

LabVIEW Core 3

Overview

LabVIEW Core 3 introduces you to structured practices to design, implement, test, and deploy LabVIEW applications. This course focuses on developing hierarchical applications that are scalable, readable, and maintainable. Several topics introduced in LabVIEW Core 1 and 2 are revisited and expanded within this context. The processes and techniques covered in this course help reduce development time and improve application performance and stability. By incorporating these design practices early in your development, you avoid unnecessary application redesign, increase VI reuse, and minimize maintenance costs.

Duration

Classroom: Three (3) Days

Online: Four (4) four-hour sessions, plus homework

Audience

LabVIEW and NI Developer Suite users who need to increase performance, scalability, or reuse, and reduce application maintenance costs

LabVIEW users pursuing the Certified LabVIEW Developer certification

Prerequisites

LabVIEW Core 1 and 2, or equivalent experience

NI Products Used During the Course

LabVIEW Professional Development System
Version 2009 or later

After attending this course, you will be able to:

- Establish a software lifecycle for future project development
- Communicate with customers during project definition
- Develop professional user interfaces
- Develop applications that are scalable, readable, and maintainable
- Investigate and implement VI timing techniques
- Handle errors that may occur during code execution
- Document VIs effectively

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

910797-xx

- 01 NI Corporate or Branch
- 11 Regional
- 21 Onsite (at your facility)
- 69 Online

Suggested Next Courses

- Managing Software Engineering in LabVIEW
- Advanced Architectures for LabVIEW
- LabVIEW Object-Oriented Programming System Design
- Data Acquisition and Signal Conditioning

Suggested Certification

- Certified LabVIEW Developer Certification

LabVIEW Core 3 Course Outline

Day 1

Successful Development Practices

This lesson introduces strategies and programming techniques that enable you to create scalable, readable, and maintainable LabVIEW applications. You will learn how to select an appropriate software development lifecycle for your applications. Topics include:

- Scalable, Readable, Maintainable VIs
- Successful Development Practices
- Course Project Overview

Analyzing the Project

This lesson describes the essential steps in the process of analyzing a project. You will learn to describe the differences between functional and non-functional specifications, the importance of developing a requirements document, and how to organize a project into abstract components. Topics include:

- Evaluating the Needs of the Customer
- Communicating with the Customer
- Developing the Requirements Document
- Defining the Application

Designing the User Interface

This lesson introduces key concepts to consider when designing a user interface for applications. You will learn techniques to organize and design a readable user interface, the value of developing a front panel prototype, and how to develop a user interface that can be easily localized.

Topics include:

- User Interface Design Issues
- User Interface Layout Issues
- Front Panel Prototyping
- User Interface Example
- Localizing User Interfaces

Designing the Project

This lesson introduces the different components of a software design. You learn to select an appropriate design pattern, utilize an event structure, implement user events, design a hierarchical application, utilize the **Project Explorer**

window, design data types, restrict access to data, and select an appropriate error handling strategy.

Topics include:

- Design Patterns
- Event-Based Design Patterns
- Advanced Event-Based Design Patterns
- Creating a Hierarchical Architecture
- Working with LabVIEW Projects
- Choosing Data Types
- Information Hiding
- Designing Error Handling Strategies

Day 2

Implementing the User Interface

This lesson introduces techniques to improve the way you implement user interfaces and their usability. You will learn to compare and contrast different methods of displaying data and to create consistent, meaningful icons and connector panes.

Topics include:

- Implementing User Interface-Based Data Types
- Implementing Meaningful Icons
- Implementing Appropriate Connector Panes

Implementing Code

This lesson focuses on techniques and programming practices to create algorithms and modular VIs for your applications. You will learn to initialize a design pattern, implement data structures, develop an application that follows the LabVIEW Style Guidelines, implement execution and software control timing, develop scalable and maintainable modules, and implement an error handling strategy.

Topics include:

- Implementing a Design Pattern
- Practicing LabVIEW Style Guidelines
- Timing a Design Pattern
- Developing Scalable and Maintainable Modules
- Implementing an Error Handling Strategy

LabVIEW Core 3 Course Outline

Day 3

Implementing a Test Plan

This lesson introduces different methods for testing VIs. You will learn to describe the value of reviewing the design and implementation of each module, implement functional and error checking tests for individual modules, integrate code modules into a single application, conduct functional and regression tests as each module is integrated, and compare and contrast different types of system-level tests.

Topics include:

- Verifying the Code
- Implementing a Test Plan for Individual VIs
- Implementing a Test Plan for Integrating VIs
- Implementing a Test Plan for the System

Evaluating VI Performance

This lesson describes recommended methods and tools in LabVIEW to evaluate and improve VI performance. You will learn to identify and correct memory and execution speed issues.

Topics include:

- Identifying Performance Problems
- Using VI Metrics to Identify VI Issues
- Fixing Performance Problems

Implementing Documentation

This lesson describes techniques to implement documentation for VIs and suggestions for documentation standards in organizations. You will learn to create documentation for end-users and other developers.

Topics include:

- Designing Documentation
- Developing User Documentation
- Describing VIs, Controls, Indicators
- Creating Help Files

Deploying the Application

This lesson describes techniques to improve the process of building a stand-alone LabVIEW application. Topics include:

- Implementing Code for Stand-Alone Applications
- Building a Stand-Alone Application
- Building an Installer