BCA23-CC201
Object Oriented Programming using C++

Max.Marks:100
Min.PassMarks:40

Internal Assessment Marks : 30[Theory(20)+Practical(10)]
External End TermExamMarks:70[Theory(50)+Practical(20)]

Time: Theory(3Hours),Practical(3Hours)

Credit:4

Course Objectives:

1. Learn the basics of C++program, data types and input/output statements.
2. Understand different types of operators, their hierarchies and also control statements of C++.
3. Implement programs using arrays and strings.
4. Get familiar with OOPS concepts in C++ language.
5. To implement the programs based on various concepts of C++.

Examiner Note: Examiner will set a total of NINE questions. Out of which FIRST question will be compulsory and the remaining EIGHT questions will be set from four units selecting two questions from each unit. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt FIVE questions in all, selecting one question from each unit. Examination will be of three-hour duration.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hour duration.

UNIT-I

Basic concept of OOP, Comparison of Procedural Programming and OOP, Benefits of OOP C++ compilation, Difference between C and C++. Elements of C++ Language - Tokens and identifiers: Character set and symbols, Keywords, C++ identifiers; Datatypes in C++, Operators ,Types of operators in C++, Precedence and associativity of operators,
function: prototype, function call, definition, passing arguments, inline function, function overloading.

UNIT-II

Object-oriented features of C++: Class and Objects, Data hiding & encapsulation, abstraction, Data Members and Member Functions, accessing class members, empty class, local class, global class, Scope Resolution Operator and its Uses. Static Data Members. Static Member Functions. Structure vs Class. Friend function and friend class.
Constructors and Destructors: Constructors, Instantiation of objects, Default constructor, Parameterized constructor, Copy constructor, Destructors

UNIT-III

Operator Overloading: Overloading unary and binary operators: arithmetic operators, manipulation of strings using operators.
Inheritance: Derived class, base class, Accessing the base class member, Inheritance: multilevel, multiple, hierarchical, hybrid

UNIT-IV

Virtual base class. Abstract class. Virtual Functions. pure virtual functions: Polymorphism & its types. Exception Handling in C++: exception handling model, exception handling constructs - try, throw, catch, Order of catch blocks, Catching all exceptions.

UNIT-V(PRACTICUM)

Practicum:
In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution based on C++ Language during the laboratory work.

Internal Assessment:	Theory	Practicum	End Term Examination:
Class Participation	5	5	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	5	-	
Seminar/Demonstration/Viva-voce/ Lab records etc.:	-	5	
Mid-Term Exam	10	-	
Total	20	10	

Suggested Readings:

- Herbert Scildt, C++, The Complete Reference, Tata McGraw-Hill
- Robert Lafore, Object Oriented Programming in C++, SAMS Publishing
- BjarneStroustrup, The C++ Programming Language, Pearson Education
- Balaguruswami, E., Object Oriented Programming In C++, Tata McGraw-Hill.
- Richard Johnson, An Introduction to Object-Oriented Application Development, Thomson Learning

BCA23-M201
Advanced Discrete Structures

Max.Marks:50
Min.PassMarks:20

Internal Assessment Marks :15[Theory(10)+Practical(05)]
External End Term Exam Marks: 35[Theory(20) +Practical(15)]

Time: Theory(3Hours),Practical(3Hours)

Credit:2

Course Objectives:

1. Understand the basic concepts of Theory of Programming Languages.
2. Understand concept of Lattices, Boolean Algebra.
3. Understand the basic concepts of Fuzzy Logic
4. Learn about applications of Boolean Algebra and Lattices..
5. Learn to work with Fuzzy Logic.
6. To implement the programs based on Lattice, Boolean Algebra and Fuzzy Logic.

Examiner Note: Examiner will set a total of NINE questions. Out of which FIRST question will be compulsory and the remaining EIGHT questions will be set from four units selecting two questions from each unit. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus .Candidate will have to attempt FIVE questions in all, selecting one question from each unit. Examination will be of three-hour duration.

Practicum will be evaluated by an external and an internal examiner. Examination will be of three-hours duration.

UNIT-I

Logic and Propositional Calculus : Introduction, Propositions and Compound Statements , Basic Logical Operations ,Propositions and Truth Tables , Tautologies and Contradictions , Logical Equivalence ,Algebra of Propositions , Conditional and Biconditional Statements

UNIT-II

Set theory: Introduction , Sets and Elements, Subsets , Venn Diagrams , Set Operations ,Algebra of Sets, Duality , Finite Sets, Counting Principle ,Classes of Sets, Power Sets, Partitions: Introduction, sets and elements, universal set and empty set, subsets, venn diagrams, set operations.

