UNIVERSITY OF MYSORE

Estd. 1916

VishwavidyanilayaKaryasoudha
Crawford Hall, Mysuru- 570 005

No.AC2(S)/55/2024-25

Dated: 20.07.2024

Notification

Sub:-Syllabus and Scheme of Examinations of Computer Science (UG) programme (I & II Semester) from the Academic year 2024-25.

Ref:- 1. Decision of Board of Studies in Computer Science (CB) meeting held on 06-06-2024.
2. Decision of the Faculty of Science & Technology meeting held on 19-06-2024.
3. Decision of the Academic Council meeting held on 28-06-2024.

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The Board of Studies in Computer Science (CB) which met on 06-06-2024 has resolved to recommend & approved the Syllabus and Scheme of examinations of Computer Science (UG) programme (I & II Semester) with effect from the Academic year 2024-25.

The Faculty of Science & Technology and Academic Council at their meetings held on 19-06-2024 and 28-06-2024 respectively has also approved the above said Syllabus and Scheme of examinations hence it is hereby notified.

The Syllabus and Scheme of Examinations content may be downloaded from the University Website i.e., www.uni-mysore.ac.in.

Registrar

Registrar
University of Mysore
Mysore

To:-

1. All the Principal of affiliated Colleges of University of Mysore, Mysore.
2. The Registrar (Evaluation), University of Mysore, Mysuru.
3. The Chairman, BOS/DOS in Computer Science, Manasagangothri, Mysore.
4. The Dean, Faculty of Science & Technology, DOS in Mathematics, MGM.
5. The Director, Distance Education Programme, Moulya Bhavan, Manasagangotri, Mysuru.
6. The Director, PMEB, Manasagangothri, Mysore.
7. Director, College Development Council,Manasagangothri, Mysore.
8. The Deputy Registrar/Assistant Registrar/Superintendent, Administrative Branch and Examination Branch, University of Mysore, Mysuru.
9. The PA to Vice-Chancellor/ Registrar/ Registrar (Evaluation), University of Mysore, Mysuru.
10. Office Copy.

B.Sc.

Computer Science

First and Second Semester Syllabus (SEP) 2024

University of Mysore

Curriculum

Program: B.Sc.
Subject: Computer Science

Semester	Course No.	Theory/ Practical	Credits	L-T-P	No. of Hours	Course Title	Marks	
							SEE	CIE
I	CSM11T	**Theory**	03	3-0-0	03	Computer Concepts and Problem-Solving using C++	80	20
	CSM11P	**Practical**	02	0-0-2	04	Computer Basics and Programming in C++	40	10
II	CSM21T	**Theory**	03	3-0-0	03	Data Structures	80	20
	CSM21P	**Practical**	02	0-0-2	04	Data Structures using C++	40	10

Semester: I

Course Code: CSM11T	**Course Title:** Computer Concepts and Problem-solving using C++
Course Credits: 03 (3-0-0)	**Hours/Week:** 03
Total Contact Hours: 44	**Formative Assessment Marks:** 20
Exam Marks: 80	**Exam Duration:** 03

Course Outcomes (COs):
On successful completion of this course, students will be able to:
1. Understand the basics of computer.
2. Understand problem-solving strategies and techniques.
3. Describe the Object-Oriented Programming principles and concepts.
4. Understand of the syntax and semantics of the C++.

