Object-Oriented Design and Programming in LabVIEW

Overview
Object-oriented (OO) programming has demonstrated its superiority over procedural programming for solving a variety of problems. Object-oriented design encourages cleaner interfaces between sections of code and results in code that is easier to debug and scales better for large programming teams. Object-oriented programming is the development of code in a language that enforces object-oriented design principles. This course covers the fundamental concepts of object-oriented design and programming and then demonstrates how those concepts are implemented in LabVIEW.

Duration
Classroom: Two (2) days
Online: Three (3) four-hour sessions, plus homework

Audience
- LabVIEW users who need to improve the readability, scalability, maintainability, or reusability of their code
- LabVIEW users who want to develop code that is easier to debug
- LabVIEW users who are familiar with object-oriented programming in other languages and want to know how to implement object-oriented designs in LabVIEW

Prerequisites
- LabVIEW Core 3 or equivalent experience

NI Products Used During the Course
- LabVIEW Professional Development System Version 2010

After attending this course, you will be able to:
- Determine the appropriateness of using an object-oriented approach to develop an application
- Design an application using object-oriented design principles
- Implement a basic class hierarchy using LabVIEW classes
- Use LabVIEW features that provide additional functionality to LabVIEW classes
- Implement an application using common object-oriented design patterns
- Modify an existing LabVIEW application to replace common patterns with LabVIEW objects

Registration
Register online at ni.com/training or call (800)433-3488 Fax: (512)683-9300 info@ni.com

Outside North America, contact your local NI Office. Worldwide Contact Info: ni.com/global

Part Number
910810-xx
-01 NI Corporate or Branch
-11 Regional
-21 Onsite (at your facility)
-69 Online Instructor-led

Suggested Next Courses
- Managing Software Engineering in LabVIEW
- Advanced Architectures for LabVIEW
Object-Oriented Design and Programming in LabVIEW

Day 1
Introduction
Given a development project, the learner will be able to determine if an object-oriented approach should be used for designing and implementing the application.
- What is a Class?
- What is an Object?
- What is Object-Oriented Design?
- What is Object-Oriented Programming?

Designing an Object-Oriented Application
Given a development project, the learner will be able to derive a class hierarchy for the application using object-oriented design principles.
- Object-Oriented Design
- Differentiating Classes
- Identifying Classes and Methods
- Class Relationships
- Common Design Mistakes

Object-Oriented Programming in LabVIEW
Given a development project and a class hierarchy, the learner will be able to develop and use classes in LabVIEW that are readable, scalable, maintainable, and reusable.
- Introduction to Object-Oriented Programming in G
- LabVIEW Classes
- Encapsulation
- Inheritance
- Dynamic Dispatch
- Tools
- Common Use Cases

Day 2
Object-Oriented Tools and Design Patterns
Given a development project and a class hierarchy, the learner will be able to develop an object-oriented LabVIEW application that leverages one or more existing tools or design patterns.
- Object References and Construction Guarantees
- Front Panel Displays for Object Data
- Design Patterns: Introduction
- Channeling Pattern
- Aggregation Pattern
- Factory Pattern
- Design Patterns: Conclusion

Reviewing an Object-Oriented Application
Given a completed LabVIEW application, the learner will be able to review, refactor, and deploy the code using good object-oriented design and programming practices.
- Code Review
- Migrating to LabVIEW Classes
- Deployment
- Additional Resources