



Programmable Logic Training Courses

Course Information and Schedule March 1996 through December 1996

(Latest schedule is also available on web at <http://www.xilinx.com>)

Who Should Attend a Training Class?

All users of Xilinx products should attend one of our Training Courses. Attending a Xilinx Training Course is one of the fastest and most efficient ways to learn how to design with FPGA or CPLD devices from Xilinx. Hands-on expert instruction with the latest information and software will allow you to implement your own designs in less time with more effective use of the devices.

Xilinx offers a variety of classes to meet your specific needs. Training centers around the world schedule classes on a regular basis, and the class can even be brought to your own facility.

Not only design engineers, but also test engineers, component engineers, CAD engineers, technicians, and engineering managers may want to attend a class in order to understand the Xilinx products.

What You Will Learn

Not only will you learn about our products, but we will recommend the best ways to use the software based on our years of experience with thousands of designs. You will learn how to efficiently enter, implement, and verify your design. The powerful yet easy-to-use Xilinx development system allows you to utilize the Xilinx automatic mode, or take a power-user approach and direct the automatic tools to the best implementation of your design.

Prerequisites

Students need only have a background in digital logic design. Basic familiarity with the PC or workstation is helpful but not required. It will benefit you to learn your design entry tool of choice before attending the Xilinx class, including an HDL language for the synthesis-based classes. Update or Advanced classes require previous experience with the Xilinx products.

If you would like to prepare for the training class to maximize your learning, you should complete the tutorials available in the development system. There are tutorials available for the third-party tools for which Xilinx sells the interface, and interactive, animated tutorials for many of the Xilinx tools with graphical user interfaces.

Benefits

Start or Complete Your Design During the Training Class

Bring your design to the course and consult with the instructor. Class size is limited to allow more interaction. You can spend extra time getting your design completed before you return home. Call to see if your design entry tool will be available at the class.

Reduce Your Learning Time

Extensive Xilinx documentation and tutorials provide the information you need to complete your design. But attending the Training Course for focused, interactive learning is faster than a question-and-answer approach on your own. Instead of interruptions and piecemeal self-education, you will quickly become your company's expert in Xilinx designs.

Make Fewer Design Iterations

By learning the proper approach, you will save time and expense in prototyping and debugging designs. However, if you do need to make changes to your design, you will learn how to do this quickly and efficiently.

Get to Market Faster

Getting your product to market faster is probably one of the key reasons you are using Xilinx products in the first place. Studies have shown that time-to-market often has a greater effect on profits than development costs. Training will allow you to get your product to market on schedule, allowing your company to reap the rewards that follow.

Lower Production Costs

By learning how to use the device effectively, you may be able to get more logic into a smaller device, or operate at a higher speed. As a result, you may be able to save on the cost of the device itself, and the surrounding logic on your board.

Increase Quality

Effective verification techniques will prove the quality of your Xilinx-based design. Higher quality leads to reduced maintenance and repair costs, and improved customer satisfaction.

What Others Have Said

Our students overwhelmingly say they would recommend the class to others. Here are some unsolicited comments we have received:

“Great class! Had a lot of fun and it was chocked full of little clues and tips unfound in the data book.”

“Questions and special issues were handled very well.”

“Excellent instructors! The class material is very well prepared. I believe my time is well worth it.”

“Instructors are well informed; accessibility of applications personnel is a definite plus.”

“The organization of the course is very well done! I leave the class with a high degree of confidence that I can design with Xilinx parts intelligently.”

“A great fill-in-the-gap course for semi-experienced Xilinx users.”

“I’m very pleased with this course. I believe it will take 3-4 weeks off of my initial learning curve.”

Time and Cost Savings

Attending a Xilinx Training Class is an investment that will pay for itself with the first Xilinx design that you begin. The classes are fast-paced, each providing as much information as possible in the short time available. Hands-on experiences throughout the classes make sure that the information is retained and applied to practical applications. Just as Xilinx products reduce your development time, attending a Training Course can reduce your design time. The person attending the class will be an in-house expert who can be utilized by other members of your company.

You can reduce your travel costs by attending a class scheduled in your area, or having the class brought right to your facility. The tuition pays for the course notes and expert, in-person instruction, which can be priceless when trying to meet a schedule.

The Training Classes

Hands-On Experience

Each class includes over two hours each day for hands-on labs. There is at least one computer for every two people in the class.

Workstation-based Classes

When necessary, Xilinx offers classes on workstations. For example, the current synthesis class uses Synopsys tools, which are workstation-based.

Xilinx also offers a schematic-based class using workstations. The new XACT^{step} 6.0 tools were first made available on the PC, so the workstation-based class continues to use the previous graphical interface. When the workstation software uses the same graphical interface as the PC later in 1996, the schematic classes will all be held on PCs. Classes are always kept up-to-date with the latest production products. Workstation-based classes are held at Xilinx headquarters, and can be brought on-site.

