Essentials of Microprocessors

Embedded 1

EMBD11000-ILT (v1.0)

Course Specification

Course Description

Learn what makes microprocessors tick! This class offers insights into all major aspects of microprocessors, from registers through coprocessors and everything in between. Differences between RISC and CISC architectures are explored as well as the concept of interrupts. A generic microprocessor is programmed and run in simulation to reinforce the principles learned in the lecture modules. The student will leave the class well prepared for the Xilinx Zynq™ All Programmable SoC training curriculum.

Level – Embedded 1

Course Duration – 1 day

Price – $700/day or 7 Xilinx Training Credits

Course Part Number – EMBD11000-ILT

Who Should Attend? – Novices to microprocessors or those who just need a refresher on microprocessor architecture.

Prerequisites

- None

Software Tools

- Microprocessor simulator provided with the lab materials

Hardware

- Architecture: N/A*
- Demo board: None*

* This course does not focus on any particular architecture. Check with North Pole Engineering, Inc., for specifics or other customizations.

After completing this comprehensive training, you will have the necessary skills to:

- Describe the key components of a generic microprocessor
- List common peripherals used with a microprocessor
- Write a simple assembly language program
- Describe the process of converting assembly language program into usable code

Course Outline

- Overview of a Generic Microprocessor
- Exercise 1 – Generic Microprocessor Block Diagram
- Generic Assembly Language
- Exercise 2 – Playing Computer
- **Lab 1:** Programming the Generic Microprocessor
- Generic Interrupts
- **Lab 2:** Write an Interrupt-Driven Program
- Interfacing with Memory
- Advanced Microprocessor Features
- Processor Architecture Comparison

Lab Descriptions

- **Lab 1:** Programming the Generic Microprocessor - Explore how to control a basic microprocessor and move data to and from memory by using assembly language.
- **Lab 2:** Write an Interrupt-Driven Program – Examine the benefits of coding by using interrupts to detect external activities. Special interrupt instructions are covered, including enabling and disabling interrupts, writing interrupt handlers, and how the stack and registers are affected during an interrupt.

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