OE: Open Elective			• \$	SEC: Sł	kill Enha	ncement	Course		
	• VSC: Vocational Ski	ill Course		• 4	AEC: A	bility En	hanceme	nt Course	e	
	• CC: Co-Curricular C	ourse		• (CEP: C	ommunit	ty Engage	ement Pro	ogram	

B.Sc. Computer Science [Optional](Semester III)(NEP2.0)(Leel–5.0) Course: Subject I Major V Course Title: Web Technology Total Contact Hours: 30 Hrs.(30 Lectures of 60 minutes) Marks: 50 Credits:02

Course Outcomes: Upon successful completion of this course, students will be able to

- 1. Understand the principles of web design.
- 2. Construct basic web sites using HTML and Cascading Style Sheets.
- 3. Build dynamic web pages with validation using JavaScript.
- 4. Develop a modern web application that meets the current industry requirement.

UNIT 1

(15 Hours)

Introduction to Internet, HTML, CSS and JavaScript

Fundamentals :-Introduction Internet, WWW, Web Browsers, Web Servers. URL and URI, Overview of different protocols:-HTTP,SMTP, FTP,HTML :-Introduction, History and evolution of HTML, HTML Versions, Standard HTML

DocumentStructureBasicTextFormattingElements,,<i>,<s>,<emp>,<u>,<small>,<big>,<tt>. , Images,HypertextLinks<a>,and<div>,Lists-Ordered and Unordered, <input> (Type – Text, Password, Button, Submit, Reset) , Table tags , Frames , Marquee , Navigation menus , Semantic tags , Cascading Style Sheets :-Introduction , Types of CSS , Basic syntax , Selectors–element, id, class, group, universal, Style Properties of color, font, text, size and border

UNIT 2

JavaScript:-Introduction, Document Object Model, Variables, Data types and Operators, Control Statement –if, if-else, break ,Looping Statements–while, for , Element Access in Javascripts–getElementById() and getElementsByName(), Event and event handling –onClick(), onBlur(), onFocus(),onKeyPress(), Dialog boxes–alert(),prompt(), confirm().

Text Book/Reference book:

- 1. Web Programming-John Dean, John and Bartlett Learning
- 2. Internet Fundamentals & Concepts -Shubhra Garg, S.K.Kataria& Sons
- 3. PHP and MySQL by DreamtechPublications
- 4. Angular: Up and Running: Learning Angular, Step by Step by Shyam Seshadri, O'Reilly

(15 Hours)

B.Sc. Computer Science Optional (Semester-III)(NEP2.0)(Level-5.0)

Course: Subject I Major VI Course Title: Object Oriented Programming Using C++ Total Contact Hours: 30 Hrs.(30 Lectures of 60 Minutes) Marks:50 Credits:02

Course Outcomes:

After successful completion of this course, students will able to:

- 1) Understand the features of object-oriented programming and C++ concept.
- 2) Apply the concepts of object, classes and constructor.
- Learn C++ Programs based on object, class, inheritance, abstraction, encapsulation, dynamic binding and polymorphism.
- Understand dynamic memory management techniques using pointers, constructors, and destructors etc.

UNIT 1

Basics of OOP and Introduction to C++

Introduction to Object Oriented Programming, Difference between POP & OOP , Basic Concepts of OOP , Features of OOP , Data types , Keywords , Variable

Definition: - Declaration, Initialization, Dynamic Initialization and reference variables

Operators:- DMA operators (new, delete), Scope resolution operator, Manipulators

(setw, endl, setprecision), Functions:- Definition, Declaration, Function Call (by value, by pointer, by reference), default arguments, const arguments, inline function

UNIT 2 Object Oriented Programming

Class ,Class specifications, Class declaration, Class definition, Adding data membersandmember functions, Access Modifiers, Member function definition - inside the class and outside the class, Object definition and memory allocation of object, Use of this pointer, Static Members - data members and member function, Friend function and friend class,

Characteristics of friend function, Declaration and Definition of friend function, Use of friend class, Constructor and Destructor, Constructor - Definition, Characteristics, Types : - Default, parameterized, copy, Destructor:- Definition, Characteristics,

Operator overloading:- Concept and Rules, Definition of operator function, Overloading unary and binary operators, Inheritance :-Concept, Types - Single, Multilevel, Multiple, Hierarchical, Hybrid, Visibility of derived members, Diamondproblem with hybrid inheritance (virtual inheritance), Virtual base class, Polymorphism :- Definition, Types- Compile-time and Run-time, Pointer to object, Virtual Function– Rules for Virtual Function, Pure virtual function (abstract class)

(15 Hours)

(15 Hours)

Text Books / Reference Books:

- 1. Object Oriented Programming in C++ Rajesh K. Shukla
- 2. Object Oriented Programming with C++ Poonam Ponde
- 3. Object Oriented Programming with C++ E Balagurusamy
- 4. Mastering C++ K.R.Venugopal
- 5. C++ Programming D. Ravichandran
- 6. A Tour of C++ (2nd Edition) Bjarne Stroustrup
- 7. The C++ Programming Language (4th Edition) Bjarne Stroustrup

B.Sc. Computer Science (Optional)(Part-II)(Semester-III)(NEP 2.0) Major Practical- III Computer Science Practical based on Major VI Practical based on Major V &VI - Web Technology and Oriented Programming Using C++ Teaching Scheme:Practical–4 Lectures/Week/batch Credits:02 Total Marks:50

List of Practical:

Following is a sample list of assignments for practical; instructors are advised to provide more lab assignments to students to meet the course specified outcomes.

