

## Course No: MCA-2T3

### Course Title: Advanced Programming Concepts Using C / C++

#### Unit I

Arrays: Declaration; initialization; 2-dimensional and 3-dimensional array, passing array to function, strings and string functions, and character arrays.

Pointers: variables, swapping data, swapping address v/s data, misuse of address operators, pointers and arrays , pointers to pointers , strings , pointer arithmetic, additional operators , portability, pointers to functions, using pointers with arrays , void pointers .

Structures and unions : syntax and use, members, structures as function arguments, structure pointers , array of structures as arguments , passing array of structure members, call by reference.

#### Unit II:

Functions ; prototype , passing parameters , storage classes , identifier visibility, Recursive functions. Command-line arguments. Scope rules, Multi-file programming, Introduction to macros.

File processing in C and C++.

Introduction to graphics, graphic initialization, graphic modes, drivers, basic drawing functions, Animations- concept and implementation, Building graphical user interface.

#### Unit III

Introduction to classes and objects; Constructor; destructor; Operator overloading; Function overloading; function overriding; friend function; copy constructor;

Inheritance: Single, Multiple, and Multilevel Inheritance;

Virtual function and Polymorphism: Dynamic binding, Static binding; Virtual functions; Pure virtual function; concrete implementation of virtual functions; Dynamic binding call mechanism; Implementation of polymorphism; virtual destructors.

#### Unit IV

Templates: Function Templates, Class Templates, Member Function Template and Template Arguments, Exception Handling, Standard Template Library: Containers, Algorithms, Iterators and Function Objects.

#### Reference Books:1.

1. FOSTER AND FOSTER "C by discovery" RRI penram.
2. YASHWANT KANETKAR " Let us C " PHI.
3. E. BALAGURUSWAMI "Programming in ANSI C" Tata McGraw Hill.
4. BJARNE STROUSTRUP " The C++ programming language" Pearson Education.
5. HERBERT SCHILD " C++ The complete Reference" Tata McGraw Hill.
6. ROBERT LAFORE "Object orientation with C++ Programming" Waite Group.