



# Marwadi University

## Bachelor of Computer Application

### Semester III

Subject Code : 05BC0304

Subject Name: Object Oriented Concepts & Programming using C++ (OOCPP)

#### Learning Objectives:

Understanding the object oriented concepts and doing efficient programming using C++ for computers as well as different hand held devices like mobile phones, networking devices like routers, etc. is the recent need from IT and IT enabled industry. The course enables the student to master such skills of object oriented programming using C++ and satisfy the requirements of industry. Aim of the course is to enable students to

1. Clear understanding of difference between procedural and object oriented programming.
2. Understand and learn C++ as a programming language, its various features.
3. Learn Object Oriented Concepts, application development using C++ and usage in real life world

#### Prerequisites:

1. Knowledge of programming in C language
2. Programming concepts including algorithms, flow chart, and logic building

#### Course Content:

Unit	Course Content	Hours
1	<b>Object oriented programming paradigm</b> Object oriented paradigm, structured versus Object-Oriented Development, Elements of Object oriented programming, objects, classes, multiple views of the same object, encapsulation and data abstraction, inheritance, delegation, polymorphism, message communication, merits and demerits of OO methodology. <b>Migrating from C Language to C++ Language</b> Introduction, stream based I/O, comments, literals, scope resolution operator, variable definition, reference variables, strict type checking, parameter passing by reference, inline functions, function overloading, default arguments, keyword typedef, functions as a part of struct, type conversion, function templates, runtime memory management	4
2	<b>C++ Programming Basics</b> Getting Started, Basic Program Construction, Output Using cout, Directives, Comments, Integer Variables, Character Variables, Input with cin, Floating Point Types, Type bool, The setw Manipulator, Variable Type Summary, Type Conversion, Arithmetic Operators, Library Functions <b>Loops and Decisions, Structures, Enumerations</b> Relational Operators, Loops, Decisions, Logical Operators, , Precedence Summary, Other Control Statements, Structures, Enumerations <b>Functions</b> Simple Functions, Passing Arguments to Functions, Returning Values from Functions, Reference Arguments, Overloaded Functions, Recursion, Inline Functions, Default Arguments, Scope and Storage Class, Returning by Reference	10
3	<b>Objects and Classes</b> A Simple Class, C++ Objects as Physical Objects, C++ Objects as Data Types, Constructors, Objects as Function Arguments, The Default Copy Constructor, Returning Objects from Functions, Structures and Classes, Classes, Objects, and Memory, Static Class Data, const and Classes	12



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	<b>Arrays and Strings</b> Array Fundamentals, Arrays as Class Member Data, Arrays of Objects, C-Strings, The Standard C++ string Class <b>Operator Overloading</b> Overloading Unary Operators, Overloading Binary Operators, Data Conversion, Pitfalls of Operator Overloading and Conversion, Keywords explicit and mutable	
4	<b>Inheritance</b> Derived Class and Base Class, Derived Class Constructors, Overriding Member Functions, Which Function Is Used?, Class hierarchies, public and private inheritance, levels of inheritance, multiple inheritance, ambiguity in multiple inheritance, aggregation <b>Pointers</b> Addresses and pointers, the address-of operator &, pointers and arrays, pointers and functions, pointers and C-Type strings, memory management: new and delete, pointers to objects <b>Virtual Functions</b> Virtual functions, friend functions, static functions, assignment and copy initialization, this pointer, dynamic type information	15
5	<b>Streams and Files</b> Stream classes, stream errors, Disk file I/O with streams, file pointers, error handling in file I/O, File I/O with member functions, overloading the extraction and insertion operators, memory as stream object, command-line arguments, printer output <b>Exception Handling</b> Exceptions, components of exception, handling multiple exceptions	7

#### Text Book(s):

1. "Object Oriented Programming in C++"; Robert Lafore; 4<sup>th</sup> Edition; Pearson Education
2. "Mastering C++"; K R Venugopal, Rajkumar, T Ravishankar; Tata McGRAW HILL

#### Reference Book(s):

1. "Object Oriented programming with C++"; E. Balagurusamy; TMH
2. "Complete Reference C++"; Herbert Schildt; McGraw Hill Publications
3. "Computer Science- A Structured approach using C++"; Forouzan ,Gilburg; THOMSON Books
4. "The C++ Programming Language"; Bjarne Stroustrup; Pearson Education
5. "Effective C++"; Scott Mayer; Addison Wesley

#### Chapter wise coverage from the Text Books:

1. From Text Book # 1 : Chapter 2,3,4,5,6,7,8,9,10,11,12,14
2. From Text Book # 2 : Chapter 1,2

#### Accomplishment of the student after completing the course :

Students should be able to

- Understand and learn the Object Oriented approach of programming
- Aware about working and architectural model of C++
- Solve real life problems using C++ with keeping balance between efficiency and flexibility