Sr. No.	Name of the Practical
1.	Design a welcome page by using the tags like title, head and body
2.	Design a webpage to display use of all the head tags
3.	Design a webpage to showcase use of marquee tags
4.	Design a html page to display an history of your college using various text formatting tags
5.	Write Html program to display a table with 5 rows and 4 columns. Provide appropriate heading to the form
6.	Design HTML Page to display the table of your last semester examination
7.	Design HTML page to demonstrate a Clickable image
8.	Write a CSS code to change the square into circle when mouse is over to the square shape
9.	Write a CSS code to create 3 different colors box which partially overlapped to each other
10.	Design your personal website using external CSS
11.	Write a JavaScript to use all the dialog boxes
12.	Write a JavaScript function to calculate square of given number
13.	Write a JavaScript function demonstrating for loop
14.	Write a C++ program based on branching and looping statements.
15.	Write a C++ program To Calculate Factorial of a Given Number
16.	Write a C++ program For Converting Temperature Celsius Into Fahrenheit
17.	Write a C++ program based on implementation of class having data member, member function inside the class.
18.	Write a C++ program based on implementation of class having data member, member function outside the class.
	Write a C++ program to create a class called Rectangle that has private member variables
19.	for length and width. Implement member functions to calculate the rectangle's area and
	perimeter.
	Write a C++ program to create a class called Person that has private member variables for
20.	name, age and country. Implement member functions to set and get the values of these
201	variables.
21.	Write a C++ program based on static data members and static member function.
22.	Write a C++ program based on usage of constructor with its types.

23.	Write a C++ program based on destructor.
24.	Write a C++ program based on usage of Inline and friend function.
25.	Write a C++ program based on implementation of inheritance with its types.
26.	Write a C++ program based on implementation of function overloading.
27.	Write a C++ program based on implementation of unary, binary operator overloading.
28.	Write a C++ program based on implementation overloading operator using friend function.

B.Sc. Computer Science Optional (Semester–III)(NEP2.0)(Level–5.0) Course: Subject I Major VI Course Title: OE-III (T/P) Basics of HTML and Java Script Total Contact Hours: 30Hrs. (30 Lectures of 60Minutes) Teaching Scheme: Theory–02Lectures/Week Marks:50 Credits:02

Course Outcomes:

After completion of this course students will able to;

- 1. Understand basics of HTML
- 2. Apply CSS for styling
- 3. Implement JavaScript for Interactivity

UNIT I

(15 Hours)

Introduction to Internet: Fundamentals, Introduction Internet, WWW, Web Browsers, Web Servers. URL and URI, Overview of different protocols, HTTP,SMTP, FTP

HTML: Introduction, History and evolution of HTML, HTML Versions, Standard HTML Document Structure, Basic Text Formatting, Elements,,<i>,<s>,<emp>,<u>,<small>,<big>,<tt>. Images, Hypertext Links <a>, and <div>, Lists-Ordered and Unordered, <input> (Type – Text, Password, Button, Submit, Reset). Table tags, Frames, Marquee, Navigation menus, Semantic tags

Cascading Style Sheets: Introduction, Types of CSS,Basic syntax, Selectors–element, id, class, group, universal, Style Properties of color, font, text, size and border

UNIT 2

(15 Hours)

Java Script: Introduction, Document Object Model, Variables, Data types and Operators, Control Statement –if, if-else, break, Looping Statements–while, for, Element Access in JavaScripts–getElementById() and getElementsByName(), Event and event handling –onClick(), onBlur(), onFocus(), onKeyPress(), Dialog boxes–alert(),prompt(), confirm()

Reference Books

- 1. Web Programming John Dean, John and Bartlett Learning
- 2. Internet Fundamentals & Concepts Shubhra Garg, S.K.Kataria & Sons

3. Web Technologies HTML, JavaScript, PHP, Java, JSP, ASP.NET, XML, and AJAX -Comprehensive Problem Solver, Black Book -Kogent Learning Solutions Inc, Dreamtech Press, Willey India Pvt Ltd.

- 4. Internet and World Wide Web How to Program P. J. Deitel, H. M. Deitel,, Pearson
- 5. Complete reference of HTML and CSS by Thomas A. Powell

B.Sc. Computer Science Optional (Semester–III) (NEP2.0)(Level–5.0) Course Title: VSC–I (P): Major Specific: Angular JS Total Contact Hours: 30Hrs. (30 Lectures of 60 Minutes) Marks:50 Credits:02

Course Outcomes:

After successful completion of this course, students will able to:

- 1) Understand fundamentals of Angular JS and its architecture
- 2) Create routing solutions
- 3) Apply filter in Angular JS application
- 4) Explore Angular JS component

UNIT 1

(15 Hours)

Introduction to Angular JS and its features, Benefits, Setting up the development environment, Angular JS application structure and file organization, Creating the first Angular JS application, Angular JS Expressions, Directives, Working with built-in directives, Creating custom directives, Controllers, Modules, Scopes, Dependency, Introduction to filters and usage, Implementing custom filters, One-way and two-way data binding, Tables, Select, DOM

UNIT 2

(15 Hour)

