Bright Star Institute

302.335.8868

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C / C++ Programmer Certificate

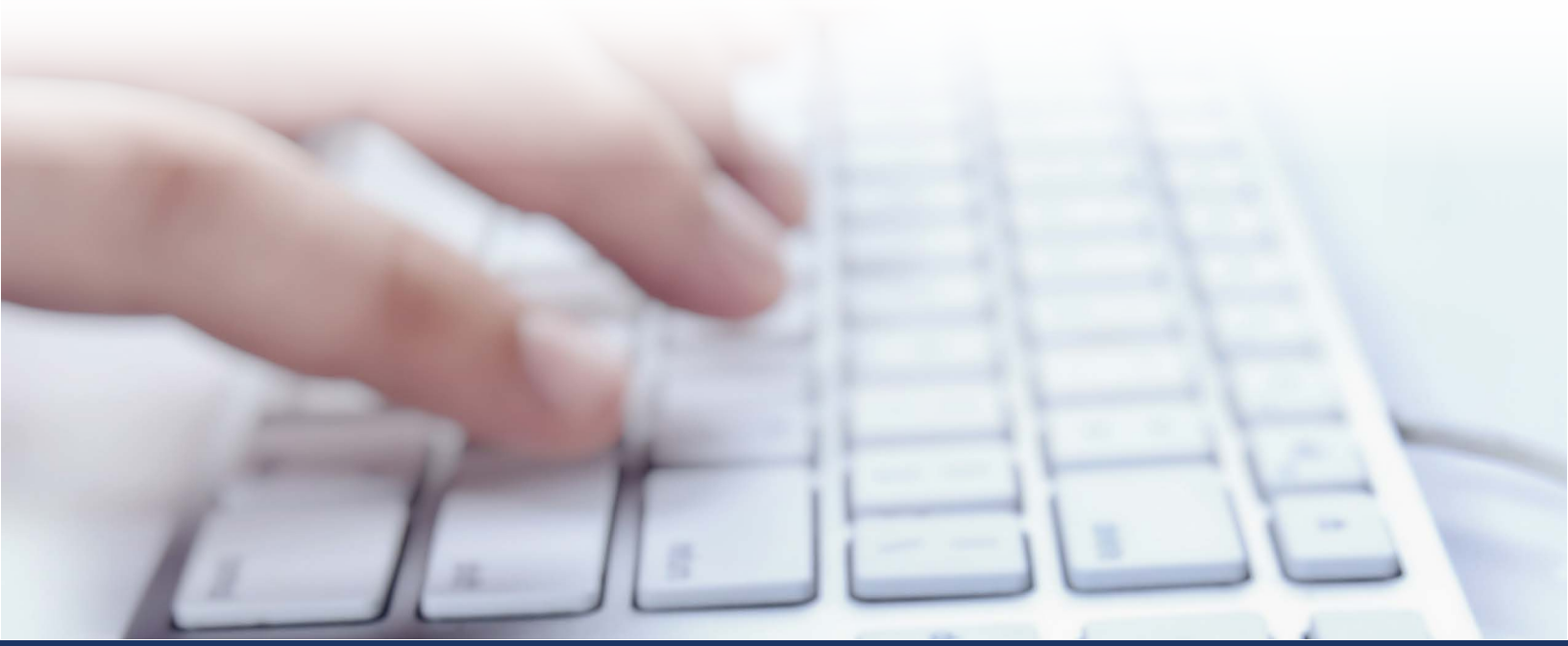
Online, self-paced training that is focused on giving you the skills needed to stand out.

Online learning gives you the flexibility to plan study time around the rest of your day. Our programs combine video, hands-on lab exercises and one-on-one facilitation to enable you to learn as your schedule allows.

Labs are performed via remote access to a dedicated lab machine (unless a student requests to utilize their own equipment). Our unique commitment to student success includes a personal instructor to assure that your courses are completed on time and with full understanding of both the lecture content and the lab exercises.

Course Advisors are available at 302.335.8868 to answer any questions you may have.

Contact Us for a FREE Demo



C / C++ Programmer Certificate Overview

2-course program: $2,800

The C / C++ Programmer certificate program includes coverage of programming in the C and C++ languages.

In the C Programming course, students are introduced to all major language elements including fundamental data types, flow control, and standard function libraries. The C++ course introduces core object oriented programming concepts including inheritance, encapsulation and polymorphism. C++ syntax and style are taught in the context of using object-oriented methods to achieve reusability, adaptability and reliability. Students can utilize Microsoft Visual Studio to complete hands-on labs or a UNIX-based environment if desired.

