Object Oriented Programming (CSC-202)
Tribhuvan University
Soch College of Information Technology
Bachelor of Science in Computer Science and Information Technology

Course Title: Object Oriented Programming
Course no: CSC-202 ---------- Full Marks: 60+20+20
Credit hours: 3 ---------- Pass Marks: 24+8+8
Nature of course: Theory (3 Hrs.) + Lab (3 Hrs.)
Course Synopsis: Study of basic programming skills, the concept of object oriented and its features, implementing the features.
Goal: To provide the object oriented programming approach to solve the problem.

Course Contents:

Unit 1: ---------- 11 Hrs.
1.1 Introduction to Programming Concept: Overview of structural programming approach, Object oriented approach, Features of object oriented languages, Components of object oriented languages like object, class.
1.2 Elements of Object Oriented Languages: Introduction to inheritance, polymorphism, abstraction.
1.3 C++ basics: Introduction, Basic Program Construction like functions and program statements. Output using cout, Directives: Preprocessor Directives, Header Files, The using directives. Comments: Comment Syntax. Integer Variables: Definition, declaration, variables names, assignment statements, integers constants, output variable. Input with cin, Operators, library functions.
Unit 2: ---------- 15 Hrs.
2.1 Control Structures: Introduction, control statements, The if selection structure, The if/else selection structure, The while structure, The For structure, The switch structure, The do/while structure, The break and continue statement.
2.2 The Functions: Introduction, Math library functions, Definition/Prototypes, Header files, Storage classes, Scope rules, Recursion, Inline functions, Function Overloading, Function Templates.
2.3 Arrays: Introduction, Declaring arrays, Passing arrays to functions, Types of arrays.
2.4 Pointers: Introduction, Pointer variables declaration & initialization, Operators in pointers, Calling functions by reference, Relationship between pointers & arrays, arrays of pointers, Function pointers.
Unit 3: ---------- 19 Hrs.
3.1 Classes & Objects: Introduction, Features of class, Object and its features, Declaration of class, Using the class, Accessing members of class, Class scope, Initialization class objects: Constructor, Destructor. Object as function arguments: Overload constructor, Member functions defined outside the class, Objects as arguments.

3.2 Operator Overloading: Introduction, Fundamental of operator overloading, Restriction on operator overloading, Operator functions as a class members, Overloading stream-insertion and stream-extraction operators, Overloading unary and binary operators.
3.3 Inheritance: Introduction, Types of inheritance, Protected members, Casting base class pointers to derived – class pointers, Public, protected, and private inheritance. Constructor and Destructor in derived classes.
3.4 Virtual Functions & Polymorphisms: Introduction, Type fields & switch statements, Virtual functions, Abstract base classes & Concrete classes, Polymorphism and its roles.
3.5 Templates: Introduction, Function templates, overloading templates functions, class templates, templates & inheritance.
3.6 Exceptional Handling: Introduction, Use of exceptional handling, Try, throw and catch.

Laboratory works:
1. Write a C++ code to solve the quadratic equations.
2. Write a C++ code to find out the prime number between 2000 and 2050.
3. Write a C++ code to sort the given 10 numbers in ascending order.
4. Write a C++ code to create a class that calculates the interest of any number.
5. Write a C++ code to get the transpose of given matrix.
6. Write a C++ code that uses the polymorphism.
7. Write a C++ code that uses the inheritance.
8. Write a C++ code that uses exceptional handling facility.
9. Write a C++ code to reverse the given text.
10. Write a C++ code to get the list of leap year from 1900 to 2000.

Text Books: C++ How to Program; Deitel & Deitel, 3rd Edition, PEARSON

Reference: Object Oriented Programming in C++; Robert Lafore, Third Edition, GALGOTIA