



Object Oriented Design Patterns and Best Practices in C++

Gain the Skills Required to Leverage Design Patterns to Development Solid, Robust and Reusable C++ Applications

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Course Snapshot

- **Course:** TTCP1250: Object-Oriented Design Patterns and Best Practices in C++ | With Gang of Four & SOLID Principles
- **Duration:** 3 days
- **Audience & Skill-Level :** This course is geared for experienced C++ programmers who have current, hands-on C++ coding experience. This course is not for non-developers.
- **Hands-on Learning:** This course is approximately **50% hands-on**, combining expert lecture, real-world demonstrations and group discussions with machine-based practical labs and exercises. Student machines are required.
- **Delivery Options:** This course is available for **onsite private classroom presentation, live online virtual presentation**, or can be presented in a **flexible blended learning format** for combined onsite and remote attendees. Please also ask about our **Self-Paced / Video / QuickSkills or Mini-Camp Flex Hours / Short Course** options.
- **Public Schedule:** This course has active dates on our live-online open enrollment **Public Schedule**.
- **Customizable:** This course agenda, topics and labs can be further adjusted to target your specific training skills objectives, tools and learning goals. Please inquire for details.

Overview

Geared for experienced C++ developers, **Object-Oriented Design Patterns and Best Practices in C++ (with Gang of Four and SOLID Principles)** is lab-intensive hands-on design patterns training course that explores the most common object-oriented design patterns (Gang of Four) and how to use these patterns to develop solid, robust and reusable software development applications. Students will also review essential OO programming concepts.

Working in a hands-on environment, developers will explore key Creational, Structural and Behavior Design patterns and how they used most effectively in building robust, reusable applications. This course combines the use of hands-on coding labs with several “mini-projects” to be completed throughout the training to get the students using and reviewing the Patterns in a practical manner. All lab coding work and examples can be performed working in a C++ development environment. The course also contains several “thinking and drawing” lab exercises as a component of the object-oriented overview portion of the training course.

Learning Objectives

Students will learn how to effectively assign responsibilities using the patterns and principles of SOLID. Throughout the remainder of the course we will explore a wide variety of design patterns, targeting levels of coverage to focus on the most commonly used Patterns, and to simply survey others. Students will compare and contrast patterns and will explore the advantages and disadvantages of using certain patterns for explicit development functions in the C++ environment.

This course consists of approximately 50% hands-on lab work (Patterns). Throughout the course students will be led through a series of progressively advanced topics, where each topic consists of lecture and group discussion. This class is “technology-centric”, designed to train attendees in the most current, effective techniques with the most effective practices.

Need different skills or topics? If your team requires different topics or tools, additional skills or custom approach, this course may be further adjusted to accommodate. We offer additional C++, programming, development, design, testing, services, application security and other related topics that may be blended with this course for a track that best suits your needs. Our team will collaborate with you to understand your needs and will target the course to focus on your specific learning objectives and goals.

Audience & Pre-Requisites

This an **introductory-level** programming course, designed for experienced C++ developers who need to identify, design, and lead the implementation of OO projects. We will explore and apply the terminology, the specification, the processes and technologies specific to OO. Examples are written in C++. Attendees should be familiar with UML and have basic programming experience in C++. This course is not recommended for developers new to C++ programming.

Take Before: Incoming students should have practical skills equivalent to the topics in, or should have recently attended, one of these courses as a pre-requisite:

- TTCP2100: Introduction to C++ Programming

Related Training | C++ Training Series

- TTCP2000 Basic C++ Programming for Non-Programmers
- TTCP2100 Introduction to C++ Programming | C++ Essentials
- TTCP2150 Intermediate C++ Programming | Next-Level C++
- TTCP3103 Advanced C++ Programming
- TTCP1250 Object Oriented Design Patterns and Best Practices in C++
- TTCP1270 SOLID Design in C++

Follow On Courses: Our Skills Academy Developer Tracks include a wide variety of follow-on courses and learning paths for leveraging C++ for next-level development, testing, security and more. Please see our **C++ Developer Training Suite & Learning Paths** list of courses, or inquire for recommendations based on your specific role and goals.

