Publication date : 03/21/2024

Course : VHDL, design for FPGA targets

Practical course - 4d - 28h00 - Ref. VHD
Price : 2550 € E.T.

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This course will enable you to acquire general skills in the use of VHDL, a language designed to represent the behavior and architecture of a digital electronic system. You'll be able to discover this language and develop your first VHDL project.

Teaching objectives

At the end of the training, the participant will be able to:

- Get to grips with the VHDL language and its many possibilities
- Know the essential syntax and constructs used in FPGA design
- Produce high-quality VHDL code that complies with FPGA synthesis constraints
- Functionally simulate a design by applying stimuli to it by writing a simple benchmark test

Intended audience

Engineers and technicians wishing to acquire general skills in the use of VHDL for FPGA design.

Prerequisites

No special knowledge required.

Practical details

Hands-on work

Use different examples to visualize VHDL concepts and develop a design flow from writing code to routing placements.

Course schedule

PARTICIPANTS

Engineers and technicians wishing to acquire general skills in the use of VHDL for FPGA design.

PREREQUISITES

No special knowledge required.

TRAINER QUALIFICATIONS

The experts leading the training are specialists in the covered subjects. They have been approved by our instructional teams for both their professional knowledge and their teaching ability, for each course they teach. They have at least five to ten years of experience in their field and hold (or have held) decision-making positions in companies.

ASSESSMENT TERMS

The trainer evaluates each participant's academic progress throughout the training using multiple choice, scenarios, hands-on work and more.
Participants also complete a placement test before and after the course to measure the skills they've developed.

1 What is VHDL?

- Meaning of the acronym and characteristics of VHDL.
- Language history and fields of application.
- Application fields and system description.
- Advantages/disadvantages of the language.
- Other HDL languages.
- VHDL/Verilog comparison.

2 VHDL in the design flow

- Circuit design steps.
- A common language: VHDL.
- Functional simulation.
- From language to circuit: synthesis.
- Multi-probe portability.
- From circuit to language: retroannotation.

3 Hierarchy and functionality

- Two complementary visions.
- Example of the hierarchical construction of an adder.

4 Language basics

- Structure of a VHDL file.
- Concurrent instructions.
- Sequential instructions.
- Memento: example of combinatorial and sequential coding.
- Sub-programs: functions and procedures.
- Common errors and test bench structure.

Hands-on work

Use of the 4-bit adder element (7-segment decoder, 1-digit BCD counter, display rotation, 4-display management).

5 How do I describe the circuit?

- Design unit: entity, architecture.
- The 3 levels of description (behavioral, data flow, structural).
- Combinatorial and sequential operators.
- Type conversions.
- Describe synchronous state machines.
- Describe architectures and structure circuits.

Hands-on work

Coding and simulation: 4-bit adder, 7-segment decoder, 1-digit BCD counter, display rotation, 4-display management.

6 How do you test its operation?

- Test bench structure.
- Unit testing and global testing.

Hands-on work

Application coding and simulation.

TEACHING AIDS AND TECHNICAL RESOURCES

• The main teaching aids and instructional methods used in the training are audiovisual aids, documentation and course material, hands-on application exercises and corrected exercises for practical training courses, case studies and coverage of real cases for training seminars.
• At the end of each course or seminar, ORSYS provides participants with a course evaluation questionnaire that is analysed by our instructional teams.
• A check-in sheet for each half-day of attendance is provided at the end of the training, along with a course completion certificate if the trainee attended the entire session.

TERMS AND DEADLINES

Registration must be completed 24 hours before the start of the training.

ACCESSIBILITY FOR PEOPLE WITH DISABILITIES

Do you need special accessibility accommodations? Contact Mrs. Fosse, Disability Manager, at psh-accueil@orsys.fr to review your request and its feasibility.

7 Devaluation card test

- Presentation of the evaluation card.
- Routing placement and test on evaluation board.

Hands-on work
Evaluation card test.

8 Language complement

- Class types (scalar and structured types, composite types).
- Attributes.

Dates and locations

PARIS LA DÉFENSE
2026 : 17 Mar., 23 June, 29 Sep., 17 Nov.