Course Contents

Unit-1	
Introduction To Computers: Definition And Characteristics Of Computers, Brief History Of Computers, Classification Of Computers Based On Size And Processing Ability. Applications Of Computers. **Computer Architecture:** CPU, ALU, Control Unit, Registers, Cache Memory, RAM, ROM, Input/Output Components, Buses, Ports. Hardware And Software: System Software [Operating System, Interpreters], Application Software. Languages Of Computer, ASCII And EBCDIC, Computer Threats And Safety Measurements.	11 Hours
Unit-2	
Problem Solving Techniques: Problem, Definition, Analysis, Design Tools [Algorithm & Flow Chart], Coding, Testing, Maintenance. Basics of Algorithm Analysis: Time Complexity, Space Complexity, Asymptotic Notations. **Basic Programming Concepts:** Tokens of Programming Language, Identifier, Constant, Variable, Data Types, And Operators. Introduction to Programming Concepts. Comparison of POP And OOP.	11 Hours
Unit-3	
Introduction To C++: Overview Of Programming Languages, History and Features of C++, Structure of C++ Program, Data Types in C++. Control Structures: Decision Making: If, If-Else, Nested If, Switch Statement. Looping: While, Do-While, For. Unconditional Statements: Break And Continue Statements.	11 Hours

Access Specifiers: Public, Private, Protected. Pointers In C++.	
Unit-4	
Objects, Classes: Base And Derived Classes, Data Encapsulation ,Data Abstraction, Friend Function, Inheritance: Single, Multiple, Multilevel, Hierarchical. **Polymorphism:** Function Overloading, Operator Overloading, Virtual Functions. **Constructors And Destructors:** Exception Handling.	11 Hours

Reference:

1. "Programming: Principles and Practice Using C++" by Bjarne Stroustrup.
2. "C++ Primer" by Stanley B. Lippman, Josée Lajoie, and Barbara E. Moo.
3. "Object-Oriented Programming with C++" by E. Balagurusamy
4. "Problem Solving and Object-Oriented Programming with C++" by Tanenbaum and Mukherjee:

Course Code: CSM11P	Course Title: Computer Basics and Programming in C++
Course Credits: 02 (0-0-2)	Hours/Week: 04
Total Contact Hours: 60	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 03

Course Outcomes (COs):
On successful completion of this course, students will be able to:
1. Illustrate the hardware components of Computer.
2. Use Open-Source Office tools.
3. Demonstrate simple programming skills through C++ programming language.

Laboratory Program List
PART -A
1. demonstration of desktop computer hardware components.
2. Demonstration of Word Processor software [Open-Office].
3. Demonstration of Spreadsheet software [Open-Office].
4. Demonstration of Presentation software [Open-Office].
5. C++ program to print user name.
6. C++ program to swap 2 numbers.
7. C++ Program to find largest among 3 numbers
8. C++ program to perform arithmetic operations.

PART-B
1. C++ program to print multiplication table of a number.
2. C++ program to reverse a number.
3. C++ program to check whether a number is a palindrome or not.
4. C++ program to create a class and object.
5. C++ program for single inheritance.
6. C++ program to demonstrate multi-level inheritance.
7. C++ program to demonstrate operator overloading.
8. C++ program to demonstrate pointers.

Evaluation Scheme for Lab Examination [Marks: 40]
- **Writing:** One program from both Part A and Part B (15 Marks each): 15 x 2 = 30
- **Execution:** Any one of the written Program: 05 Marks
- **Viva:** 05 Marks

Semester: II

Course Code: CSM21T	Course Title: Data Structures
Course Credits: 03 (3-0-0)	Hours/Week: 03
Total Contact Hours: 44	Formative Assessment Marks: 20
Exam Marks: 80	Exam Duration: 03

Course Outcomes (COs):

On successful completion of this course, students will be able to:

1. Understand the basics of Data Structures.
2. Identify the appropriate data structures and algorithms for solving real world problems.
3. Understand the practical applications of Tree and Graph.