Defining Controllers, Using \$scope Object, Controller Inheritance, Controller Communication, Best Practices for Controllers, Forms and Inputs (ng-form, ng-model, ng-submit), Validations (required, minlength, maxlength, pattern, etc.), Displaying Validation Errors, Custom Validation, Services, Creating and Using AngularJS Services

Reference Books

- 1. ANGULAR JS Programming, In 8 Hours, For Beginners, Quick Start Guide: Angular JS Book Crash Course Tutorial & Exercises by Ray Yao, Dart R. Swift, Pandas C. Perl
- 2. Learning Angular JS: A Guide to Angular JS Development by Ken Williamson Angular JS: Angular JS. A Code Like a Pro Guide For Angular JS Beginners Kindle Edition by Jonathan Bates

B.Sc. Computer Science Optional (Semester–III) (NEP2.0)(Level–5.0) Course Title: SEC-I (T): Essentials of Cyber Security Total Contact Hours: 30Hrs. (30 Lectures of 60 Minutes) Marks:50

Course Outcomes:

After successful completion of this course, students will able to:

- 1. Understand importance of cyber security and security management.
- 2. Learn different security threats.

UNIT 1

(15 Hours)

(15 Hours)

The introduction to Cyber Security, The importance of Cyber Security, History of Cyber security, Important Terms used in Cyber security, Major Components of Cyber security, Types of Cyber Threats, The Cyber Attack Lifecycle, Impacts of Cyber Attacks ,Understanding Cyber Threats :-Malware, Phishing, Ransomware, Denial-of-Service (DoS) and Distributed Denial-of-Service (DDoS) Attacks, Advanced Persistent Threats (APTs), Zero-Day Exploits, Insider, Threats, Social Engineering ,Defensive Cyber Security Strategies : Introduction, Implementing, Strong Access Controls, Securing Networks and Systems, Encrypting Data, Implementing, Security Policies and Procedures, Conducting Regular Security Assessments, Implementing Backup and Recovery Solutions ,Foundational Principles of Defensive Cyber security, Network Security, Endpoint Security

UNIT 2

Defensive Cyber Security Strategies: Identity and Access Management (IAM), Data Protection, Incident Response and Management, Threat Intelligence and Monitoring, Human Factors in Cyber security, Regulatory Compliance and Legal Considerations, Cyber Security in Corporate Environments:Introduction, Corporate Cyber Security Frameworks and Standards, Network Security in Corporate Environments, Endpoint Security for Corporations, Application Security in Corporations, Identity and Access Management (IAM), Data Protection and Privacy, Building a Comprehensive Cyber Security Program, Protecting Corporate Networks and Systems, Ensuring Compliance with Regulations, Employee Training and Awareness, Incident Response and Recovery, Securing Personal Devices and Data:Introduction, Fundamentals of Device Security, Securing Mobile Devices, Protecting Personal Computers, IoT Device Security, Data Protection and Privacy, Securing Online Accounts, Safe Internet Practices, Social Media Security, Securing Personal Communication, Children's Online Safety, Identity Theft and Fraud Prevention, Digital Hygiene and Maintenance **Reference Books:**

- 1. Introduction to Cyber Security, Chwan-Hwa(john) Wu,J. David Irwin,
- 2. E-Commerce- Indian Perspective- P.T. Joseph S.J.
- 3. E-Commerce and Security- KjellOrsborn
- Cybersecurity: The Essential Guide by Pacific Books International by S.B.Gaikwad, K.G.Kharade, Rashmi Agrawal, R.K.Kamat

Credits:02

B.Sc. Computer Science Optional (Semester-III) (NEP2.0) (Level-5.0)

Course: AEC-I

Course Title: Formal Communication Total Contact Hours: 30Hrs. (30 Lectures of 60Minutes)

Marks:50

Course Outcomes:

The course will enable students to;

- 1. Introduce communication techniques
- 2. Have professional correspondence techniques
- 3. Enhance writing skills

UNIT 1

(15 Hours)

Communication : -Nature and Importance of Communication, Objectives of Communication, Importance of Communication, Process and barriers to Communication, Elements of Communication, Forms of Communication Verbal Communication , Techniques: Art of Speaking, Speech Styles. Oral Presentation- Preparation of Formal Speech, Meetings, Interviews, Group Discussion, Debate, Elocution, Extempore

UNIT 2

(15 Hours)

Non-verbal Communication: Meaning, Characteristics & classification of Non-verbal Communication, Body Language, Gestures, Postures. Listening & observation skills. Rapid review of Grammar:-Corrections of common errors, Verb and its subject, forms of verb. Use of phrases and idioms, Use of infinitive Gerund Participle, Errors and & Use of Adjective and adverb, Punctuation and capitalisation

Reference Books:

- 1. R.K. Chaddha Communication Techniques and skills DhanpalRai Publication, NewDelhi.
- 2. Pravil S. R. Bhatia, Professional Communication Skills- S. Chand and Co., NewDelhi.
- 3. J.D.O'Connor, Better English pronounciation.
- 4. Wren and Martin, Highschool English Grammer and Composition Chand and Co., New Delhi.

Credits:02

Course: CC-I

Course Title: Basics of Yoga Total Contact Hours: 30Hrs. (30 Lectures of 60 Minutes) Marks: 50

UNIT 1

Introduction to Yoga

Yoga Definition, Objectives of yoga Education Difference between Yoga Asana, and physical exercises, Importance of Yoga in daily life, Methods and benefits of Asanas, Pranayama and Concentration, Knowledge of five yama with more emphasis on 'Asteya', Knowledge of five Niyama with emphasis on 'Santosh', Knowledge of Aahar-Vihar, Methods and benefits of Sukshma, Vyayama, Asanas and prayers. Types of Yoga: Jnana Yoga, Bhakti Yoga, Karma Yoga, Hatha Yoga, Raja Yoga.

