



COURSE DESCRIPTION

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LabVIEW Basics I: Introduction

Overview:

The LabVIEW Basics I course introduces students to the LabVIEW environment, features, and dataflow programming. At the end of Basics I, one can create applications that acquire, process, display, and store real-world data. It is an excellent course for quickly getting up to speed with LabVIEW. The format of this course enables you to immediately apply programming concepts with its hands-on approach to learning.

Who Should Attend:

- New LabVIEW users
- Users and technical managers evaluating LabVIEW in purchasing decisions
- LabVIEW users pursuing the Certified LabVIEW Developer certification

After attending this course you will be able to:

- Develop PC-based data acquisition, analysis, and display applications
- Create user interfaces with strip charts, graphs, and buttons
- Acquire analog waveforms using a data acquisition board
- Perform measurements, store the data in a file, and retrieve it later
- Use an instrument driver
- Collect temperature data using temperature sensors and log it to a file
- Save data in files that you can retrieve with a spreadsheet program
- Control a GPIB instrument
- Develop applications that use the serial port
- Develop modular and reusable functions

Prerequisites: Experience with Microsoft Windows. Programming experience is helpful.

LabVIEW Basics II: Development

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, optimizing speed and memory usage, networked environments, and error handling.

Who Should Attend:

- New LabVIEW users and LabVIEW users who are preparing to develop projects
- LabVIEW Basics I attendees
- Users and technical managers evaluating LabVIEW in purchasing decisions
- LabVIEW users pursuing the Certified LabVIEW Developer certification

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
- Improve the execution speed of your application
- Optimize memory used by your application
- 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

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



LabVIEW Intermediate I: Successful Development Practices

Overview:

This course teaches you structured practices to design, develop, test and deploy LabVIEW applications. You will learn good LabVIEW application development techniques such as hierarchical VI development, state machines, appropriate user interface design, error handling strategies and effective documentation. Learn to unlock the full LabVIEW potential to create optimized applications that acquire, process, display, and store real-world data.

Who Should Attend:

- 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

After attending this course you will be able to:

- Analyse your application requirements, choose the correct design pattern and data structures for your application, and quickly test your design
- Reduce your development time and improve application performance and scalability
- avoid unnecessary application redesign, increase VI reuse, and minimize maintenance costs

Prerequisites: LabVIEW Basics I & II, or equivalent experience

LabVIEW Intermediate II: Performance and Connectivity

Overview:

This course builds on the skills taught in LabVIEW Intermediate I by teaching you memory management and performance-enhancing techniques to maximise your application performance. This course is specially designed for those needing to maximise performance or extend functionality of LabVIEW application.

Who Should Attend:

- 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

After attending this course you will be able to:

- Use advanced data management and synchronization techniques such as multi-threading, priorities, and event programming in LabVIEW
- Use LabVIEW with ActiveX and .NET
- Understand performance and memory issues, including how VI instruments use memory
- Extend application functionality by borrowing the capabilities of other applications using connectivity technologies such as DLLs, Active X, and the internet, further reducing your development time.

Prerequisites: LabVIEW Intermediate I or equivalent LabVIEW experience



LabVIEW Instrument Control

Overview:

This course teaches you how to develop LabVIEW applications to configure and control GPIB, serial and PXI instruments. You will learn the use of virtual instrument software architecture (VISA) functions - a single interface to configure and control GPIB, serial and VXI instruments and the use of interchangeable virtual instruments (VI) drivers.

Who Should Attend:

- Users preparing to develop measurement applications using LabVIEW, and GPIB, serial or computer-based instruments
- LabVIEW Basics I attendees
- Users and technical managers evaluating computer-based instruments in purchasing decisions

After attending this course you will be able to:

- Quickly develop integrated, high-performance instrument control applications that produce accurate results

Prerequisites: Experience with Microsoft Windows; LabVIEW Basics I course, or equivalent experience

LabVIEW Real-Time Application Development

Overview:

This introductory hands-on course teaches students how to develop real-time applications using the LabVIEW Real-Time Module and FieldPoint 2000 Series real-time controller. The course begins by teaching you how to install, configure, and communicate with real-time FieldPoint hardware. It then progresses into concepts of real-time and determinism and how to use LabVIEW Real-Time for embedded control, data logging, and real-time network communication.

Who Should Attend:

- New LabVIEW Real-Time developers using FieldPoint distributed I/O and those developing industrial applications

After attending this course you will be able to:

- Use LabVIEW Real-Time for embedded control, data logging and real-time network communication

Prerequisites: LabVIEW Basics I course or equivalent experience; Data Acquisition and Signal Conditioning course or equivalent recommended

Data Acquisition and Signal Conditioning

Overview:

Using LabVIEW, plug-in DAQ boards, and SCXI signal conditioning hardware, the Data Acquisition and Signal Conditioning course teaches you the fundamentals of PC-based data acquisition and signal conditioning. During the course you get hands-on experience with installing and configuring data acquisition hardware and learn to use data acquisition software functions to build your application. Although LabVIEW is the application software used during the class, users using only the NI-DAQ API will also benefit by learning about analog input, analog triggering, signal conditioning, signal processing, analog output, digital I/O, and counters. By the end of the course, you will know how to develop integrated, high-performance data acquisition systems that produce accurate measurements.

