

# **Introduction to FPGA Programming**

## **Report of Contributions**

Contribution ID: 1

Type: **not specified**

## **Lesson 1: Digital Systems, FPGAs and HDL**

*Monday, September 2, 2024 9:00 AM (45 minutes)*

**Presenter:** CIERI, Davide (Max-Planck-Institut für Physik)

Contribution ID: 2

Type: **not specified**

## **Lab 1: First Look at Vivado**

*Monday, September 2, 2024 9:45 AM (20 minutes)*

Contribution ID: 3

Type: **not specified**

## **Lab 2: Simulating an HDL design with Vivado and GHDL**

*Monday, September 2, 2024 10:05 AM (55 minutes)*

Contribution ID: 4

Type: **not specified**

## Lesson 2: VHDL Fundamentals

*Monday, September 2, 2024 11:30 AM (30 minutes)*

**Presenter:** CIERI, Davide (Max-Planck-Institut für Physik)

Contribution ID: 5

Type: **not specified**

## Lab 3: Wiring Switches to LEDs

*Monday, September 2, 2024 12:00 PM (30 minutes)*

Contribution ID: 6

Type: **not specified**

## **Lesson 3: Boolean Algebra, Look-up Tables and IOs**

*Tuesday, September 3, 2024 9:00 AM (30 minutes)*

**Presenter:** CIERI, Davide (Max-Planck-Institut für Physik)

Contribution ID: 7

Type: **not specified**

## **Lab 4: Wiring Switches to LED (part II)**

*Tuesday, September 3, 2024 9:30 AM (30 minutes)*

Contribution ID: 8

Type: **not specified**

## Lab 5: Implement a Full Adder

*Tuesday, September 3, 2024 10:00 AM (20 minutes)*

Contribution ID: 9

Type: **not specified**

## Lab 6: Hierarchical Design

*Tuesday, September 3, 2024 10:20 AM (40 minutes)*

Contribution ID: **10**

Type: **not specified**

## **Lesson 4: Sequential Logic and Flip-Flops**

*Tuesday, September 3, 2024 11:30 AM (30 minutes)*

Contribution ID: 11

Type: **not specified**

## Lab 7: Counters and Debouncing

*Tuesday, September 3, 2024 12:00 PM (30 minutes)*

Contribution ID: 12

Type: **not specified**

## Lab 8: An LED Blinker

*Tuesday, September 3, 2024 12:30 PM (30 minutes)*

Contribution ID: 13

Type: **not specified**

## Lesson 5: Types, Arrays and Arithmetic Functions

*Wednesday, September 4, 2024 9:00 AM (30 minutes)*

**Presenter:** CIERI, Davide (Max-Planck-Institut für Physik)

Contribution ID: 14

Type: **not specified**

## **Lab 9: Design an Arithmetic Logic Unit**

*Wednesday, September 4, 2024 9:30 AM (1 hour)*

Contribution ID: 15

Type: **not specified**

## Lesson 6: VHDL Simulation

*Wednesday, September 4, 2024 11:00 AM (40 minutes)*

Contribution ID: 16

Type: **not specified**

## Lab 10: Testbench Coding

*Wednesday, September 4, 2024 11:40 AM (1 hour)*

Contribution ID: 17

Type: **not specified**

## Lesson 7: Storing Data on FPGAs

*Thursday, September 5, 2024 9:00 AM (30 minutes)*

Contribution ID: **18**

Type: **not specified**

## **Lab 11: Trigonometric Functions on FPGA**

*Thursday, September 5, 2024 9:30 AM (1 hour)*

Contribution ID: 19

Type: **not specified**

## **Lesson 8: Packages, Libraries and Parametrisation**

*Thursday, September 5, 2024 11:00 AM (30 minutes)*

Contribution ID: 20

Type: **not specified**

## Lab 12: Packages and libraries

*Thursday, September 5, 2024 11:30 AM (30 minutes)*

Contribution ID: 21

