

Shri Acharyaratna Deshbhooshan Shikshan Prasarak Mandal's
MahavirMahavidyalaya, Kolhapur
(Autonomous)

Affiliated to Shivaji University, Kolhapur



Accredited by NAAC with 'A' Grade

Syllabus for Choice Based Credit System (NEP-2.0)
Bachelor of Science (B.Sc.) Programme

Part	II	Course	Computer Science
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Under the Faculty of Science

(To be introduced from Academic Year 2024 – 25 onwards)
Subject to the revisions & modifications made from time to time)

MahavirMahavidyalaya, Kolhapur(Autonomous)
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(New syllabus under Autonomy to be introduced from June, 2022 onwards)

Primary Information:			
Programme	Bachelor of Science (B.Sc.) NEP 2.0		
Course	Computer Sci.	Course Type	Semester
Part	II	Semester	III
Paper No.	V	Course Code	DSC H5
Total Credits	02	Total Marks	50
Paper No.	VI	Course Code	DSC H6
Total Credits	02	Total Marks	50
Implementation	2022– 23	Contact Hours	05 / Week

Primary Information:			
Programme	Bachelor of Science (B.Sc.) NEP 2.0		
Course	Computer Sci.	Course Type	Semester
Part	II	Semester	IV
Paper No.	VII	Course Code	DSC H7
Total Credits	02	Total Marks	50
Paper No.	VIII	Course Code	DSC H8
Total Credits	02	Total Marks	50
Implementation	2022 – 23	Contact Hours	05 / Week

- **STRUCTURE OF COURSE**

Sr. No.	Paper	Name of Paper	Marks
Computer Science (Semester III)			
1	DSC H5	Web Programming	50(40+10) 40 : ESE 10 : CIE
2	DSC H6	Object Oriented Programming Using C++	50(40+10) 40 : ESE 10 : CIE
Computer Science (Semester IV)			
3	DSC H7	PHP & MySQL	50(40+10) 40 : ESE 10 : CIE
4	DSC H8	Data Structure Using C++	50(40+10) 40 : ESE 10 : CIE
Practical(End Semester)			
5	Practical Paper –III	Computer Science Practical Paper Based On DSC H5,DSC H6	50Marks
6	Practical Paper –IV	Computer Science Practical Paper Based On DSC H7, DSC H8	50Marks

B.Sc. Part –II Computer Science Optional (Semester– III)

Course Code: DSC-H5 Computer Paper –V

Course Title: Web Programming

Total Contact Hours: 36 Hrs. (45 Lectures of 48 Min.)

Teaching Scheme: Theory – 03 Lect. / Week

Credits: 02

Total Marks: 50

Course Outcomes:

Students will be able

1. To learn basic tags used in HTML
2. To develop their own cascading sheets.
3. To understand basic concept of PHP.

Course Syllabi:

(CR = Credits / IH: Instructional Hours)

Modules	CR	IH
Module I : Introduction to HTML and CSS		
1.1 Html Basic- Heading, formatting, paragraph, Comments 1.3 HTML tags and attributes-HTML fonts, color, table, list 1.4 HTML form elements-input tag, layout. 1.5 HTML5 attributes, events,canvas, audio and video. 1.6 Introduction of CSS, advantages and limitation of CSS, syntax 1.7 types of CSS, CSS properties	01	16
Module II : Introduction to PHP		
2.1 Introduction: Evaluation, Features, PHP Script(PHP tags <?php... ?>, echo command, PHP script execution on terminal and web browser. 2.2 Variables: 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()) 2.3 · Constant: define() function to define constant, constant() to retrieve value of constant, difference between constant and variable, PHP	01	20

