

## 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 live instructor led training (in person or online)

**Price** – \$800 or 8 Xilinx Training Credits

**Course Part Number** – EMBD-uPS

**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 [Morgan Advanced Programmable Systems, Inc.](http://morgan-aps.com) for the specifics of the in-class lab board or other customizations.

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

- Describe the key components of a processor
- Write a simple assembly language program
- Explain how processors handle interrupts
- Describe some modern processor features
- Compare some existing processor architectures

## Course Outline

- Processor Architecture Overview
- Exercise 1 – Processor Components
- Introduction to Assembly Language
- Exercise 2 – Playing Computer
- **Lab 1:** Programming a Microprocessor
- Interrupts
- **Lab 2:** Writing an Interrupt-Driven Program
- Interfacing with Memory
- Advanced Processor Features
- Processor Architecture Comparison

## Lab Descriptions

- **Lab 1:** Programming a Microprocessor - Explore how to control a basic microprocessor and move data to and from memory by using assembly language.
- **Lab 2:** Writing 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.

## Register Today

Morgan Advanced Programmable Systems, Inc. (Morgan A.P.S.) delivers public and private courses in locations throughout the central US region; including Iowa, Illinois, Kansas, Minnesota, Missouri, Nebraska, North Dakota, South Dakota, and Wisconsin.

Visit [morgan-aps.com/training](http://morgan-aps.com/training), for full course schedule and training information.



You must have your tuition payment information available when you enroll. We accept credit cards (Visa, MasterCard, or American Express) as well as purchase orders and Xilinx training credits.

## Student Cancellation Policy

- Student cancellations received more than 7 days before the first day of class are entitled to a 100% refund. Refunds will be processed within 14 days.
- Student cancellations received less than 7 days before the first day of class are entitled to a 100% credit toward a future class.
- Student cancellations must be sent [here](#).

## Morgan A.P.S. Course Cancellation Policy

- We regret from time-to-time classes will need to be rescheduled or cancelled.
- In the event of cancellation, live on-line training may be offered as a substitute.
- Morgan A.P.S. may cancel a class up to 7 days before the scheduled start date of the class; all students will be entitled to a 100% refund.
- Under no circumstances is Morgan A.P.S. responsible or liable for travel, lodging or other incidental costs. Please be aware of this cancellation policy when making your arrangements.
- For additional information or to schedule a private class contact us [here](#).

## Online training with real hardware

During the Covid-19 period, some companies do not allow their staff to participate in live in-person training.

- Consequently, Morgan Advanced Programmable Systems, Inc. has set up a training VPN where engineer participants can take classes online using the same computers and devCards used during in-person training.
- Even better, and upon request, you can use these computers after hours on training days to experiment with labs. This is not possible for in-person training.
- Additionally, just like in-person training, the laptops and devCards, tools, OS, and licensing are set up in advance.
- In some ways, live online-training is better than in-person...for example, you can grant the instructor permission to look at your Vivado, PetaLinux terminal, or Vitis for extended periods of time if your lab is not going exactly as planned to a missed step.
- This is often more comfortable than two engineers crowding around a laptop screen.
- Taking remote training also allows you to learn some tips and tricks for working remote. Whether your devCard is in the lab down the hall, or across the world via VPN, you can control your Xilinx based device quickly and efficiently.