Syllabus for

6 Month Adv Diploma in Software Programming

GRADIENT INFOTECH

Course Duration for 6 Month Adv Diploma In Software Programming Course

- **24 weeks or 6 Month**

Objective For 6 Month Adv Diploma In Software Programming Course

- **To become a Professional Software Programmer**

Eligibility for 6 Month Adv Diploma in Software Programming Course

- **Any Technical Graduates**
  (BSc, BCS, BCA, BE, B Tech, MSc, MCS, MCA, M Tech)
- **Undergraduates may also apply**

Course overview For 6 Month Adv Diploma in Software Programming

Programming in 'C'

Introduction Of Programming Languages

- Types of Languages
- Evaluation of 'C' language
- Structure of a 'C' program
- 'C' program development life cycle.
- Executing and Debugging a 'C' program

'C' Tokens

- Keywords and identifiers
- Operators
- Constants
- Variables
- Data types
- Precedence of Operators
- Scope and Lifetime of variables

Control Statement and Expressions

- Decision making using if statement
- Types of if….else block
- Switch case block
- Arithmetic Expressions
- Evaluation of Expressions
- Goto statement

Looping

- Concept of Loop
- For Loop
- While loop
- Do while loop
- Jumping in loop
- Break and continue statement

Algorithms and Flowchart

- Algorithms and Flowcharts(definitions, symbols)
- Characteristic of an algorithm

Syllabus for

6 Month Adv Diploma in Software Programming

GRADIENT INFOTECH

Arrays and String

- Introduction of Array
- One-D Array
- Two-D Array
- Multidimensional Array.
- Dynamic Arrays
- Implementing string variabls
- String handling functions

Functions

- Concept of Function
- User Defined Function
- System Defined Function
- Types of parameter passing in Function

Pointers

- Need of Pointers
- Types of Pointers
- Pointer Expression
- Arrays of Pointers
- Pointers and Functions

Structure and Unions

- Need of structure
- Implementing structure variable
- Arrays of structure
- Structure within Structure
- Introduction of Unions
- Difference between Structure and Union

File Handling using 'C'

- Opening and closing File
- Input/output operations on file
- Random Access to Files
- Command Line Arguements

Dynamic Memory Allocation

- Concept of Dynamic Allocation
- Implementing Malloc and Calloc Functions
- Releasing the free space

Storage Classes and Preprocessors

- Introduction of Storage Class
- Types of Storage Classes
- Introduction of Preprocessor
- Macro Substitution
- File Inclusion

Introduction Of Data Stucture

- Concept of Data Structure
- Types of Data Structure
- Implementing Stack
- Implementing Linked List

Graphics using 'C'

- VDU Basics
- Simple Library Functions

Programming in C++

Introduction to Object Oriented Programming

- Concept of OOP
- Features of OOP
- Introduction of 'C++'
- Structure of 'C++' Program
- Executing and Debugging a 'C++' Program

'C++' Tokens and Type Casting

- Keywords and Identifiers
- Operators
- Constants
- Variables
- Data Types
- Precedence of Operators
- Scope and Lifetime of Variables

Syllabus for

6 Month Adv Diploma in Software Programming

GRADIENT INFOTECH

Classes and Objects

- Classes & Object Specifier
- Defining data members and member function
- Array of objects
- Managing console I/O
- ‘C++’ stream classes
- Formatted and unformatted console I/O
- Usage of manipulators

Function in ‘C++’

- Call by reference, Return by reference
- Function overloading and default arguments.
- Inline function
- Static class members
- Friend functions
- Virtual functions

Constructor and Destructor

- Concept of Constructor
- Types of Constructors
- Memory allocation (new and delete)
- Usage of destructor

Operator Overloading

- Overloading Unary and Binary operators
- Overloading using friend function

Inheritance

- Types of inheritance
- Virtual base classes and abstract base classes
- Constructor and destructor in derived class

Working with files

- File operations
- File pointer and their manipulation
- File updation with random access

Exception Handling

- Various Exception Handling classes
- Implementing try and catch block
- Use of throw keyboard

Templates

- Introduction to Templates
- Class templates, function templates and overloading of function templates
- Standard Template Library (STL)
- Run Time Type Identification(RTTI)

SOL-PLSOL

Introduction to SQL Constructs

- Introduction
- Basic Structure
- DDL Commands
- DML Commands
- Simple Queries
- Nested Queries
- Aggregate Functions
- Clauses
- Triggers and Views

Joining Oracle Tables

- Equi Join
- Outer Join
- Hiding join by creating views

SQL access methods

- Merge join
- Hash join
- Nested Loop join

Advanced SQL Operators

- Using IN, NOT IN, EXISTS and NOT EXISTS
- Between Operator
- EXISTS clause
- Using wildcards in queries (LIKE operator)
- Subqueries
- Correlated subqueries
- Non-correlated subqueries