Type: **not specified**

## **Lab 13: Parameters and Parametised Generation**

*Thursday, September 5, 2024 12:00 PM (30 minutes)*

Contribution ID: 22

Type: **not specified**

## Lesson 9: Finite State Machines

*Friday, September 6, 2024 9:00 AM (30 minutes)*

**Presenter:** CIERI, Davide (Max-Planck-Institut für Physik)

Contribution ID: 23

Type: **not specified**

## **Lab 14: Improve the Traffic Light**

*Friday, September 6, 2024 9:30 AM (30 minutes)*

Contribution ID: 24

Type: **not specified**

## Lesson 10: IP Blocks

*Monday, September 9, 2024 9:00 AM (30 minutes)*

Contribution ID: 25

Type: **not specified**

## Lab 16: Using IPs

*Monday, September 9, 2024 9:30 AM (30 minutes)*

Contribution ID: 26

Type: **not specified**

## **Lesson 11: Timing on FPGAs**

*Monday, September 9, 2024 10:00 AM (45 minutes)*

Contribution ID: 27

Type: **not specified**

## Lab 17: Timing Constraints

*Monday, September 9, 2024 11:15 AM (30 minutes)*

Contribution ID: 28

Type: **not specified**

## Lab 18: Generating Clocks

*Monday, September 9, 2024 11:45 AM (45 minutes)*

Contribution ID: 29

Type: **not specified**

## Lesson 13: External Interfaces

*Wednesday, September 11, 2024 9:00 AM (30 minutes)*

Contribution ID: **30**

Type: **not specified**

## **Lab 20: UART Transmitter**

*Wednesday, September 11, 2024 9:30 AM (1 hour)*

Contribution ID: **31**

Type: **not specified**

## **Lesson 9a: The 7-segment Display**

*Friday, September 6, 2024 10:00 AM (20 minutes)*

Contribution ID: 32

Type: **not specified**

## Lab 15: Design a Stopwatch

*Friday, September 6, 2024 10:50 AM (2 hours)*

Contribution ID: 33

Type: **not specified**

## Lesson 12: Hardware Debugging

*Tuesday, September 10, 2024 9:00 AM (30 minutes)*

Contribution ID: 34

Type: **not specified**

## Lab 19: Hardware Debugging

*Tuesday, September 10, 2024 9:30 AM (1 hour)*

Contribution ID: 35

Type: **not specified**

## **Lab 21. Connect to the VGA Display**

*Wednesday, September 11, 2024 11:30 AM (1 hour)*

Contribution ID: **36**

Type: **not specified**

## **Lesson 14: Advanced Vivado Flow**

*Tuesday, September 10, 2024 11:00 AM (30 minutes)*

Contribution ID: 37

Type: **not specified**

## Lab 22: Advanced Vivado Flow

*Tuesday, September 10, 2024 11:30 AM (1 hour)*

Contribution ID: **38**

Type: **not specified**

## **Lesson 15: Design Management with Vivado**

Contribution ID: 39

Type: **not specified**

## **Lab 23: Design Management**

Contribution ID: 40

Type: **not specified**

## Lesson 15: Processors on FPGA

*Thursday, September 12, 2024 9:00 AM (30 minutes)*

Contribution ID: 41

Type: **not specified**

## **Lab 23: Implementing a Microblaze soft processor**

*Thursday, September 12, 2024 9:30 AM (1 hour)*

Contribution ID: 42

Type: **not specified**

## **Lesson 16: Advanced FPGA topics**

*Thursday, September 12, 2024 11:00 AM (1 hour)*

Contribution ID: 43

Type: **not specified**

## **Lesson 13a: VGA Screens**

*Wednesday, September 11, 2024 11:00 AM (30 minutes)*

Contribution ID: 44

Type: **not specified**

## Course Examination

*Friday, September 13, 2024 9:00 AM (2 hours)*