<pre>predefined constants</pre> <p>2.4 Operators: Arithmetic, Comparison, Relational, Assignment, Increment-Decrement, Ternary, Bitwise, Casting, Other operators (., \$, @, {}, ` , =>)</p> <p>2.5 Strings: Single Quoted and Double Quoted, escape sequences, Multiline String, Concatenation operator(.), string functions(chr(), strlen(), ltrim(), rtrim(), trim(), strtoupper(), strtolower(), strcmp(), substr(), strrev(), echo(), print(), printf())</p> <p>2.6 Decision Making Statements: if, if... else, if ... elseif...else, switch statement</p> <p>Iterative Statements: for, while, do... while, foreach, break and continue statement</p> <p>2.7 Exit statements: exit, die</p>		
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- Reference Books

1. Complete HTML- Thomas Powell
2. Introducing HTML5- BruceLawson,RemySharp
3. HTML Blackbook- Steven Holzner
4. PHP Concepts Unleashed For Novice – Vol I – By Poornima Naik, Kavita Oza, Evincepub Publishing
5. PHP A Beginner’s Guide – Vikram Vaswami
6. PHP 5.1 for Beginners – By Ivan Bayross and Sharanam Shah(Shroff Publishers &Distributors)

- **Practical Based on DSC H5:**

Use “Problem Solving Techniques” For Following problems and implement code through PHP programming language. It include: Problem Analysis, Algorithm, Flowchart, Source Code with Output.

1.	Program based on Html text formatting tag
2.	Program based on Html List, Table tag
3.	Program based on HTML5 Tag (Audio, video, canvas)
4.	Program based on HTML5 form Tag
5.	Program based on CSS and CSS Types
6.	Program Based on HTML form Tags.
7.	Program based on Operators
8.	Program based on Decision Making Statements
9.	Program based on iterative statement

Course Code: DSC-H6 Computer Paper –VI**Course Title: Object Oriented Programming Using C++****Total Contact Hours: 36 Hrs. (45 Lectures of 48 Min.)****Teaching Scheme: Theory – 03 Lect. / Week****Credits: 02****Total Marks: 50****Course Outcomes:**

Perform object oriented programming to develop solutions to problems demonstrating usage of controlStructures, modularity, I/O and other standard language constructs.

Students will be able

1. To understand how C++ improves C with object oriented features
2. To learn syntax and semantics of C++ programming language.
3. To learn how to overload functions and operators in C++.
4. To learn how to design C++ classes for code reuse.
5. To learn how inheritance and virtual functions implement dynamic binding with polymorphism.

Course Syllabi:

(CR = Credits / IH: Instructional Hours)

Modules	CR	IH
Module I : Introduction to C++ and Object Oriented Programming		
1.1 Some Concepts: Procedure Oriented programming versus Object oriented programming, Benefits of C++ over C Language 1.2 Object oriented programming Concepts: Object, class, Encapsulation, Abstraction, Polymorphism, Inheritance. 1.3 Basics of C++ :Terminology-Tokens, Keywords, Identifiers, constants, Basic data types, Variables : Definition, Declaration, Initialization, Dynamic Initialization and reference variables Structure of C++ program, Input and output streams. 1.4 Operators in C++: Dynamic Memory allocation (New and Delete), scope resolution operator, manipulators (setw, endl, setprecision). 1.5 Functions: Prototyping, Function Call, default arguments, const arguments, inline function. 1.6 Classes and objects : Definitions, class declaration, Access modifiers : private, public and protected, Member function, Defining member functions (Inside and outside the class), object definition, Array of objects, passing object as parameter, static	01	20

members(data members and member accessing function)		
1.7 Constructors: Definition, types- Default constructor, Copy constructor, Parameterized constructor, Destructors.		
1.8 Friend function and friend class.		
Module II : Inheritance and Polymorphism		
2.1 Inheritance: Introduction, Defining base and derived class. Types of Inheritance (single, multilevel, multiple, hierarchical, hybrid), Introducing protected members, virtual base class		
2.2 Polymorphism: Definition, Types of polymorphism.		
2.3 Function Overloading		
2.4 Operator overloading: Concept, Rules, definition of operator function, Overloading unary and binary operators.	01	16
2.5 Virtual and pure-virtual functions (abstract class),rules for virtual functions,		

- 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. C++ Programming – D. Ravichandran
5. A Tour of C++ (2nd Edition) – Bjarne Stroustrup.
6. The C++ Programming Language (4th Edition) – Bjarne Stroustrup.