Who Should Attend:

- Developers and users using LabVIEW, DAQ and/or signal conditioning to create data acquisition and control applications
- Developers using NI-DAQ API (with C or Visual Basic) to create DAQ applications
- Users new to PC-based data acquisition and signal conditioning
- Designers and users of measurement and control systems

After attending this course you will be able to:

- Properly connect transducers such as thermocouples and strain gauges to your measurement hardware
- Use LabVIEW DAQ VIs to perform single point and continuous measurements
- Use Measurement and Automation Explorer (MAX) to configure your data acquisition and signal conditioning hardware
- Eliminate measurement errors due to under sampling and signal grounding techniques
- Start your measurements using hardware and software triggering
- Use signal processing (windows and digital filters) to improve quality of acquired signals
- Control relays and lights using analog output and digital I/O signals
- Make pulse, frequency, and position measurements using counters
- Generate single and continuous waveforms

Prerequisites: LabVIEW Fundamentals (Basics I and II) course or equivalent experience

Machine Vision and Image Processing

Overview:

National Instruments IMAQ and Vision products give you the flexibility to address the needs of your research, test and measurement, and industrial automation vision applications. The course will teach the fundamentals of machine vision, the components that make up a machine vision system, and the various resources for locating appropriate cameras, lenses, and lighting equipment. Students use vision software and hardware to calibrate coordinates and to acquire and quantify images.

Who Should Attend:

- New users and developers of National Instruments IMAQ and Vision products

After attending this course you will be able to:

- Develop vision applications with greater ease and efficiency
- Understand the fundamentals of building a complete machine vision system
- Understand the basics of National Instruments IMAQ hardware and software

Prerequisites: LabVIEW Basics I course or equivalent experience



LabWindows/CVI Basics I

Overview:

The LabWindows/CVI Basics I course prepares you to create your own applications using LabWindows/CVI. After completing this course, you will have mastered the LabWindows/CVI programming environment, and will be able to create basic solutions using many of the built-in features of LabWindows/CVI. By the end of the course, you will know how to develop applications using the LabWindows/CVI programming environment.

Who Should Attend:

- New LabWindows/CVI users
- Users and technical managers evaluating LabWindows/CVI in purchasing decisions

After attending this course you will be able to:

- Develop your applications within the LabWindows/CVI environment
- Create professional-looking user interfaces with strip charts, graphs, and buttons
- Acquire analog waveforms using a DAQ board
- Perform measurements, store the data in a file, and retrieve it later
- Use an instrument driver
- Collect temperature data using temperature sensors and log it to a file
- Save data in files that you can retrieve with a spreadsheet
- Control a GPIB instrument
- Develop stand-alone LabWindows/CVI applications
- Analyze your data using the analysis functions
- Develop applications that use the serial port

Prerequisites: C Primer course or recent C programming experience

LabWindows/CVI Basics II

Overview:

The LabWindows/CVI Basics II course, a follow-up to the Basics I course, is ideal for intermediate users. After attending the course, you will design powerful applications that use Internet communication and ActiveX. You will learn how to build ActiveX servers and develop clients to control ActiveX applications. You will create powerful user interfaces using active menus, canvas controls, Open GL, and toolbars.

Who Should Attend:

- New and intermediate LabWindows/CVI users
- LabWindows/CVI Basics I attendees
- Users and technical managers evaluating LabWindows/CVI in purchasing decisions

After attending this course you will be able to:

- Create elaborate user interfaces with toolbars and menus
- Use ActiveX within the LabWindows/CVI environment
- Compile your modules as DLLs so they can be used with other applications
- Develop efficient multithreaded applications
- Use advanced development tools to display memory and browse your source code
- Develop applications that can communicate with the Internet

Prerequisites: Experience with Microsoft Windows. Programming experience is helpful.

TestStand I: Introduction

Overview:

The TestStand I: Introduction course teaches you to use features provided in the TestStand environment. Upon completion of this course, a user can develop practical test applications using the built-in tools supplied with TestStand.

Who Should Attend:

- New TestStand users
- Engineers and developers tasked with maintaining already-built test sequences
- Users and technical managers evaluating TestStand in purchasing decisions
- TestStand users pursuing the Certified TestStand Developer certification

After attending this course you will be able to:

- Develop practical test applications in the TestStand environment and distribute them to test stations
- Build test code and interface it to TestStand
- Understand how a test executive functions
- Log test results to a database

Prerequisites: Familiarity with LabVIEW, or LabWindows/CVI

TestStand II: Customization

Overview:

Building on TestStand I: Introduction course, the TestStand II: Customization course demonstrates how to customize the functionality built in to TestStand. Using the ability to customize items (such as the operator interface, data types, step types and process model), developers can build applications that match their test needs.

We cover advanced features of the TestStand environment, such as multithreading and multi-UUT (Unit Under Test) testing, advanced database logging and reporting techniques, and using the TestStand application program interface (API). This course also contains information on how to integrate advanced user management into your test management system, and concludes with system design projects that present possible system designs and implementations.

Who Should Attend:

- New TestStand users
- Users and technical managers evaluating TestStand in purchasing decisions
- TestStand I: Introduction course attendees
- TestStand users pursuing the Certified TestStand Developer certification

After attending this course you will be able to:

- Develop customized TestStand applications
- Harness the power of testing multiple units under test
- Use advanced logging and report generation

Prerequisites: TestStand I: Introduction course or equivalent experience;. Knowledge of test executive software and familiarity with LabVIEW, LabWidows/CVI or C programming required.