**Embedded Linux Development on Zynq using Vivado Workshop**

**ZedBoard**

**COURSE DESCRIPTION**

This course provides university academics with the resources, high-level skills, and confidence to introduce Embedded Linux development on Zynq using Vivado to their teaching and research programs.

# Install Xilinx software

Professors may submit the online donation request form at <http://www.xilinx.com/member/xup/donation/request.htm> to obtain the latest Xilinx software. The workshop was tested on a PC booted using the LiveUSB running **Ubuntu 12.04 Desktop i386**.

* Vivado 2013.3 + SDK System Edition
* PetaLinux Tools 2013.10
* Follow the LiveUSB Creation Step guide available at http:// [www.xilinx.com/support/university/vivado/vivado-workshops/Vivado-embedded-linux-zynq.html](http://www.xilinx.com/support/university/vivado/vivado-workshops/Vivado-embedded-linux-zynq.html)

1. **Setup hardware**

Connect ZedBoard

* 1. Connect programming cable between configuration port of ZedBoard and PC
  2. Connect another micro USB cable between ZedBoard’s UART port and PC USB port
  3. Connect the power supply and power on the board

1. **Install distribution**

Download and extract the *labsource.zip* file in /home/petalinux directory. This will generate the **sources** and **labs** folders. Download and extract the labdocs.zip file consists of lab documents in the PDF format. Extract this zip file in /home/petalinux directory or any directory of your choice.

1. **For Professors only**

Download the labsolution.zip and docs\_source.zip files using your membership account. Do not distribute them to students or post them on a web site. The docs\_source.zip file contains lab documents in Microsoft Word and presentations in PowerPoint format for you to use in your classroom.

1. **Get Started**

Review the presentation slides (see course agenda) and step through the lab exercises (see lab descriptions) to complete the labs.

# COURSE AGENDA

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| **Day 1 Agenda** | **Day 1 Materials** |
| Class Intro | 01\_class\_intro.pptx | |
| Embedded Linux Overview | 02\_Embedded\_Linux\_Overview.ppt x | |
| Lab 1: A First Look | 02a\_lab1\_intro.pptx  lab1.docx | |
| Introduction to PetaLinux Tools | 03\_Intro\_PetaLinux\_Tools.pptx | |
| Lab 2: Build and Boot Linux | 03a\_lab2\_intro.pptx  lab2.docx | |
| Application Development | 04\_App\_Development.pptx | |
| Lab 3: Application Development and Debug | 04a\_lab3\_intro.pptx  lab3.docx | |
| File Transfer, TCPIP, Networking | 05\_TCPIP\_Networking | |
| Lab 4: Networking | 05a\_lab4\_intro.pptx  lab4.docx | |
| Device Drivers and Loadable Modules | 06\_ Device\_Drivers\_Loadable\_Modules.pptx | |
| Lab 5: Drivers and Modules | 06a\_lab5\_intro.pptx  lab5.docx | |
| **Day 2 Agenda** | **Day 2 Materials** | |
| Introduction to Vivado, SDK, and Zynq | 07\_Board\_Bring\_Up.pptx | |
| Lab 6: Basic Hardware Design using Vivado and PetaLinux Tools | 07a\_lab6\_intro.pptx  lab6.docx | |
| Custom Hardware Development | 08\_Custom\_Hardware\_Development.pptx | |
| Lab 7: Custom Hardware Development | 08a\_lab7\_into.pptx  lab7.docx | |
| Custom Driver Development | 09\_ Custom\_Driver\_Development.pptx | |
| Lab 8: Device Drivers | 09a\_lab8\_into.pptx  lab8.docx | |

**LAB** **DESCRIPTIONS**

Lab 1 - Compare and contrast embedded Linux on Xilinx Zynq SoC and Linux on desktop.

Lab 2 - Build your own kernel image and boot new image via the network.

Lab 3 - Create an application and debug using cross-debugger.

Lab 4 - File transfer, Network File System (NFS) mount, and embedded web-server and web-based applications.

Lab 5 - Create a simple run-time loadable kernel module.

Lab 6 - Create a Linux capable SoC platform from scratch including hardware and kernel.

Lab 7 - Use custom PWM core with AXI interface.

Lab 8 - Develop UIO drivers for the custom PWM core and an application to test them.

1. **Contact XUP**

Send an email to [xup@xilinx.com](mailto:xup@xilinx.com) for questions or comments