- **Practical Based on DSC H6 :**

Use “Problem Solving Techniques” For Following problems and implement code through C++programming language. It include: Problem Analysis, Algorithm, Flowchart, Source Code with Output.

First introduce Linux Operating System, GPU commands, C++ compilation process and components(cpp, g++, as only)with simple program and Debugging.

1.	Program based on basic concept of C++.
2.	Program based on concept of function with default arguments.
3.	Program based on concept of C++ class and objects.
4.	Program based on concept of Array of object.

5.	Program based on concept of static data member and static function.
6.	Program based on concept of constructor and destructor.
7.	Program based on concept of friend function and friend class.
8.	Program based on concept of Inheritance.
9.	Program based on concept of Function Overloading.
10.	Program based on concept of Operator Overloading.
11.	Program based on concept of Pure virtual function.

B.Sc. Part –II Computer Science Optional (Semester– IV)

Course Code: DSC-H7 Computer Paper –VII

Course Title: Php & MySQL

Total Contact Hours: 36 Hrs. (45 Lectures of 45 Min.)

Teaching Scheme: Theory – 03 Lect. / Week

Credits: 02

Total Marks: 50

Course Outcomes:

Students will be able

1. To Learn how to developing applications in PHP using MySQL.
2. To learn and develop various PHP technology applications that definitely meets the Currentindustry needs.

Course Syllabi:

(CR = Credits / IH: Instructional Hours)

Modules	CR	IH
Module I : Php Array and Function		
1.1 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 1.2 Arrays: Concept, Types(Numerical/List, Associative/Maps, Multi-Dimensional), empty array, Initialization of arrays([] operator, array() function, range() function), inserting element in array, Display entire array(print_r(), var_dump()) 1.3 Forms get & post methods. PHP super global variables (\$_PHP_SELF, \$_GET, \$_POST, \$_SERVER, \$_COOKIES, \$_REQUEST) 1.4 Session and Session variables 1.5 Form Validation	01	18
Module II : MySql connectivity		
2.1 Connect, Close, Select a database 2.2 execute MySQL query. 2.3 create cursor, Fetch rows from tables as row as numeric as well as associative array 2.4 cursor ,release memory of cursor(mysql_free_result() mysqli_free_result()) 2.5 Data backup and restore.	01	18

- Reference Books
 1. PHP and MySQL By Dreamtech Publications
 2. PHP and MySQL for dummies by Janet Valade
 3. PHP A Beginner's Guide – Vikram Vaswami
 4. PHP 5.1 for Beginners – By Ivan Bayross and Sharanam Shah(Shroff Publishers & Distributors)
 5. Programming PHP by RasmusLerdorf, Kevin Tatroe

• **Practical Based on DSC H7 :**

Use “Problem Solving Techniques” For Following problems and implement code through PHP programming language. It include: Problem Analysis, Algorithm, Flowchart, Source Code with Output.

1.	Program based on Array
2.	Program based on String.
3.	Program based on function
4.	Program based on validation function
5.	Program based on get method , post method.
6.	Program based on session, cookies
7.	Program based on connect MySql database.
8.	Program based on manipulate data in a table using php
9.	Program based on display content of table using php

B.Sc. Part –II Computer Science Optional (Semester– IV)

Course Code: DSC-H8 Computer Paper –VIII

Course Title: Data Structure Using C++

Total Contact Hours: 36 Hrs. (45 Lectures of 45 Min.)