Required Courses:

Course Name	Duration
C Programming	90 Hours
C++ Programming for C Programmers	90 Hours

Optional Courses:

Course Name	Duration
Object Oriented Analysis & Design with UML	75 hours
SQL Programming	60 hours

Required Courses

C Programming

Duration: 90 hours

Prerequisites: Prior experience with a scripting or programming language is required.

Course Description: This hands on C programming course provides a comprehensive introduction to the ANSI C language, emphasizing portability and structured design. Students are introduced to all major language elements including fundamental data types, flow control, and standard function libraries. Thorough treatment is given to the topics of string and character manipulation, dynamic memory allocation, standard I/O, macro definition, and the C runtime library.

The course explains the use of aggregate structures, unions, and pointers early on so the students can practice extensively in the hands on labs. Structured programming constructs and varargs functions are also covered. Emphasis is given to the processing of command line arguments and environment variables so students will be able to write flexible, user-friendly programs. The course also includes coverage of portability tips drawn from experienced programmers working in production environments. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency.

Students Will Learn:

- C Language Basics and Development Environment
- Fundamental Data Types, Storage Classes and Scope
- typedef and Macros
- Operators and Expressions
- Flow Control Constructs
- Basic Character and Formatted I/O
- Pointers and Dynamic Allocation
- Functions
- Arrays
- Strings and Character Manipulation
- Structures
- Advanced Structures and Unions
- Accessing Command Line Arguments and Environment Variables
- Advanced Macro Design
- C Runtime Library Standard I/O Functions

C++ Programming for C Programmers

Duration: 90 hours

Prerequisites: Prior programming experience with C.

Course Description: This hands on C++ training course presents a thorough introduction to object-oriented programming in C++ for experienced C programmers. The central concepts of C++ syntax and style are taught in the context of using object-oriented methods to achieve reusability, adaptability and reliability. Emphasis is placed on the features of C++ that support abstract data types, inheritance, and polymorphism. Students will learn to apply the process of data abstraction and class design.

Practical aspects of C++ programming including efficiency, performance, testing, and reliability considerations are stressed throughout. Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency.

Students Will Learn:

- Fundamental Features in C++
- Object-Oriented Concepts
- Encapsulation in C++: Introduction to Classes
- Constructors and Destructors
- Operator Overloading
- Inheritance
- Virtual Functions, Polymorphism and Multiple Inheritance
- Streaming I/O
- Templates
- The Standard Library
- Strings in C++
- Exception Handling

Optional Courses

Object Oriented Analysis & Design with UML

Duration: 75 hours

Prerequisites: Knowledge of structured programming concepts.

Course Description: This OOA&D training course presents the key concepts and methodologies required to perform quality object-oriented software engineering, with particular attention to practical techniques such as use-case and CRC analysis, UML diagramming, and patterns. Students practice applying object oriented analysis during the course to improve software designs and to see how software objects can be altered to build software systems that are more robust and less expensive. Students use several methods for analyzing software systems, finding and refining useful classes and relationships between objects. Care is taken not to focus on any one language so that all students can participate in the design exercises without relying on specific programming skills. The course emphasizes the most practical analysis and design methods, including the application of use case analysis, CRC analysis, problem domain analysis, activity diagramming, interaction diagramming, and class diagramming.

The Unified Modeling Language (UML) is presented in detail and is used in the exercises and case studies. Practical aspects of project management and implementation are presented from the perspective of experienced object system designers. Special emphasis is given to the use of object patterns in developing software systems. The students apply their skills in labs that are mini design sessions, during which the instructor helps the students identify and overcome common obstacles that occur during group sessions.

Students Will Learn:

- Object-Oriented Principles
- Introduction to the OOAD Project Lifecycle
- Use Case Analysis
- Class Analysis
- State Machine Diagrams and System Operation Analysis
- Modeling Interactions
- Specification Class Diagramming
- Organizing Large Scale Software

SQL Programming

Duration: 60 hours

Prerequisites: General computer knowledge.

Course Description: This SQL programming course teaches students relational database fundamentals and SQL programming skills. Topics covered include relational database architecture, database design techniques, and simple and complex query skills. This class is intended for analysts, developers, designers, administrators, and managers new to the SQL programming language. Upon completion, participants will understand SQL functions, join techniques, database objects and constraints, and will be able to write useful SELECT, INSERT, UPDATE and DELETE statements.

Comprehensive hands on exercises are integrated throughout to reinforce learning and develop real competency.

Students Will Learn:

- Introduction to Relational Databases and SQL
- Designing Relational Databases
- Creating Databases and Tables
- Working with Records
- JOIN Statements
- Advanced SELECT Statements
- Understanding Subqueries
- SQL Procedural Programming
- Views and Triggers
- Database Security and Transactions