SQL Tuning

- Introduction to rule based optimization
- Introduction to cost based optimization
- Collecting table and index statistics
- Using column histograms
- Changing the default optimizer modes
- Using TKPROF
- Using SQL Trace
- SQL reusability within the library cache
- Table high water mark
- Table striping and table partitions

Basics of PL/SQL

- Introduction, overview and benefits of PL/SQL
- PL/SQL architecture
- PL/SQL wrapper utility

PL/SQL Structures

- Simple blocks
- Control Structures
- PL/SQL records
- Declaring Variables and Constants
- Loops in PL/SQL
- Executing a PL/SQL Block

PL/SQL tables

- Defining PL/SQL tables
- Reasons to use PL/SQL tables
- Populating a PL/SQL table
- Retrieving a PL/SQL table

Triggers in PL/SQL

- Triggers and database events
- Defining a trigger
- Timing a trigger
- Enabling and disabling a trigger

Stored procedures and functions

- Basics of stored procedures
- Basics of functions
- Defining stored procedures and functions
- Function and stored procedures prototypes
- Passing arguments to functions and stored procedures
- Recompiling functions and stored procedures.

CORE JAVA

Object Oriented Programming

- OOPS concepts and terminology
- Advantage of OOPS
- Fundamentals of OOPS

Data types and Variables

- Variable names
- Primitive datatypes, declarations
- Numeric Literals, Character Literals
- String formatting and Parsing
- String Literals
- Arrays, non-primitive data types
- The Dot operator

Syllabus for

6 Month Adv Diploma in Software Programming

Introduction of JAVA

- What is JAVA?
- How to get JAVA
- A first JAVA program
- Compiling and interpreting applications
- The JDK Directory Structure
- Using Eclipse

Operators and Expressions

- Expressions
- Assignment Operator
- Arithmetic Operators
- Relational Operators
- Logical Operators
- Increment and Decrement Operators
- Operate-Assign Operators
- The Conditional Operator
- Operator Precedence
- Implicit Type Conversion
- The Cast Operator
- Strict Typing
- Type conversion

Control Flow Statements

- Statements
- Conditional (if) Statements
- Datatypes and Variables
- Adding an else if
- Conditional (switch) Statements
- While, do while loops, for loops
- A loop diagram
- Enhanced for Loop
- The continue statement
- The break statement

Object Oriented Programming

- Introduction to Object Oriented Programming
- Programming
- Classes and Objects
- Fields and methods
- Encapsulation
- Access Control
- Inheritance and Polymorphism

Methods

- Methods
- Calling methods
- Defining methods
- Method Parameters Scope
- So, why all the static?

Inheritance in JAVA

- Inheritance in JAVA
- Casting
- Methods Overriding
- Polymorphism
- Super keyword
- The Object Class

Packages

- The import statement
- Static imports
- Casting
- CLASSPATH and import
- Defining Packages
- Package Scope

Interface and Abstract Classes

- Separating interface and implementation
- UML interfaces and realizations
- Defining interfaces
- Implementing and Extending interfaces
- Runnable Threads
- Abstract Classes

Lambda Built-in Functional Interfaces

- Java.util function package
- Use primitive versions of functional interface
- Use binary versions of functional interface
- Use the Unary Operator Interface

Exception Handling

- Exceptions overview and catching exceptions
- Exception Methods
- Declaring,defining and throwing exceptions
- Errors and runtime Exceptions
- Assertions

Syllabus for

6 Month Adv Diploma in Software Programming

GRADIENT INFOTECH

Object and Class

- Defining a Class
- Creating an Object
- Instance Data and Class Data
- Methods
- Constructors
- Access Modifiers
- Encapsulation

Collection Framework

- The Collection Framework
- The Set Interface
- Set Implementation Classes
- The List Interface
- List Implementation Classes
- The Map Interface
- Map Implementation Classes
- Utility Classes
- Generics
- Primitive wrapper Classes

Inner Class

- Inner Classes
- Member Classes
- Local Classes
- Anonymous Classes
- Instance Initializers
- Static Nested Classes

Introducing to Threads

- Non- Threaded Applications
- Threaded Applications
- Creating Threads
- Thread States
- Runnable Threads
- Co-ordinating Threads
- Interrupting Threads
- Runnable Interface, threads group

ADVANCED JAVA

Swing

- Swing GUI Components
- Using Swing API

Applet

- Life cycle of an Applet
- A “Hello Word” Applet

JDBC

- Creating a Database and Tables
- Getting Information from Database
- Obtaining Result Set Information
- Connecting a Java program to a Database
- Prepared Statements and Statement Classes in Java
- Inserting, Updating & Deleting Table data

Servlets

- What is a Web Application
- Java Servlets
- What is a Servlet
- Servlet Lifecycle
- Servlet Context
- Session management
- Building the first servlet
- Deploying the servlet

JSP

- What is a JSP Page
- Basic HTML Tags
- JSP Tag Library
- JSP Page Life cycle
- Creating the first dynamic page using JSP
- MVC architecture, 3-tier architecture