Teaching Scheme: Theory – 03 Lect. / Week

Credits: 02

Total Marks: 50

• **Course Outcomes:**

Students will be able to

1. Understand the basic concepts such as Abstract Data Types, Linear and Non Linear Data Structures.
2. Ability to choose appropriate data structures to represent data items in real world problems.
3. Ability to analyze the time and space complexities of algorithms.
4. Ability to design programs using a variety of data structures such as array, stacks, queues, linkedlist etc.
5. Able to analyze and implement various kinds of searching and sorting techniques

Course Syllabi:

(CR = Credits / IH: Instructional Hours)

Modules	CR	IH
Module I : Introduction to Data Structure and Array		
1.1 Concept of Data, Data Object, Types of Data- Atomic Data, Non-atomic Data 1.2 Concept of Data Structure 1.3 Abstract data type (ADT) 1.4 Array : Definition, Array Operations, Types of Array, Applications of Array(Polynomial evaluation and addition of two polynomials) 1.5Algorithm Analysis : Space complexity, time complexity, Asymptotic notation (Big O, Omega Ω , Theta Θ) 1.6 Searching: Linear and Binary Search 1.7 Sorting : Bubble sort, Selection sort, Insertion sort, Quick sort	01	16
Module II : Linear and Non Linear Data Structure		
2.1 Stack : Concept of Stack, Operations on Stack(push, pop, peek ,isfull, isempty), implementation of Stack using array, Applications of Stack- Recursion, Infix, Prefix, Postfix, conversion from Infix to Prefix and Infix to Postfix 2.2 Queue : Concepts of queue, Operations on Queue (Enqueue, Dequeue, Peek, Isfull, Isempty), Implementation of queue using array, Types of Queue (Linear, Circular and Priority), Applications of Queue. 2.3 Linked List : Concept of linked list, Types of Linked List (Singly-Doubly, Linear-Circular),Implementation of Linked list, Operations on linked list (Insertion, Deletion, Display, Search) 2.4 Trees: Definition, 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) Binary Tree: Definition, Types (Full/Proper/Plane, Complete, Perfect, Skewed, Balanced),Binary Search Tree.	01	20

- **Reference Books**

1. Data Structure using C and C++ -Rajesh Shukla
2. Data Structure using C and C++ - Tanenbaum
3. Data Structure using C++ - E Balagurusamy
4. Data Structure using C++ - Yashwant Kanetkar
5. Data Structure using C++ - D.S.Malik

- **Practical Based on DSC H8 :**

Use “Problem Solving Techniques” For Following problems and implement code through C++programming language. It include: Problem Analysis, Algorithm, Flowchart, Source Code with Output.

1.	Program to implement polynomial for given value.
2.	Program to implement searching technics (Linear and Binary).
3.	Program to implement sorting techniques(Bubble sort, Insertion sort, Quick sort, Selection sort)
4.	Program to implementation and Operation on stack
5.	Program to implementation and Operation on queue.
6.	Program to implementation and Operation on Circular queue.
7.	Program to implementation and Operation on Priority queue.
8.	Program to implementation and Operation on Linear Linked List.
9.	Program to implementation and Operation on Circular Linked List.
10.	Program to implementation and operation on Tree.

• **End Semester Examination Question Paper Pattern : 40 Marks**

Q.No.	Nature /Type of Question	Marks	Total
1.	Multiple Choice Question (06)	Each for 01 Marks	06
2.	Short Answers(5)	Each for 02 Marks	10
3.	Solve Any 4 out of 6	Each for 03 Marks	12
4.	Solve Any 1 out of 2	Each for 06 Marks	06
5.	Solve Any 1 out of 2	Each for 06 Marks	06
Total			40

• **Continuous Internal Evaluation(CIE) Pattern : 10 Marks**

- MCQ test
- Unit Test
- Seminars

Any one from above for CIE

• **End Semester Practical Examination**

The practical examination in Computer Science is conducted at end of semester which will be

1. Practical Question Paper III and IV For B.Sc. II will be of maximum 50 marks each
2. Practical Paper III based on Course DSC H5 and DSC H6
3. Practical Paper IV based on course DSC H7 and DSC H8 of 3 hours duration and of 50 maximum marks.

• **Nature of Practical Examination:**

Paper Name	Practical Paper -III and IV
Total No. Of Questions	04
No. Of questions should be attempt	02
Each Question	20 Marks(Total 40 Marks)
Certified Journal	5Marks
Viva Based on Practical	5 Marks
Total Marks	50