Unit-1	
Introduction: Data Structure Definition, Basic Terminology and Concepts, Importance of Data Structures In Programming. Classification of Data Structures. Primitive Data Structures, Non-Primitive Data Structures. **Arrays:** Declaration, Initialization, Accessing Elements, Multidimensional Arrays. C++ Strings, String Handling Functions, Applications of Arrays and Strings. **Stack:** Definition, Memory Representation, Algorithms for Stack Operations (Push, Pop), Applications of Stack.	11 Hours
Unit-2	
Queue: Definition, Memory Representation, Linear Queue, Circular Queue, Enqueue, Dequeue. Applications Of Queue. **Linked Lists**: Definition, Types. **Singly Linked List:** Implementation, Insertion [At the Beginning], Deletion [At the End]. **Doubly Linked List:** Memory Representation of Singly Linked List and Doubly Linked Lists. Applications of Linked List.	11 Hours
Unit-3	
Tree: Definition, Memory Representation Using Array and Linked List. **Binary Tree:** Definition, Traversal Algorithms [Pre-Order, In-Order, Post-Order], Construction of Tree from In-Order and Pre-Order, In-Order and Post-Order. Binary Search Trees: Insertion of a Node, Deletion of A Node. **Advanced Tree Structures AVL And B-Trees:** Definition and Applications.	11 Hours

Unit-4	
Graph: Definition, Memory Representation of Graph. Adjacency Matrix, Adjacency List. Graph Traversal Algorithms: Breadth-First Search (BFS), Depth-First Search (DFS). **Sorting Techniques:** Bubble Sort, Selection Sort [Algorithm, Time & Space Complexity]. **Searching Techniques:** Linear And Binary Search Sort [Algorithm, Time & Space Complexity]. **Heap:** Heap Operations and Applications.	11 Hours

Reference Books:

1. Data Structures Through C++ (4th Edition) Yashvant Kanetkar.

2. Data Structures and Algorithm Analysis in C++" by Mark Allen Weiss.

3. Data structure and Algorithms using C++ by Sachi Nandan Mohanty, Pabitra Kumar Tripathy.

4. Data Structures and Algorithms in C++, Second Edition by Adam Drozdek.

Course Code: CSM21P	Course Title: Data Structures using C++
Course Credits: 02 (0-0-2)	Hours/Week: 04
Total Contact Hours: 60	Formative Assessment Marks: 10
Exam Marks: 40	Exam Duration: 03

Course Outcomes (COs):
On successful completion of this course, students will be able to:
1. Implement data structures using C++.
2. Demonstrate searching and sorting techniques using ++.
3. Demonstrate simple programming skills through C++ programming language.

Laboratory Program List
Part A:
1. C++ program to find GCD of two numbers.
2. C++ program to implement Tower of Hanoi.
3. C++ program to print Fibonacci series.
4. C++ program to find largest and smallest element in an array.
5. C++ program to perform stack operations.
6. C++ program to perform Linear queue operations
7. C++ program to insert a node at the beginning of a singly linked list.
8. C++ program to delete a node at the end of a singly linked list.

Part B:
1. C++ program to construct a binary search tree
2. C++ program for Binary Tree traversal.
3. C++ program to implement DFS
4. C++ program to implement BFS
5. C++ program to sort an array (Selection Sort)
6. C++ program to sort an array (Bubble Sort)
7. C++ program to perform linear search of an element in an array.
8. C++ program to perform binary search of an element in an array.

Evaluation Scheme for Lab Examination [Marks: 40]

- **Writing:** One program from both Part A and Part B (15 Marks each) : 15 x 2 = 30
- **Execution:** Any one of the written Program: 05 Marks
- **Viva:** 05 Marks

CIE, SEE and QP Pattern for Theory Courses:
    Total Lecture hours per paper: 44
    No. of Units 4 (11 Hours Each)
    Internal Assessment C1 = 10 Marks, C2 = 10 Marks
    Semester End Theory Exam C3 = 80 Marks

Question paper pattern:
    Instructions: Answer Part-A and Part-B:
    Part-A
    Answer any 10 out of 12 Questions (3 Questions drawn from each unit). Each question carries 2 Marks. (10 X 2 =20)
    Q. No. 1 to Q. No. 12.
    Part-B
    Answer all the Questions. Each question carries 15 Marks. (4 X 15 =60)
    (Each question with internal choice and with maximum of 3 sub questions)