TRIPURA UNIVERSITY

(A Central University)
Suryamaninagar-799022

Syllabus

OF

Computer Science

Semester – V

2014

3rd edition.

SEMESTER –V

Paper: H5

Subject: Operating System and Object Oriented Language (Theory)

Marks: 100 (80 + Internal -20)

UNIT – I

Introductory Concepts: Operating system functions and characteristics, historical evolution of operating systems, Real time systems, Distributed systems, Methodologies for implementation of O/S service system calls, system programs, OS Commands, shell, shell scripts.
Process management: Process concepts, Process states and Process Control Block (PCB).
CPU Scheduling: Scheduling criteria, Levels of Scheduling, Scheduling algorithms, Multipleprocessor scheduling.
Deadlocks: Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery, practical considerations.
Case Study: Linux and Windows

UNIT – II

Concurrent Processes: Critical section problem, Semaphores, Mutual exclusion, Classical process co-ordination problems and their solutions, Inter-process Communications.
Storage Management: memory management of single-user and multiuser operating system, memory allocation, fixed and dynamic allocation, partitioning, swapping, paging and segmentation, virtual memory, Page replacement Algorithms, Thrashing.
Case Study: Linux and Windows

Device and file management: Disk scheduling, Disk structure, Disk management, File Systems: Functions of file system, File access and allocation methods, Directory Systems: Structured Organizations, directory and file protection mechanisms.
Case Study: Linux and Windows

UNIT – III

Principles of OOP, procedure oriented programming vs. object oriented programming, basic concepts, advantages, application of OOPs, object oriented modeling & design, object oriented languages.

Beginning with C++: structure of C++ program, creating, compiling, linking & executing a C++ program, Tokens, keywords, identifiers, expressions & control structures, basic data types, user-defined data types, derived data types, symbolic constants, type compatibility, variable declaration, dynamic initialization of variables, reference variables, operators in C++.

Scope resolution operator, memory management operators, manipulators, type cast operators, operator precedence, control structures. Main function, function prototyping, call by reference, call by value, inline functions, default arguments, constant arguments, function overloading.

UNIT – IV

Specifying a class, defining member functions, making an outside function inline, private member function; protected member function, array within a class, memory allocation for objects , static data members, static member functions, array of objects, objects as function arguments, returning objects, Introduction to constructors and destructors, operator overloading & type conversions.

Friend functions, Inheritance and its various typesalong with programs, introduction to pointers, pointers to object, pointers to derived classes, virtual functions and polymorphism, operator overloading,this pointer.

Managing console I/O operations: introduction, C++ streams, C++ stream classes, unformatted I/O operations, formatted console I/O operations, managing O/P with manipulators. Working with Sequential Date Files, template.

TEXT BOOKS:

1. Silberschatz A., Galvin P.B.,and Gagne G., Operating System Concepts, John Wiley & Sons, Inc.,New York.
2. Godbole, A.S., Operating Systems, Tata McGraw-Hill Publishing Company, New Delhi.
3. Object oriented programming with C++ by E. Balaguruswamy.

REFERENCE BOOKS:

1. Deitel, H.M., Operating Systems, Addison- Wesley Publishing Company, New York.

2. Tanenbaum, A.S., Operating System- Design and Implementation, Prentice Hall of India, New Delhi.
3. Programming in C++ by Robert Lafore
4. C++ - The complete reference by Herbert Schildt (TMH)
5. Programming with C++ - Schaum Series
6. Michael R. Blaha, J R Rambaugh, Object Oriented Modeling and Design with UML, Pearson

SEMESTER –V

Paper: H6

Subject: Object Oriented Programming Laboratory (Practical)

Marks: 100 (80 + Internal -20)

Unit – I

Evolution of Programming paradigms, Object based and Object oriented themes, Basic Concepts of Object-Oriented Programming, Advantages and Application of OOPS.