Instructors

Xilinx Training Courses have been successfully held worldwide for over six years. The instructors are Xilinx experts who are skilled at passing that knowledge on to fellow engineers. A dedicated Training organization at Xilinx works closely with the Applications and Engineering groups to keep the classes up-to-date with the latest improvements and recommendations for Xilinx and third-party tools.

Course Materials

All course materials are supplied by Xilinx. Every student gets an excellent reference tool in the form of course notes, which include all the material presented during the class. The course notes are bound for easy use and include additional reference material beyond what is covered in the class.

Most classes include a full lunch, with morning and afternoon snacks. Let the registrar know if you have any special dietary needs when registering for the class.

Product Coverage

Xilinx classes will cover the latest released versions of our devices and development systems. While all available products are covered, emphasis is placed on the more popular and/or recommended solutions. New products are added to the class as they become available. If you have any questions on coverage of a particular product, please call Xilinx Training.

Schematic-Based Course Outline

The schematic-based Xilinx Training Class lasts three days. All North American training sites, and most international locations, teach the same class.

Introduction

- Development System Overview
- Architecture Overview

Xilinx Design Flow

- Schematic Entry Guidelines
- Design Manager*
- Flow Engine* Automatic Translation

Timing Specification

- XACT-Performance* Delay Specification
- Static *Timing Analyzer*

Designing for Xilinx FPGAs

- Combinatorial Logic
- Registered Logic
- Memory Design
- I/O Design
- X-BLOX* Module Generation

Designing for Xilinx CPLDs

Text Entry Guidelines

- Xilinx-ABEL* software

Floorplanning

- Incremental Design
- XACT-Floorplanner*
- Relationally-Placed Macros

Timing Analysis

- Good Design Practices
- Simulation Guidelines

Configuration

- Programming Modes
- Bitstream Generator*
- PROM File Formatter*
- Hardware Debugger* Downloading & Readback

Synthesis-Based Classes

Designing with high-level languages (VHDL and Verilog) and synthesis tools can be very different from using schematic entry. As a result, Xilinx offers classes that focus on VHDL and Verilog design entry for Xilinx products. The schedule reflects synthesis-based classes scheduled at Xilinx Headquarters in San Jose, CA. The same classes are available for customer-site training. The classes are designed for new Xilinx users, as with the standard class. Xilinx highly recommends the synthesis-based class for anyone using VHDL or Verilog for design entry.

Special Synthesis Topics

Synthesis-based classes include the following additional topics, using HDL code for design entry:

Good coding styles

Efficient coding for synthesis to Xilinx architectures

Implementation tradeoffs of different constructs

Hierarchy within synthesis

Synthesis design flow

Recommended options within the synthesis tool

Controlling Xilinx implementation tools with synthesis

Synthesis-Based Course Outline

Following is a complete outline of the three-day synthesis-based class:

Introduction

FPGA Architecture

Xilinx-Synopsys Design Flow

Good Coding Styles

Synopsys Scripts

Design Manager

Automatic Translation

Timing Specification

XACT-Performance Delay Specification

Static Timing Analyzer

Simulation Guidelines

Good Design Practices

Coding for Xilinx FPGAs

Combinatorial Logic

Carry Logic and *X-BLOX* Module Generation

Registered Logic

I/O Design

Memory Design
Hierarchy
Floorplanning
 Incremental Design
 XACT-Floorplanner
Configuration
 Programming Modes
 Bitstream Generator
 PROM File Formatter
 XChecker Downloading & Readback

Update and Advanced Training Classes

If you have already attended a Xilinx class or have experience using Xilinx products, consider attending a one-day Update or Advanced Training session. These sessions will be most useful if you have the latest software.

Update Classes

One-day Update classes focus on the latest released products from Xilinx, describing them in relation to previous versions. For example, an Update class is available describing the new features in XACTstep 6.0. The class will be offered for a limited time at regional sites, or can be brought to your facility. Browse the Xilinx web site (<http://www.xilinx.com>) for the latest information regarding special Update classes on new products from Xilinx.

Advanced Training Classes

If you have already attended a Xilinx class or have experience using Xilinx products, consider attending a one-day Advanced Training session. Advanced Training classes are offered at no charge to current in-warranty Xilinx customers; otherwise tuition is \$200. Advanced Training sessions can vary according to the interests of the students. Popular topics include:

- Example Logic Design Techniques
- Timing Analysis and Avoiding Timing Hazards
- Design Methodology for Tough Designs
- Details of Advanced Optimization Capabilities
- XACT Design Editor
- Floorplanning

Advanced Training classes are held regularly at Xilinx headquarters, and sometimes at regional locations, but are replaced by Update Classes when appropriate. See the web site for scheduled classes, or contact Xilinx Training to hold an Advanced Training session at your site.

