

## LabVIEW Basics II: Development Course

### Overview

The LabVIEW Basics II course prepares you to design complete, stand-alone applications in LabVIEW. This course is a logical extension of the LabVIEW Basics I course and is aimed at making the student successful in creating applications for research, engineering, and testing environments. This course covers proper design techniques, implementation of complete LabVIEW solutions, DataSocket technology, advanced file I/O, networked environments, and error handling.

**Duration** – Two Days

### Audience

- New LabVIEW or NI Developer Suite users and users preparing to develop applications
- LabVIEW Basics I course attendees
- Users and technical managers evaluating LabVIEW or NI Developer Suite in purchasing decisions
- LabVIEW users pursuing the Certified LabVIEW Developer certification

### Prerequisites

- Experience with Microsoft Windows. LabVIEW Basics I: Introduction course or equivalent experience

### NI Products Used During the Course

- LabVIEW Professional Development System Version 7
- E-Series DAQ board
- DAQ Signal Accessory

### REGISTRATION

Register online at [ni.com/training](http://ni.com/training) or call (800) 433-3488 • Fax: (512) 683-9300  
[info@ni.com](mailto:info@ni.com)

Outside North America, contact your local NI office. Worldwide Contact Info: [ni.com/global](http://ni.com/global)

NI can also hold this class onsite at your facility.

**Part Number** 910017-xx

-01 NI Corporate or Branch, -11 Regional, -21 Onsite

### After attending this course you will be able to:

- Design and implement stand-alone applications using LabVIEW
- Create logical, re-usable applications that conform to accepted programming design standards
- Take advantage of network technologies for data exchange
- Create applications that have a professional look and feel
- Create customized file input/output formats to match your data

### Suggested Next Courses

- LabVIEW Advanced: Performance and Communication
- Data Acquisition and Signal Conditioning
- LabVIEW Instrument Control

## LabVIEW Basics II: Development Course Outline

### Day 1

#### Planning LabVIEW Applications

This lesson describes some of the issues involved when developing LabVIEW applications, including the design process, the organization of subVI components, and the process of combining those components to create a complete application. This lesson also describes common LabVIEW programming architectures along with some tools to help you build VIs. Topics include:

- Design process overview and implementing large LabVIEW applications
- Choosing the right programming architecture for your application
- Creating menus with Boolean clusters
- Creating VIs from templates

#### VI Design Techniques

This lesson describes good techniques for designing and building VIs. The techniques discussed include an overview of user interface design issues, good block diagram construction and wiring techniques, error handling, and an overview of LabVIEW run-time menus. All these techniques are important as you design and build more involved and complex VIs. Topics include

- Basics of user interface design
- Good programming techniques when creating modular, reusable block diagrams
- Using proper documentation conventions
- Implementing error handling in LabVIEW
- Learning how to organize development files in an easy to use hierarchy
- Using Sequence Structures to control program execution
- Learning how to develop an application that uses Run-Time Menus

#### Object Properties

This lesson describes the use of object properties to modify front panel objects. Properties you can modify include color, size, position, behavior, and more. The first part of the lesson focuses on properties for simple front panel objects. The second part of the lesson describes properties associated with graphs and charts. Finally, this lesson describes control references and their advantages in modifying properties from subVIs. Topics include:

- Programmatically controlling the user interface with property nodes
- Customizing charts and graphs with property nodes
- Using control references to change properties from subVIs
- Using Type Definitions to create data types that can be easily modified and reused

## Day 2

### Local and Global Variables

This lesson describes techniques for passing data without the use of wires. This concept is powerful and must be used carefully in VIs. The first section of this lesson discusses data management. Local variables are then introduced, followed by global variables. The end of the lesson describes when variables should and should not be used in VIs. Topics include:

- Implementing local and global variables to pass data within a VI and between VIs
- Understanding when variables are appropriate for use in a VI

### Advanced File I/O Techniques

In the LabVIEW Basics I course you learned the fundamentals of file I/O. This lesson describes advanced file I/O techniques. For example, one data format may have advantages over a different data format for your application. In addition, you may need to optimize the speed of your file I/O operations. Both the data format and the structure of your file I/O routines affect speed, so careful planning may be required. This lesson provides the in-depth understanding required for effective, flexible file I/O operations. Topics include:

- Understanding byte stream file types
- Storing data in binary file formats
- Retrieving data in a random access file format
- Creating your own file formats with Datalog type file input/output

### Project Management

This lesson describes some of the issues involved when building larger LabVIEW projects, including the design process, the organization of subVI components, and the process of creating a complete application. Topics include:

- Assembling your LabVIEW application
- Using the project management features built into LabVIEW

### Remote Data Management

This lesson describes the capabilities built into LabVIEW that allow you to easily work with networks. You can pass data between LabVIEW VIs on interconnected computers, and control VIs running on one computer from another computer. LabVIEW provides the high-level tools needed to make these interconnections so you can acquire, analyze, and present data from anywhere in your business. Topics include:

- Transferring data over networks using DataSocket technology
- Using the LabVIEW Web Server to display information remotely
- Viewing and controlling a running LabVIEW application remotely from LabVIEW and a Web browser