UNIT 2

Yoga Literature and Asanas

Role of yoga in character building, Therapeutic values of yoga, Introduction of yoga literature, Life history of Arvindo, Vivekanand and other yogis, Knowledge of Bandha, Mudra and Chakras, Methods and benefits of Asans, Pranayama and Concentration Effects of Asanas and Pranayama on physiology of human body, Concept of Nishkama Karma Yoga, Role of Yoga practices in eveloping concentration, will power and discipline, Techniques of stress management, Methods and benefits of Asanas, Pranayama and concentration

References:

- 1. Light on Yoga by B.K.S. Iyengar
- 2. The Yamas & Niyamas: Exploring Yoga's Ethical Practice by Deborah Adele

Credits:02

(15 Hours)

(15 Hours)

B.Sc. Computer Science [Optional] (Semester–IV)(NEP2.0)(Level–5.0) Course: Subject I Major VII Course Title: PHP and MySQL Using OOP'S

Total Contact Hours: 30Hrs. (30 Lectures of 60 minutes) Teaching Scheme: Theory- 02 Lectures/Week Marks: 50 Credits:02

- **Course Outcomes: Students will be able** 1. To understand basic concept of PHP.
 - 2. To Learn how to developing applications in PHP using MySQL.
 - 3. To learn and develop various PHP technology applications that definitely meets the current industry needs.

UNIT I

(15 Hours)

Introduction to PHP Scripting

Introduction: Evaluation, Features, PHP Script(PHP tags <?php... ?>, SGML- style tags<?...?>,ASP style <% ... %>, HTML Script Tag), Comment(single and multiline), echo command, PHP script execution on terminal and web browser. Variable: Basics, Data types (Boolean, Integers, Floating points Doubles, Strings, NULL, Arrays, Resources), Variable naming rules, scope(Local,Global, static, function parameter), unset variable, Functions(gettype(), isset(), is_array(), is_bool(), is float(), is_int(), is_null(), is_string(), is_resource()), Constant:define() function to define constant, constant() to retrieve value of constant, difference between constant and variable, PHP predefined constants Operators: Arithmetic, Comparison, Relational, Assignment, Increment-Decrement, Ternary, Bitwise, Casting, Other operators(., \$, @, {}, ", =>), Operator Precedence

Strings: Single Quoted and Double Quoted, escape sequences, Multiline String, Concatenation operator(.), string functions(chr(), strlen(), Itrim(), rtrim(), trim(), strtoupper(), strtolower(), strcmp(), substr(), strrev(), echo(), print(), printf()), Decision Making Statements: if, if... else, if ... elseif...else, switch statement, Iterative Statements: for, while, do... while, foreach, break and continue Statement, Exit statements: exit, die, User Defined Functions: Declaring functions, function arguments(byval, byref, default arguments, variable number of arguments), return statement(by val, by ref), recursion, global scope, static variables, Dynamic Function call Arrays: Concept, Types(Numerical/List, Associative/Maps, MultiDimentional), empty array, Initialisation of arrays([] operator, array() function, range() function), inserting element in array, Display entire array(print_r(), var_dump()), Sorting functions(sort(), rsort(), asort(), arsort(), ksort(), krsort(), natsort(), natcasesort(), array_multisort(), usort()), is_array() function, mergearrays array_merge()) and using + operator, array as stack(array_push(), array_pop(), array_shift(). array_unshift()), reverse array (array reverse()), array keys() and array value(), key().

UNIT II

(15 Hours)

MySql connectivity

MySql Database:

Connect(mysql_connect()/mysqli_connect()),

Close(mysql_close()/mysqli_close()), Select a database(mysql_select_db() /mysqli_select_db()), execute mysql query and create cursor(mysql_query() /mysqli_query()), Fetch rows from tables as row(mysql_fetch_row()/ mysqli_fetch_row()) as numeric as well as associative array using cursor (mysql_fetch_array()/mysqli_fetch_array(), mysql_fetch_assoc()/, mysqli_fetch_assoc()), release memory of cursor(mysql_free_result()/ mysqli_free_result()).

Text Book/Reference book:

- 1. PHP and MySQL ByDreamtech Publications
- PHP Concepts Unleashed For Novice Vol 1-By Poornima Naik, Kavita Oza, Evincepub Publishing
- 3. PHP A Beginner's Guide Vikram Vaswami
- 4. PHP for Beginners By Ivan Bayross and SharanamShah(Shroff Publishers & Distributors)
- 5. Beginning PHP 6, Apache, MySQL Web Development- By Timothy Boronczyk,
- 6. Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Zeremy Stolz, Michael K. Glass
- 7. PHP and MySQL by Rajendra Salokhe(Aruta Publications)
- 8. Learning PHP 7 by Antonio Lopez 5.3 by Matt Doyle
- 9. Beginning PHP 9. PHP-MySQL-Dummies-3rd-edition by Janet Valade

B.Sc. Computer Science Optional (Semester–IV)(NEP2.0)(Level–5.0) Course: Subject I Major VIII

Course Title: Data Structure Using C++

Total Contact Hours: 30Hrs. (30 Lectures of 60Minutes)

TeachingScheme:Theory–02Lectures/Week Marks:50 Credits:02

Course Outcomes:

Students will be able to

Understand the basic concepts such as Data Types, Linear and NonLinear Data structures. Ability to choose appropriate data structures to represent data items in real world problems. Ability to design programs using a variety of data structures such as array, stacks, queues, linked list

Able to analyze and implement various kinds of searching and sorting techniques.