Syllabus for

6 Month Adv Diploma in Software Programming

JAVA FRAMEWORK

Jakarta Struts Workshop

- Introduction to MVC1 & MVC2 Architecture
- Overview of Struts Framework
- Components of Model, View & Controller
- Action Classes
- Handling Application Requests
- Generating Dynamic Views
- Validating User Input
- Validator Plug-in
- Working with Tiles
- Deployment Descriptors

Spring Workshop

- Introduction to Spring Framework
- Spring Framework Architecture
- Spring bean wiring
- AOP with Spring
- Transactions management
- Spring with database

Hibernate Workshop

- Introduction to Hibernate
- Object Related Mapping
- Persistent Classes
- Mapping Collections
- Hibernate Query language
- Caching and Transactions
- Hibernate with web applications

MS FRAMEWORK, C# & ASP.NET

Introduction of .NET

- Introduction of .NET 4.5 Framework
- CLR
- CTS
- MSIL
- Garbage Collection

Introduction to Windows Programming

- Windows Programming
- Windows Controls
- Common Controls
- Container Controls
- Menus and Toolbars
- Printing
- Dialogs
- Deploying Windows Application
- Deployment Overview

State Management in ASP.NET

- ASP.Net State Management
- Using View State
- Session state and application state
- Using cookies and URL encoding
- ASP.Net Web Application Security
- Authentication
- Authorization
- Impersonation
- ASP.Net provider model
- Caching
- Output Caching
- Data Caching

Fundamentals of Database

- SQL
- Components of SQL
- Basic SQL Commands
- Triggers and Views
- ADO.Net
- Database Connectivity
- Data Binding
- Data bound controls

ASP .NET Controls and Graphics

- Introduction to ASP.NET
- ASP.Net Web Server Controls
- ASP.Net Page Life Cycle
- User Controls in ASP.Net
- Navigation Control
- Validation Control
- Login Controls
- Dynamic Graphics
- Basic Drawing
- Drawing a custom image
- Placing custom images inside Web Pages
- Image Format and Quality

Cascading Style Sheet (CSS)

- Introduction of Cascading Style Sheet
- Working with CSS
- Types of Style Sheet

Master and Content Pages in ASP.Net

- Creating Master and Content Pages
- Simple Master Page, Nested Master Page
- Configuring Master Page, Creating Themes
- Applying Themes

Introduction of LINQ

- Introduction of LINQ
- LINQ Queries
- Standard Query operators
- LINQ to ADO.Net
- Lambda Expressions
- LINQ to XML

Working with MVC

- Introduction to MS.Net MVC Framework
- MVC Architecture
- How to start an ASP.Net MVC Application
- The folders and files for a new MVC application
- Working with Views
- Working with controls

Web Services

- Web Services and Deployment
- Introduction to WCF, WPF & WF
- Creating a WCF service
- Using on click deployment
- Creating Web API Service

ADVANCE TECHNOLOGIES - HADOOP

Hadoop: Basic Concepts

- What is Hadoop?
- The Hadoop Distributed File System
- How Hadoop Map Reduce Works
- Anatomy of a Hadoop Cluster

Setting up a Hadoop cluster

- Make a fully distributed Hadoop cluster
- Cluster Specification and Installation
- Hadoop configuration

Hadoop daemons

- Master Daemons
- Name node
- Job Tracker
- Secondary name node
- Slave Daemons
- Data Node
- Task Tracker

HDFS (Hadoop Distributed File System)

- Blocks and Splits
- Input Splits
- HDFS Splits
- Methods of accessing HDFS
- JAVA Approach
- CLI Approach

Writing a Map Reduce Program

- Examining a sample map reduce program with several examples
- Basic API Concepts
- The Driver Code
- The Mapper
- The Reducer
- Hadoop's Streaming API
- The configure and close methods
- Sequence Files
- Record Reader
- Record Writer
- Role of Reporter
- Output Collector
- Directly Accessing HDFS
- ToolRunner

Aptitude and Grooming Sessions

Aptitude preparation – According to the World Statistics 70 percent of world's recruitment companies use aptitude test as a part of their recruitment procedure. Aptitude tests are one of the most commonly used assessments in measuring candidate's suitability for a role. Employers wish to be certain that they are going to recruit the right individual who is able to work with company's clients and build up a reputation. Aptitude tests are cost-effective and simple ways for sorting out candidates to select right individuals. Beforehand preparation is very important. The course aims to train the students in Aptitude Test by conducting the sessions by professional Aptitude Trainer.

Grooming Session: At an interview it is extremely important to look, act and dress professionally as you won't have a second chance at making a good first impression. The picture you create will greatly influence your chances of being hired. To groom the students and to build up their confidence, grooming session shall be conducted by the professional team.

Project

To implement the knowledge acquired through various technologies, individual projects shall be assigned to the students. The project shall be completed under the guidance of the concerned faculty. The project shall demonstrate the implementation of technologies which candidates have learnt during the course and by applying the fundamentals of SDLC concept.