Enhanced Learning Services: Please also ask about our **Pre-Training Class OnRamp & Prep / Primer** offerings, **Skills Gap Assessment Services, Case Studies, Knowledge Check Quizzes, Skills Immersion Programs & Camps, Collaborative Mentoring Services** and **Extended Learning Support & Post Training** services.

Course Topics / Agenda

Please note that this list of topics is based on our standard course offering, evolved from typical industry uses and trends. We'll work with you to tune this course and level of coverage to target the skills you need most. Topics, agenda and labs are subject to change, and may adjust during live delivery based on audience skill-level, interests and participation.

Session: Design Principles

Lesson: Design Goals

- Rotting Design
- Design Goals
- Making it Happen

Lesson: Smells

- Rigidity
- Fragility
- Immobility
- Viscosity
- Needless Complexity
- Needless Repetition
- Opacity

Lesson: SOLID Design

- Single Responsibility
- Open/Close
- Liskov Substitution Principle
- Interface Separation Principle
- Dependency Inversion Principle

Session: Introduction to Design Patterns

Lesson: Introduction to Design Patterns

- Why We Use Patterns
- A Crisp Understanding of Patterns
- Design Patterns in Particular
- Sound Design Principles Implemented by Patterns

Lesson: Patterns and Principles

- Differences Between Principles and Patterns
- Overview of "Gang of Four" Patterns

Session: "Gang of Four" Design Patterns

Each Pattern below will include:

- *Context; Problem; Solution*
- *Components; Implementation*
- *Code Examples; Consequences*
- *Review and Summary*
- *Supplemental Information*

Lesson: Creational Patterns

- Factory Method

- AbstractFactory
- Singleton

Lesson: Structural Patterns

- Façade
- Composite
- Adapter
- Proxy

Lesson: Behavioral Patterns

- Iterator
- Template Method
- Observer
- Command
- State
- Strategy

Session: Working with Patterns

Lesson: Applying Patterns

- Usefulness of Patterns
- Selecting the Right Pattern
- Adapting an Existing Pattern
- Creating a New Pattern Language Considerations

Course Materials: Each participant will receive a **Student Guide** with course notes, code samples, software tutorials, step-by-step written lab instructions, diagrams and related reference materials and resource links. Students will also receive the project files (or code, if applicable) and solutions required for the hands-on work.

Hands-on Setup Made Simple! Our dedicated tech team will work with you to **ensure your student machines and learning environment is setup, tested and ready to go** well in advance of the course delivery date, ensuring a smooth start to class and seamless hands-on experience for your students. We offer several flexible student machine setup options including **guided manual set up** for simple installation directly on student machines, or **cloud based / remote hosted lab solutions** where students can log in to a complete separate lab environment minus any installations, or we can supply **complete turn-key, pre-loaded equipment** to bring ready-to-go student machines to your students or in-person facility. Please inquire for details.

For More Information

All courses can be presented **onsite** or **online**, or in a **combined / flex / blended learning format**, tailored to target your specific audience, needs and learning goals. We also offer focused, flexible **short courses, self-paced learning options, recorded sessions** and more. We train beginner to advanced skills in all areas we cover, and offer **New Hire / Cohort Training, Boot Camps, Skills Immersion Programs, Reskilling Programs, Skills Migration & Transition Programs**, and more. We collaborate with you to ensure all courses are truly targeted to meet your specific needs and learning skills, maximizing your valuable training time, as well as your important budget.

Please also visit our extensive **Public Training Schedule** for training for smaller groups or individuals. Please contact us for course details, **Corporate Rates** and **Special Discount Offers**.

For more information about our dedicated training services, collaborative coaching services, courseware licensing and development services, public course schedule, training management services, partner programs, or to see our complete list of course offerings and special offers please visit us at www.triveratech.com, email Info@triveratech.com or call us toll free at **844-475-4559**. Our pricing and services are always satisfaction guaranteed.

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