UNIT	Contents	Hours
		Allotted
	Introduction to Data Structures: Array and Stack	
	Concept of Abstract Data Types:	
	1.1.1 Definitions, Data Object, Data structure (D-Data, A-Axioms,	
	O-Operations)	
	1.1.2Classification (Primitive, Non-Primitive, Linear, Non-Linear)	
	Sorting:	
	1.2.1Definition	
	1.2.2 Stable-Unstable Sorting	
	1.2.3 Adaptive-Non Adaptive Sorting	
	1.2.4 Order of Sorting (Increasing, Decreasing, Non Increasing, Non	
	Decreasing)	15
01	1.3 Sorting Techniques: Bubble sort, Selection sort, Insertion sort,	15
	Quick sort	
	1.4 Searching: Linear and Binary Search	
	1.5 Stack:	
	1.5.1 Definition	
	1.5.2 Operations (Push, Pop, Peek, Isfull, Isempty),	
	1.5.3 Implementation using array	
	1.6 Applications of stack: Well-Parentheses, Expression Evaluation -	
	Notations: Infix, Prefix, Postfix,	
	Conversion from Infix to Postfix and Infix	
	to Prefix)	

	Queue, Linked List and Trees	
02	 2.1Queue 2.1.1 Definition of queue 2.1.2 Operations (Enqueue, Dequeue, Peek, Isfull, Isempty) 2.1.3 Types of queue (Linear, Circular, Priority) 2.1.4 Implementation Linear Queue using array (Compaction) 2.1.5 Applications of Queue 2.2 Linked List: 2.2.1 Concept of linked list 2.2.2 Types of Linked List (Singly-Doubly, Linear-Circular) 2.2.3 Implementation of Linked list 2.4 Operations on linear linked list (Insertion, Deletion, Display, Search) 2.3 Trees: 2.3.1 Definition 2.3.2 Terminologies (Root, Child, Parent, Siblings, Descendant, Ancestor, Leaf/External node, Branch node/Internal node, Degree, Edge, Path, Level, Depth, Height of node, Height of tree, Forest) 2.3.3Binary Tree – Definition, Types (Full/Proper/Plane, Complete, Perfect, Skewed, Balanced) 2.2.4 Binary Search Tree – Definition, Representation 2.2.5 Tree Traversal:Preorder, Inorder, Postorder 	15

Text Books / Reference Books:

Data Strucure using C++ by E Balagurusamy Data Strucure using C and C++ byRajesh Shukla Data Strucure using C and C++ by Tanenbaum Data Strucure using C++ by Yashwant Kanetkar Data Strucure using C++ byD.S.Malik

B.Sc. Computer Science (Optional)(Part-II) (Semester-IV)(NEP 2.0) Major Practical- III Computer Science Practical based on Major VII Lab Course based on PHP and MySQL Using OOP'S Teaching Scheme:Practical-4 Lectures/Week/batch Credits:02 Total Marks: 50

List of Practical:

Following is a sample list of assignments for practical, instructors are advised to provide more lab assignments to students to meet the course specified outcomes.

(Practic	B.Sc. Computer Science (Optional) (Part-II) (Semester-IV) Practical-IV al based on Major VII& VIII- PHP and MySQL Using OOP'S andDataStructure Using C++)
Sr. No.	Nameofthe Practical
1	Design a web page to input temperature in degree Celsius. Convert the temperature to degree
	Fahrenheit using PHP script
2	Design a web page to input a number. Using PHP script check whether given
	number is Odd/Even
3	Design a web page to input a number. Using PHP script check whether given number is
	Palindrome/Armstrong and display message in Web page accordingly.
4	Design a web page to accept a number. Using PHP script check whether given number is
	Prime or Not
5	Write a PHP script that will display array elements, smallest element in array, largest element
	in array and Sum of elements of array. (Use hard coded array)
6	Write PHP script to display "n" terms of Fibonacci series using user defined function.
7	Write PHP script to display factorial of natural number using user defined function.
8	Create Employee database in MySQL with table EmployeeMaster (EmpId, EmpName, Emp
	Department). Create a web page having a form with the above fields, connect the web page to
	MySQL and perform Insert, Update and Delete operations through the web page.
9	Use the Employee database (Specified in Sr. No.8) and perform the following operation
	through the web page i. Display all employee details. ii. Display Employees from a specific
	department. iii. Display count of employees in a particular department.
10	Create Student Database in MySQL with the following table: StudentMaster (RollNo,
	StudentName, AdmittedClass, DateofBirth). Design a complete web form to perform CRUD
	operation on the above table

B.Sc. Computer Science (Optional)(Part-II)(Semester-III)(NEP 2.0) Major Practical- III Computer Science Practical based on Major VIII Lab Course based on Data Structure Using C++ Teaching Scheme: Practical–4 Lectures/Week/batch Credits:02 Total Marks:50

List of Practical:

Following is a sample list of assignments for practical, instructors are advised to provide more lab assignments to students to meet the course specified outcomes.