Introduction to C++: Streams in C++, Basic Data Types, User-Defined Data Types, Derived Data Types, Keywords, Identifiers, C++ structures, Type Cast Operator.

Control Structures:if-else statements, jump statement, break statement, continue statement, switch statement and nested switch case statement, for Loop, nested for Loops, while loop, do-while loop.

Functions in C ++ :call by value and call by reference, inline function vs macro, function overloading, friend and virtual Functions.

Classes and Objects : C ++ Program with Class, specifying a Class, defining members of a class, nesting of member functions. The role of public, private and protected keywords.static data members, static member functions, creating objects, arrays of objects, objects as function arguments, returning objects, friendly functions, constant member functions. pointers to members.

Unit – II

Constructors and Destructors : Multiple Constructors in a Class, Parameterized Constructors, Constructor overloading, Copy Constructor, Dynamic Constructor, Destructors.

Operator Overloading and Type Conversions: Defining Operator Overloading, Overloading Unary Operators, Overloading Binary Operators, Overloading Binary Operators Using Friends, Type Conversions.

Inheritance: Extending Classes, Benefit of Inheritance. Overloading and Overriding. Different types of Inheritance: Single Inheritance, Multilevel Inheritance, Multiple Inheritance, Hierarchical Inheritance, Hybrid Inheritance, Virtual Base Classes, Abstract Classes. Visibility modifiers in Inheritance.

Pointer, Virtual Functions and Polymorphism: Pointers to Objects, this Pointer, Pointers to Derived Classes, Virtual Functions.

Unit – III

Java Fundamentals: Fundamentals of Object Oriented programming: Object Oriented paradigm, Basic concepts of Object Oriented Programming, Benefits of OOP, Applications of OOP.

Java Evolution: Java Features, How Java differs from C and C++, Java and Internet, Java and World Wide Web, Web Browsers, Hardware and Software Requirements, Java Environment.

Overview of Java Language: Simple Java Program, Java Program Structure, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments.

Constants, Variables and Data types: Constants – Variables – Data types – Declaration of Variables-Giving Values to variables- Scope of Variables-Symbolic Constants-Type Casting.

Unit – IV

Oops Concepts in Java Operators and Expressions: Arithmetic Operators – Relational Operators-Logical Operators – Assignment Operators – Increment and Decrement Operators – Conditional Operators – Bitwise Operators – Special Operators – Arithmetic Expressions – Evaluation of Expressions – Precedence of Arithmetic Operators – Operator Precedence and Associativity.

Decision Making and Branching: Decision Making with If statement – Simple If Statement-If else Statement-Nesting If Else Statement- The switch Statement.

Decision Making and Looping: The while statement – The do statement – The for statement – Jumps in Loops. Class, Objects and Methods: Defining a Class – Fields Declaration – Methods Declaration – Creating Objects – Accessing class members – Constructors– Methods Overloading – Static Members – Nesting of Methods – Inheritance – Overriding Methods – Final Variables and Methods – Final Classes – Abstract Methods and Classes – Visibility Control.

Prescribed books :

1. E.Balaguruswamy, Programming with Java, A primer, 3e, TATA McGraw-Hill Company (2008).
2. Robert Lafore, Data Structures & Algorithms in Java, Second Edition, Pearson Education(2008)
3. E.Balagurusamy, Object Oriented Programming with C++, McGrawHill Educaion.

Reference Books :

1. John R. Hubbard, Programming with Java, Second Edition, Schaum's outline Series, Tata McGrawhill (2007).
2. Timothy Budd, Understanding Object Oriented Programming with Java, Pearson Education (2007).
3. Adam Drozdek, Data Structures and Algorithms in Java, Second Edition, CengageLearning(2008).
4. John R. Hubbard, Anita Hurry, Data Structures with Java, Pearson Education (2008).
5. Cay S. Horstmann, Core Java, Volume I : Fundamentals, Pearson India
6. Hubbard, Programming with C++, Second Edition, Schaum's outline Series, Tata McGrawhill.