UNIT-III

Boolean Algebra: Introduction , Basic Definitions , Duality ,Basic Theorems , Boolean Algebras as Lattices , Representation Theorem, Sum-of-Products Form for Sets , Sum-of-Products Form for Boolean Algebras

UNIT-IV

Relations: Introduction, Types of relations, equivalence relations, Partial order relations, ordered sets, Hasse diagram of partial ordered sets, minimal and maximal, first and last elements.

UNIT-V (PRACTICUM)

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies execution based on Lattices, Boolean Algebra and Fuzzy Logic and Arithmetic during the laboratory work.

Suggested Evaluation Methods:

Internal Assessment:	Theory	Practicum	End Term Examination:
Class Participation	4	-	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	-	-	
Seminar/Demonstration/Viva-voce/Lab records etc.:	-	5	
Mid-Term Exam	6	-	
Total	10	5	

Suggested Reading

- Doris Appleby, Programming Languages: Paradigm and Practice, Mc-Graw Hill, 1991.
- Allen Doerr : Applied Discrete Structures, Open Textbook Library, 2021
- Rosen H : Discrete Mathematics and Its Applications, Mc-Graw Hill, 2017
- M. Ganesh , "Introduction to Fuzzy sets and Fuzzy Logic", PHI , 2006

B23-SEC-201 Cloud Computing Skills

Max. Marks: 75
Min. Pass Marks: 30

Internal Assessment Marks : 20 [Theory (15) + Practical (05)]
External End Term Exam Marks : 55 [Theory (35) + Practical (20)]

Time : Theory (3 Hours), Practical (3 Hours)

Credit: 3

Course Objectives:

1. *To understand the concept of Clouding Computing.*
2. *To know about Seven Step Model of Migration into a Cloud.*
3. *To get familiar with Cloud Paradigms.*
4. *To know about Virtual Machine infrastructure and Security in Cloud.*
5. *To understand the Integration of Private and Public Cloud*

Examiner Note: Examiner will set a total of NINE questions. Out of which FIRST question will be compulsory and the remaining EIGHT questions will be set from four units selecting two questions from each unit. All questions will carry equal marks. First question will comprise of short answer type questions covering entire syllabus. Candidate will have to attempt FIVE questions in all, selecting one question from each unit. Examination will be of three-hour duration.

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UNIT-I

Basic Concepts of Cloud Computing Computer Network Basics. Concepts of Distributed Systems. Concepts of Cloud Computing and its Necessity. Cloud Service Providers in use and their Significance.

UNIT-II

Cloud Infrastructure Cloud Pros and Cons. Cloud Delivery Models.Cloud Deployment Models.

UNIT-III

Cloud Storage Management Concept of Virtualization and Load Balancing. Overview on Virtualization used for Enterprise Solutions. Key Challenges in managing Information. Identifying the problems of scale and management in big data.

UNIT-IV

Building Cloud Networks Designing and Implementing a Data Center-Based Cloud Installing Open Source Cloud service. Amazon Web Services (AWS). Google Cloud Platform.

UNIT-V (PRACTICUM)

In practical component the teacher concerned / instructor will ensure minimum 15 programs / case studies during the laboratory work.

Suggested Evaluation Methods:

Internal Assessment:	Theory	Practicum	End Term Examination:
Class Participation	4	2	A three hour exam for both Theory and Practicum
Seminar/presentation/assignment/quiz/class test etc	4	-	
Seminar/Demonstration/Viva-voce/Lab records etc.:	-	3	

Mid-Term Exam	7	-	
Total	15	5	

Suggested Readings:

1. RajkumarBuyya, Christian Vecchiola and S. ThamaraiSelvi, "*Mastering Cloud Computing*", McGraw Hill Education, 2016.
2. Lizhe Wang, Rajiv Ranjan, Jinjun Chen and BaualemBenatallah, "*CludComputing : Methodology Systems and Applications*", CRC Press, 2012.
3. Kris Jamsa, "*Cloud Computing*", Jones and Bartlett Learning, 2013.
4. NayanRuparelia, "*Cloud Computing*", MIT Press, 2015

B23-CC-C4
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Mid-Term Exam	10	-	
Total	20	10	

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