Training Locations

Xilinx Headquarters

Classes are held regularly at Xilinx headquarters in San Jose, California. During the class, you may elect to meet one-on-one with Xilinx Applications engineers to discuss specific issues not covered in the class. Topics may include using a specific third-party tool, optimizing your particular design, or more advanced issues beyond the coverage of the class.

North American Distributor Locations

Xilinx distributors sponsor training classes jointly with Xilinx, using the same material as the headquarters classes. Since the distributor sponsors the class, the tuition cost is often reduced to \$495 for customers of the sponsoring distributor. Check with the distributor when registering. Locations include over fifty cities across North America. Contact your local distributor, or Xilinx headquarters, for information on classes in your area.

International Locations

Xilinx classes are held throughout Europe, Asia, India, Israel, South Africa, Australia, South America, and other international locations. Classes vary in length and tuition, but are based on the same material used in North America. The schedule lists some of these classes. Contact your local Xilinx sales office or representative for classes in your area.

Customer-Site Classes

Xilinx can bring the Training Course to your own facility for the greatest convenience to your company.

On-Site Classes Provide Additional Benefits:

No Travel Costs

On-site Xilinx training classes eliminate travel time and expenses:

- No airfare
- No hotel bills
- No car rental

Classes Tailored To Your Needs

On-site classes can be tailored to meet the specific needs of your company:

- Convenient class time and location
- Projects of a proprietary nature can be discussed openly
- Students can use their own equipment and begin an actual design right in class

Costs: North America

Prices start at \$4,500 for a minimum class size of six students.

Costs: International

- Prices vary; contact your local Xilinx sales representative.

Included in class fees:

- A Xilinx-certified instructor
- Training materials for each student
- PC for every two students (or if you prefer, the training labs can be done on your PCs or workstations)

Scheduling a Class

To schedule a training class at your facility and determine pricing, call the Xilinx sales office nearest you, or your local Xilinx sales representative. On-site training classes are popular, so the more advanced notice we have, the better our ability to schedule your class exactly when you want it.

Registration

Tuition

Class tuition in North America is \$1,000 per student for the three-day classes, including the synthesis-based and workstation-based classes at Xilinx headquarters. The distributor-sponsored, schematic-based classes are offered at a reduced rate of \$495 for customers of the sponsoring distributor. Check with the distributor when registering. On-site classes start at \$4500 per class, and vary according to the class and the number of students. For specific pricing of on-site classes, call the Xilinx Training Registrar or your local sales office. For international locations, call the local registrar for pricing.

Location	Tuition	Benefits
North America		
Xilinx Headquarters	\$1000	- Can meet with applications engineers - Classes held frequently - All class types available
Distributor Locations	\$495	- Lower cost for distributor's customers; local
Customer Site	Starts at \$4,500	- Convenience; can cover specific issues
Update	Typically \$100	- One day, focus on new products
Advanced	Free	- For experienced, in-warranty users
International		
International Locations	Varies	- Offered in over 21 countries; native language
Customer Site	Varies	- Convenience; can focus on specific issues

Money-back Guarantee

We are so confident you will be satisfied with the benefits of a Xilinx training class that we offer the following guarantee:

- *Full refund of the class cost if you are not completely satisfied.*

Enrollment

To enroll, call the registrar for the location where you would like to attend a class. Or you may call the Training Registrar at Xilinx headquarters at (408) 879-5090 or contact your local sales office. You may also fax the registration form to the registrar.

Class size is limited, so early enrollment is recommended. Students are considered enrolled only after a check, money order, or purchase order for the course tuition has been received. Please mail your payment to the registrar of the location of your training class. For Xilinx-sponsored classes, make checks/P.O. payable to Xilinx, Inc.

Enrollments will be acknowledged with a confirmation letter. **Please call if you have any questions or do not receive a confirmation letter.**

Early Enrollment Discount

We encourage you to sign up early, as classes may fill up quickly. At Xilinx headquarters, if we receive your payment or purchase order three weeks or more before the start date of the class, you will get a 10% discount on the tuition.

Cancellations

Course tuition is fully refundable up to two weeks before the scheduled course starts. Cancellations within two weeks of the scheduled course will incur a 25% cancellation fee. Cancellations within one week of the scheduled course date may only be applied toward a future course date. Rescheduling is allowed until three working days before the start of class. Student substitutions may be made at any time.

Xilinx Training Registrar

**Stacey Pinckert
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Register on-line: <http://www.xilinx.com>**