Sr. No.	Name of the Practical
	Stack And Application:(Using Array)
	i) Implementation and Operations on Stack
1	ii) Check Expression is Well-Parenthesised or not "Use [,(,{ brackets"
	iii) Conversion of infix expression to postfix and prefix "Use (only"
	Queue:(Using Array)
2	i) Implementation and Operations on Linear Queue
	ii) Implementation and Operations on Circular Queue
	Sorting:
	i) Bubble sort
3	ii)Insertion sort
	iii)Selection sort
	iv)Quick Sort(recursive function)
	Searching:
4	i) Linear Search
	ii) Binary Search
	Linked List:
_	i) Implementation and Operations on Linear Linked List
5	ii) Implementation and Operations on Circular Linked List(Use Count)
	iii) Implementation and Operations on Circular Linked List
	Stack ,Queue and Binary Search Tree using Linked List:
6	i) Implementation and Operations using Linear Linked List on Stack
	ii) Implementation and Operations using Linear Linked List on Queue

B.Sc. Computer Science Optional (Semester–IV)(NEP2.0) (Level5.0) Course: Subject I Major VI

Course Title: OE-IV (T/P) Basic C Programming Total Contact Hours: 30 Hrs. (30 Lectures of 60 Minutes) Marks:50 Credits:02

Sr. No.	Nameofthe Practical
1	Converting degrees Celsius to Fahrenheit and vice versa?
2	Display three input numbers in sorted (non-decreasing) order?
3	Given a positive integer value n (≥ 0) display number, square and cube of numbers from 1 to n in a tabular format?
4	Given an input positive integer number, display odd numbers from in the range[1,n]?
5	Display first mathematical tables, each table up to 10 rows? Generalize this to display first n (> 0) mathematical tables up to m (m > 0) rows?
6	Display the first n $(n > 0)$ terms of the fibonacci sequence?
7	Given two positive integer numbers n1 and n2 check if the numbers are consecutive numbers of the fibonacci sequence
8	Extract digits of an integer number (left to right and right to left)?
9	Check if a given positive integer number is a palindrome or not?
10	Compute character grade from the marks ($0 \le \text{marks} \le 100$) of a subject. Grading Scheme: 80-100 : A, 60 - 79: B, 50 - 59: C, 40-49: D, 0-39: F? Solve this using both else-if ladder and switch case?
11	Check if a given positive integer number Armstrong number or not
12	Compute prime factors of a positive integer number

B.Sc. Computer Science Optional (Semester–IV)(NEP2.0) (Level–5.0) Course: Subject I Major VI

Course Title: SEC-II(T/P)Basics of Python Programming
Total Contact Hours: 30 Hrs. (30 Lectures of 60 Minutes)Teaching Scheme:Theory-02Lectures/WeekMarks:50Credits:02

Sr. No.	Name of the Practical
1	Program to display name and address.
2	Program to Accept two number and display addition, subtraction, multiplication, division and modules.
3	Program to calculate factorial of given number.
4	Display the first n $(n > 0)$ terms of the fibonacci sequence
5	Extract digits of an integer number (left to right and right to left)
6	Check if a given positive integer number is a palindrome or not
7	Compute character grade from the marks ($0 \le \text{marks} \le 100$) of a subject. Grading Scheme: 80-100 : A, 60 - 79: B, 50 - 59: C, 40-49: D, 0-39: F? Solve this using both else-if
8	Check if a given positive integer number Armstrong number or not
9	Compute prime factors of a positive integer number

Course: AEC-II Course Title: Soft Skills Total Contact Hours: 30Hrs. (30 Lectures of 60 Minutes) Marks:50

Course Outcomes:

The course will enable students to;

To empower the students towards general and technical writing, oral communications.
 To empower listening skills: letter writing, technical report writing, and business communication.

UNIT 1

(15 Hour)

(15 Hour)

Credits:02

Expression: Practical communication skill development, business presentation with multimedia, speaking skill, prepared speech, extempore speech

UNIT 2

Writing: Technical/business letter, Resume Preparation, organisation of writing material, poster presentation, writing technical document, preparing software user manual, preparing project documentation.

Reference Books:

- 1. Business Correspondence & Report Writing, Sharma, TMH
- 2. Business Communication Strategies, Monipally, TMH
- 3. English for Technical communication, Laxminarayanan, Scitech
- 4. Business Communication, Kaul, PHI
- 5. Communication Skill for Effective Mgmt., Ghanekar, EPH

B.Sc. Computer Science (Optional) (Semester – IV) (NEP 2.0) (Level – 5.0) Course: VEC-II Course Title: Environment Studies Total Contact Hours: 30 Hrs. (30 Lectures of 60 minutes) Marks: 50 Credits: 02

• To be taken from Environmental Science BoS

B.Sc. Computer Science (Optinal)(Semester – IV) (NEP 2.0) (Level – 5.0) Course: CEP-I

Title of course: CEP-I: Field work

• Field work as per NEP 2.0 (CEP, CC), University circular enclosed



संदर्भ क. : शिवाजी वि./अ.म./400 प्रति,

दिनांक : 15/07/2024

- मा. प्राचार्य / संचालक, सर्व संलग्नित महाविद्यालये / मान्यताप्राप्त संस्था, शिवाजी विद्यापीठ, कोल्हापूर
- मा. अधिविभाग प्रमुख, सर्व अधिविभाग, शिवाजी विद्यापीठ, कोल्हापूर

विषय : राष्ट्रीय शैक्षणिक धोरण, 2020 (NEP 2.0) नुसार CEP, CC अभ्यासकमाबाबत.

