

SHIVAJI UNIVERSITY, KOLHAPUR.



**Accredited By NAAC
(2009)**

**Revised Syllabus For
B.Sc. Part - II
Computer Science
(Semester- III)
and
(Semester-IV)**

Syllabus to be implemented from June 2014 onwards.

Semester III

Subject	Name of the Paper	Marks
		Theory
Computer Science	Paper- V Fundamentals of Software Engineering	50
	Paper- VI Object Oriented Programming Using C++	50

Semester IV

Subject	Name of the Paper	Marks
		Theory
Computer Science	Paper- VII Relational Database Management System	50
	Paper- VIII Advanced Object Oriented Programming Using C++	50

B.Sc. Part – II Computer Science (Sem-III)

Paper – V : Fundamentals of Software Engineering

Unit – I : Introduction to System Analysis:

(5)

Definition of system, elements and characteristics of system, Types of system, Role and responsibilities of system analyst, Skill of system analyst.

Unit – II: Software Engineering:

(10)

Definition, characteristics of software, Qualities (correctness, reliability, user friendliness, robustness, efficiency, maintainability, reusability, portability, productivity, visibility), Software problem, System Development Life Cycle (SDLC): Classical model, water fall model.

Unit – III: System Analysis:

(10)

Requirement Analysis (Anticipation, Investigation, specification), Feasibility study (Economic, operational, technical), Fact finding technique (observations, record review, interviews, questionnaires, study of physical system), Analysis and Design tools (Data Flow Diagrams-guidelines, logical and physical), Decision Tables, . Decision Trees, Entity Relationship Diagrams- Concept of Entity, Attributes, Types Of relation.

Unit–IV: System Design, implementation and testing:

(15)

Input and Output Design and their types, Forms of Normalization (First, Second, Third), Database Design (File structure, File Organization, Important types of file, Database/ file operation), data dictionary, System Implementation: Hardware and software selection, manual implementation, online implementation, real-time implementation, construction of system (Traditional approach, Incremental approach), Software Testing: (White Box, Black Box, Alpha, Beta), Change Over, Quality Assurance.

Case studies : College Admission system, Inventory Management System, Library system, Bank management System etc..

References:

1. Software Engineering - R.S. Pressman
2. System Analysis & Design- AWAD E.H.
3. System Analysis and Design – V.K. Jain (Dreamtech Pub.)
4. System Analysis & Design- Parthsarthy/ Khalkar.
5. Basic System Analysis And Design-Alan Denial & Don Yeats.
6. System Analysis & Design -Edwards Perry.
7. An Integrated approach to Software Engineering – Narosa – Pankaj Jalote
8. Software Engineering - Martin L. Shooman

Paper – VI : Object Oriented Programming Using C++

Unit – I: Concept of OOP:

(10)

Difference between POP and OOP , Features of OOP, Application of OOP, General Structure of C++ program, Stream , Input, output stream , Handling Input and Output operations in C++, need of iostream.h file ,Managing outputs with manipulators.

Unit - II: Classes in C++:

(10)

How the class is different from 'C' Structure , Definition and syntax of class, various access specifiers- private , public and protected used in it, Member data and Member function of a class , Defining member functions inside the class, outside the class, Characteristics of member function, defining objects, array of objects, Handling static data member.

Unit – III: Constructors and Destructors:

(11)

Need of Constructor, Definition of constructor, syntax, rules and its use, Types of constructors, Need of Destructor Definition of destructors, syntax, rules and use, Friend function, Friend function to a class, passing object as parameters, common friend for two classes.

Unit – IV: Operators overloading:

(12)

Defining operator overloading, overloading function, rules for operator overloading, Overloading of arithmetic operators(+,-,/*), relational operators(<,>==), unary operators(++,-,-), Concept of function overloading, Overloading of constructors.

References:

- 1) OOP using C++ By E. Balagurusamy
- 2) Programming with C++ By D. Ravichandran
- 3) C++ Program By Yashavant Kanetkar
- 4) Let Us C++ By Yashavant Kanetkar.
- 5) Object Oriented Programming in C++ - By Thampi & Mantha - Dreamtech
- 6) Mastering C++ -By Venugopal.

B.Sc. Part – II Computer Science (Sem-IV)

Paper – VII : Relational Database Management System

Unit – I : Relational Data Model, Security and Integrity (10)

Definition of Data and information, database, Concept of DBMS and RDBMS , Introduction to Relational Model: Attributes and Domain, Database Schema and instances, concept of primary, super, candidate key, integrity constraints and its types (general, domain, entity). Security: Database security, database environment threats,

Unit – II : SQL and PL-SQL. (10)

DDL and DML statements, Select statement with where, orderby and group by clause, Constraints- primary key, foreign key, not null, unique, default, check, Sub queries and Nesting Sub queries, Join: Equi join, Outer join, Self join, Cross join Views, indexes, sequence, synonyms, Comparison between SQL & PL-SQL, Structure of PL-SQL block, IF-ELSE Construct, Loop Statement- Simple loop , For Loop, While Loop.

Unit – III: Cursor And Triggers. (8)

Cursor- Definition, types-Implicit, Explicit their attributes, steps to create explicit cursors, Triggers- Definition, Types -Row level and statement level.

Unit – IV: Introduction to MySQL (12)

Difference between sql and MySQL, Creating a Database and Tables, Inserting, Selecting, Ordering, Limiting, Grouping, Analyzing and Manipulating Data, Changing, Deleting, Searching, Database and Table Schema Statements, Data Manipulation Statements and Functions, Table Statements and Functions, Replication Statements and Functions, Aggregate Clauses, Aggregate Functions, String Functions, Date and Time Functions, Mathematical Functions, Flow Control Functions.

