Tribhuvan University
Institute of Science and Technology
BSc. CSIT Third Semester
Course Title: Object Oriented Programming
Micro-syllabus

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 the basic programming skills, the concept of object oriented programming and its features, implementing the features.
Goal: To provide the object oriented programming approach to solve the problem.
Course Contents:
Unit 1:

1.1 Introduction to programming concept
- Overview of structural programming approach
- Object oriented approach
- Features of object oriented languages
- Components of object oriented languages

1.2 Elements of object oriented languages
- Introduction to inheritance
- Introduction to polymorphism
- Encapsulation and abstraction

1.3 C++ basics
- Introduction to C++
- Basic Program construction: like functions, statements etc.
- Output using *cout*
- Directives:
  - Preprocessor directives
  - Header files
  - The using directives etc
- Comments and syntax
- Integer variable
  - Definition
  - Declaration
  - Variable names
  - Assignment statements
- Integer constants
- Output variable
- Input with *cin*
- Operators
- Library functions etc.

Unit 2:

2.1 Control structure
- Introduction
- Control statements
- The *if* selection structure

The *if/else* selection structure
The *while* structure
The *for* structure
The *do/while* structure
The *switch* structure
The *break* and *continue* structure, etc.

2.2 The Functions
Introduction
Math library functions
Function definition, prototype
Header files
Storage classes
Scope rules
Recursion
Inline function
Function overloading
Function templates etc.

2.3 Arrays
Introduction
Declaring arrays
Passing arrays to functions
Types of array, etc

2.4 Pointers
Introduction
Pointer variable declaration and initialization
Operators in pointers
Calling functions by references
Relationship between array and pointers
Arrays of pointers
Function pointers, etc.

Unit 3:

3.1 Class and Objects
Introduction
Features of class
Object and its features
Declaration of class
Using class
Accessing member of class
Class scope
Initialization class objects
Constructor
Destructor
Object as function arguments
Overloaded constructor
Member functions defined outside class
Objects as arguments, etc

3.2 Operator overloading
Introduction

Fundamentals of operator overloading
Restriction on operator overloading
Operator functions as class members
Overloading stream insertion and stream extraction operators
Overloading unary and binary operations, etc

3.3 Inheritance
Introduction
Types of inheritance
Protected members
Casting base class pointers to derived class pointer
Public, protected and private inheritance
Constructor and destructor in derived classes, etc.

3.4 Virtual functions and polymorphisms
Introduction
Type fields and switch statements
Virtual functions
Abstract base classes and concrete classes
Polymorphism and its roles, etc

3.5 Templates
Introduction
Function templates
Overloading templates functions
Class templates
Templates and inheritance, etc

3.6 Exceptional handling
Introduction
Use of exceptional handling
Try, through and catch statements

Laboratory Works:
Suitable examples from each subsection are considered as the laboratory work.
Text book: C++ how to program: Deitel & Deitel, 3rd Edition, Pearson
Reference: Object Oriented Programming in C++: Robert Lafore, Third Edition, Galgotia
Homework
Assignment: Assignment should be given from the above units in throughout the semester.
Computer Usage: No specific
Prerequisite: C
Category Content: Science aspect: 40%
Design aspect: 60%