महोदय / महोदया,

उपरोक्त संदर्भिय विषयास अनुसरुन आपणास आदेशान्वये कळविण्यात येते की, राष्ट्रीय शैक्षणिक धोरण २०२० (NEP 2.0) नुसार शैक्षणिक वर्ष २०२४—२५ पासून लागू करण्यात आलेल्या सर्व पदवी कोर्सला लागू असणा—या Community Engagement Programme (CEP), Co-Curricular Courses (CC) अभ्यासक्रम/त्याची नियमावली सोबत पाठवित आहे.

सदर Community Engagement Programme (CEP), Co-Curricular Courses (CC) अभ्यासकमाच्या प्रती जोडल्या आहेत. तसेच विद्यापीठाच्या <u>www.unishivaji.ac.in</u>,NEP-2020@suk (Online Syllabus) या संकेतस्थळावर ठेवण्यात आल्या आहेत.

सदर अभ्यासकम/त्याची नियमावलीची सर्व संबंधित विद्यार्थी व शिक्षकांच्या निदर्शनास आणून द्यावेत ही विनंती.

कळावे,

विश्वास. (ड कुबल) उपकुलसचिव

सोबत : अभ्यासकमाची प्रत.

प्रत : माहितीसाठी व पुढील योग्यत्या कार्यवाहीसाठी

अधिष्ठाता, सर्व विद्याशाखा	पात्रता विभागास
अध्यक्ष, सर्व अभ्यास व अस्थायी मंडळे	पी.जी. सेमिनार विभागास
संचालक, परीक्षा व मुल्यमापन मंडळ कार्यालयास	पी.जी. प्रवेश विभागास
परिक्षक नियुक्ती ए व बी विभागास	संलग्नता टी. १ व टी २ विभागास
दूरस्थ व ऑनलाईन शिक्षण विभागास	नॅक विभागास
संगणक केंद्र/आय. टी. सेल विभागास	सर्व ऑन परीक्षा विभागास

SHIVAJI UNIVERSITY, KOLHAPUR



Established: 1962

 $A^{\scriptscriptstyle ++}$ Accredited by NAAC (2021) With CGPA 3.52

New Syllabus For

Community Engagement Programme (CEP)

All Bachelor Degree Programme

STRUCTURE AND SYLLABUS IN ACCORDANCE WITH *NATIONAL EDUCATION POLICY - 2020* HAVING CHOICE BASED CREDIT SYSTEM WITH MULTIPLE ENTRY AND MULTIPLE EXIT OPTIONS

(TO BE IMPLEMENTED FROM ACADEMIC YEAR 2024-25 ONWARDS)

Community Engagement Programme (CEP):

1. INTRODUCTION:

New generation of students are increasingly unaware of local rural and peri-urban realities surrounding their HEIs, as rapid urbanization has been occurring in India. A large percentage of Indian population continues to live and work in rural and peri-urban areas of the country. While various schemes and programs of community service have been undertaken by HEIs, there is no singular provision of a well- designed community engagement course that provides opportunities for immersion in rural realities. Such a course will enable students to learn about challenges faced by vulnerable households and develop an understanding of local wisdom and lifestyle in a respectful manner

2. OBJECTIVES:

- To promote a respect for rural culture, lifestyle, and wisdom among students.
- To learn about the present status of agricultural and development initiatives.
- Identify and address the root causes of distress and poverty among vulnerable households.
- Improve learning outcomes by applying classroom knowledge to real-world situations.

To achieve the objectives of the socio-economic development of New India, HEIs can play an important role through active community engagement. This approach will also contribute to improve the quality of both teaching and research in HEIs in India. India is a signatory to the global commitment for achieving Sustainable Development Goals (SDGs) by 2030. Achieving these 17 SDG goals requires generating locally appropriate solutions. Community engagement should not be limited to a few social science disciplines alone. It should be practiced across all disciplines and faculties of HEIs. These can take the forms of enumerations, surveys, awareness camps and campaigns, training, learning manuals/films, maps, study reports, public hearings, policy briefs, cleanliness and hygiene teachings, legal aid clinics, etc. For example, students of chemistry can conduct water and soil testing in local areas and share the results with the local community. Students of science and engineering can undertake research in partnership with the community on solid and liquid waste disposal Therefore, students are being encouraged to foster social responsibility and community engagement in their teaching and research.