References :

1. Database System Concepts- Korth Silberschetz.
2. Commercial Application Development Using Developer 2000 - Ivan Bayross.
3. Structured Query Language - Osborne.
4. Structured Query Language - Martin Gruber.
5. MySQL The Complete Reference By Vikram Vaswani
6. Learning MySQL by O'reilly
7. MySQL in Nut Shell by Dyer 2nd Edition
8. SQL,PL/SQL Programming language of ORACLE- Ivan Bayross

Paper – VIII : Advanced Object Oriented Programming Using C++

Unit - V: Inheritance:

(10)

Definition, Concept of base and derived classes. defining derived classes, types of inheritance single, multilevel, multiple, mixed, etc. How to access private members in derived class, need of virtual base class, concept of abstract class.

Unit – VI: Polymorphism:

(10)

Definition, Types of Polymorphism - compile time, run time, Pointer to object concept of function polymorphism, virtual functions, rules for virtual function, pure virtual function.

Unit – VII: File handling :

(10)

Concept of file, File stream class- ifstream, ofstream, fstream, opening and closing a file, file opening modes, Reading and writing characters using – get() and put(), file pointers, use of seekg(), seekp(), tellg(), tellp() functions. Error handling functions, input, output operations – read(), write(), etc.

Unit – VIII : Introduction to UML:

(10)

An overview of UML, applications of UML in various domains, Different parts of UML, -Model elements, Different diagrams (Only type and its use). Extension mechanism, Views, relationships in the UML, Representation of classes and objects.

References:

- 1) OOP using C++ By E. Balagurusamy
- 2) Programming with C++ By D. Ravichandran
- 3) C++ Program By Yashavant Kanetkar
- 4) Let Us C++ By Yashavant Kanetkar.
- 5) Object Oriented Programming in C++ - By Thampi & Mantha - Dreamtech
- 6) Mastering C++ -By Venugopal.

Nature of Practical Question Paper:

Every candidate must produce a certificate from the Head of the Department in his college, stating that he has completed in a satisfactory manner a practical course on the lines laid down from time to time by the Academic Council on the recommendations of the Board of Studies and that the laboratory Journal has been properly maintained. Every candidate must have recorded his/her observations in the Laboratory journal and written a report on each exercise performed. Every journal is to be signed periodically by a member of the teaching staff and certified by the Head of the Department at the end of the year. Candidates are to produce their journals at the practical examination and such journals will be taken into account by the examiners in assigning marks.

The practical examination will be conducted at the end of year (i.e. end of Sem- IV). The practical paper will contain the questions from Sem- III and Sem- IV syllabus papers. The practical examination will be carried out of 50 marks. There will be four questions for each practical paper. The student has to solve any TWO questions. The practical question paper will be based on Paper-V, Paper-VI, Paper-VII and Paper-VIII.

In practical question paper there shall be **four** questions each of twenty marks, a student has to attempt any **two** questions. Five marks are reserved for the Certified Journal and 5 marks for the oral examination. Practical examination be of four hours duration which includes paper work, on line implementation and viva examination.

Sr. No.	Name of Practical Paper	Based on Theory paper	Duration per week per batch of 20 students	Marks
1	Practical Paper II	Paper-V & VII	4 Hrs.	50
2	Practical Paper III	Paper-VI & VIII	4 Hrs.	50

(Sample Questions for practical)

Practical Paper II:(Based on Theory paper V of sem-III)

1. Sample case studies on System Analysis and Design

- a. Payroll System
- b. Inventory Management System
- c. College Library System
- d. Bazaar Management System
- e. College Information System
- f. Store Management System

(The detail system study is to be expected.)

Practical Paper II:(Based on Theory paper VII of Sem- IV)

2. Create emp table and dept table with appropriate field and apply following integrity constraint on appropriate fields.

- i. Primary key.
- ii. Foreign key.
- iii. not null
- iv. default
- v. check

3. Create student table with appropriate field and do following things.

4. Insert 10 appropriate records.

- i. Update record
- ii. Delete records.
- iii. Alter table
- iv. Drop table.

5. Use any tables and do select operations using Operators, clauses and aggregate function.

6. Create table and use sub query and join operations.

7. Illustrative Example using PL/ SQL. Controls.

8. Illustrative Example on Trigger and cursor.

9. Illustrative examples on MySQL.

Practical Paper III: :

(Based on Theory paper VI of Sem – III and VIII of Sem-IV)

1. Simple programs to find divisors , factorial ,count even digits in it of any supplied number.

2. Write different OOP to

Read a set of numbers and sort it in ascending or descending order.

Read stock of items and find out which items which are out of stock

Read List of students and count number of male and female students.

3. Write an OOP to

Demonstrate use of constructor and destructor

Friend functions

Overloading of operators using member and friend function.

4. Write a program in C++ to generate the following pyramid of nos. using polymorphism.

2

2 4

2 4 6

2 4 6 8

2 4 6 8 10

5. Write an OOP to demonstrate use of virtual and pure virtual functions for late binding.

6. Write a program in C++ that creates a text file. After creation read the same file and display only vowels on the screen.

7. Write a complete program to create a disk file to store student information.

.

Nature of Question Paper for Sem-III and IV

Common Nature of Question Paper as per Science Faculty.

Equivalence to the Old Syllabus:

Sr. No	Paper No Title of the old Paper	Paper No. Title of the New Paper
1	Sem-III- Paper-V- Fundamentals of Software Engineering Paper-VI Introduction to Object Oriented Programming using C++	Sem-III- Paper-V- Fundamentals of Software Engineering Paper-VI Object Oriented Programming using C++
2	Sem-IV Paper-VII Relational Management Systems Paper-VIII Advanced Object Oriented Programming using C++	Sem-IV Paper-VII Relational Database Management System Paper-VIII Advanced Object Oriented Programming using C++