3. LEARNING OUTCOMES:

After completing this course, students will be able to

- Gain an understanding of rural life, Indian culture, and social realities.
- Develop empathy and bonds of mutuality with the local community.
- Appreciate the significant contributions of local communities to Indian society and economy.
- Learn to Value local knowledge and wisdom.
- Identify opportunities to contribute to the community's socioeconomic improvement.
- 4. Credits: Two credit Course; Students are expected to complete 60 hours of participation

5. COURSE STRUCTURE:

Sr.	Module Title	Module Content	Teaching/Learning/Methodology
1	Appreciation	Rural lifestyle, rural society, joint family, caste and	Classroom discussionsField visit
	of Rural	gender relations, rural values with respect to community,	Individual /Group conference
	Society	rural culture nature and public resources, ponds and	Report/journal submission &
		fisheries, elaboration of soul of India lies in villages'	VIVA
		rural infrastructure,	
2	Understandin	Agriculture, farming, land ownership, water management,	Classroom discussionsField visit
	g rural and	animal husbandry, non-farm livelihood and artisan's rural	Individual /Group conference
	local	entrepreneurs, rural markets, migrant labour, social	Report/journal submission &
	economy and	innovation projects	VIVA
	livelihood		
3	Rural	Traditional rural and community organization, self-help	Classroom discussionsField visit
	an	groups, decentralized planning, panchayat raj institutions	Individual /Group conference
	d local	Gram panchayat, Nagarpalika and Municipalities, local	Report/journal submission &
	Institution	Civil Society, Local administration, National rural,	VIVA
		Livelihood Mission [NRLM], Mahatma Gandhi National	
		Rural Employment. Guarantee [MGNREGA].	
4	Rural	History of rural development and current National	Classroom discussionsField visit
	an	Programms in India: Sarva shiksha Abhiyan, Beti Bachao-	Individual /Group conference
	d National	Beti Padhao, Ayushman Bharat, eShram	Report/journal submission &
	development	Swachh Bharat, PM Awas yojana, Skill India, Digital	VIVA
	programmers	India, Start-Up India, Stand-Up India, Scheme of Fund	
		for Regeneration of Traditional Industries (SFURTI), Jal	
		Jeevan Mission, Mission Antyodaya, ATMANIRBHAR	
		Bharat, etc	

Note: Faculty can make addition in the list of activities as per domain content:

Recommended field-based activities (Tentative):

- □ Participate in Gram Sabha meetings, and study community participation;
- □ Visit to Swachh Bharat Mission project sites, conduct analysis and initiate problem solvingmeasures;
- □ Interaction with Self Help Groups (SHGs) women members, and study their functions and challenges; planning for their skill-building and livelihood activities;
- □ Visit Mahatma Gandhi National. Rural Employment Guarantee Act 2005 (MGNREGS) project sites, interact with beneficiaries and interview functionaries at the work site;
- □ surveys on Mission Antyodaya to support under Gram Panchayat Development Plan
- Visit Rural Schools/mid-day meal centres, study academic and infrastructural resources, digital divide and gaps;
- □ Associate with Social audit exercises at the Gram Panchayat level, and interact with programme beneficiaries;
- □ Visit to local Nagarpalika office and review schemes for urban informal workers and migrants;
- □ Attend Parent Teacher Association meetings, and interview school drop outs;
- □ Visit local Anganwadi and observe the services being provided;
- □ Visit local NGOs, civil society organisations and interact with their staff and beneficiaries;
- □ Organize awareness programmes, health camps, Disability camps and cleanliness camps;
- □ Conduct soil health test, drinking water analysis, energy use and fuel efficiency surveys and building solar powered village;
- □ Understanding of people's impacts of climate change, building up community's disaster preparedness;
 - □ Organise orientation programmes for farmers regarding organic cultivation, rational use of irrigation and fertilizers, promotion of traditional species of crops and plants and awareness against stubble burning;
 - □ Formation of committees for common property resource management, village pond maintenance and fishing;
 - □ Identifying the small business ideas (handloom, handicaraft, khadi, food products, etc.) for rural areas to make the people self-reliant.
 - □ Interactive with local leaders, panchayat functionaries, grass-root officials and local institutions regarding village development plan preparation and resource mobilization;

- □ Financial Literacy Awareness Programme
- Digital Literacy Awareness Programme
- □ Education Loan Awareness Programme
- □ Entrepreneurship Awareness Programme
- □ Awareness Programmes on Government Schemes
- □ Products Market Awareness
- □ Services Market Awareness
- □ Consumer Awareness Programme
- □ Accounting Awareness Programme for Farmers
- □ Accounting Awareness Programme for Street Vendors etc.

6. IMPORTANT RULES AND REGULATIONS FOR CEP:

Concurrent Fieldwork:

Students must conduct comprehensive studies on various challenges that they face in their chosen field. Every work relevant to the subject matter should be compiled and documented.

Students should keep separate fieldwork diary or maintain journal in order to record their fieldwork experiences i.e. reading, e- contents, tasks, planning and work hours have to be recorded in the diary. Detailed work records report on students' fieldwork experiences and activities to be submitted and should be presented. The fieldwork conference is part of the timetable and is mandatory. Faculty should hold a fieldwork conference FOREIGHTNIGHTLY for all students.

In addition to the principal curriculum, the students engage in a variety of community development- related activities. They are encouraged to plan and carry out programs, processions, and events for social causes. These activities seek to enhance students' personal and professional skills as well as foster self- development. "Rural Camp" should be embedded in the curriculum for first-year students to be held in the backward and neglected areas of District's

Concurrent Fieldwork is the core curriculum activity in the CEP course. Hence, 100% attendance of the students is mandatory in case of absence on any student, supplementary fieldwork must be arranged and accomplished with the approval of the faculty supervisor.

7. EVALUATION/ASSESSMENT SCHEME:

Students should keep a Field Diary / journal to record, content, readings and field visit planning. The assessment pattern is internal and external i.e. 40+10.

Internal continuous Assessment: Participation in concurrent field visits 40%; individual/group field project conference, report/journal submission 40%.

External Assessment: Presentation of field project findings (VIVA) should be assigned 20%.