

PG Program in Embedded and SoC Design

24 Weeks / 840 Hrs. (7 Hrs. per day)

Medium of Instruction: English

Objective

To develop the skill set required for the Design and Development the Embedded System Applications using suitable Hardware and Software tools and its implementation on the target FPGA platform. The qualifiers will acquire hands-on experience in embedded system design, state-of-the-art design methodologies and platforms. The program is an immediate relevance to industry and makes the participants exactly suitable for Embedded and VLSI Industry

B.E/B. Tech in Electronics/ Electronics & Communication/ Electrical/ Electrical And Electronics/Instrumentation/ Electronics & Instrumentation / Instrumentation & Control /Biomedical /Computer Science /Information Technology /M.Sc. (Electronics)/AMIE in Electronics/ Electronics & Communication.

Eligibility

Prerequisite

- ✓ Candidate must have latest computer/laptop with preferably 4 GB RAM or higher and Graphics Card (2 GB)
- ✓ Internet connection with good speed (preferably 2Mbps or higher)

Rs.52,000/- (Including GST)

Course Fees

Certificate

Certificate will be issued to the participants based on the marks scored in the examination conducted after the completion of training.

- ✓ Teaching Mode: Online
- ✓ Instructor-led live sessions
- ✓ Online/ Blended lab sessions
- ✓ Content access through LMS
- ✓ Recorded Session Available

Methodology

Outcome

After successful completion of this course, students will be able to:

- ✓ Develop Embedded Application using ARM Cortex Microcontroller with Embedded- C Programming.
- ✓ Able to implement the Image Processing algorithms using MATLAB.
- ✓ Design and Develop IPs for VLSI using Verilog HDL and prototype them on FPGAs.
- ✓ Create their own IP and SoC design for FPGA implementation
- ✓ Develop their own software application with Zynq APSoC

Course Content

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Module-1: VLSI Fundamentals

- ✓ Introduction to VLSI
- ✓ Combinational and Sequential Circuit Design, Design of controller and Data path units, State Machines

Module-2: Embedded C and ARM Cortex Microcontroller

- ✓ Embedded Concepts
- ✓ C' and Embedded-C
- ✓ ARM Cortex M4 Microcontrollers & Peripherals

Module-3: Embedded Linux

- ✓ Architecture of Embedded Linux
- ✓ Commands in Linux and Configuring the Linux Environment
- ✓ Embedded Linux Kernel and Building Root File System
- ✓ Porting OS in ARM Board and Embedded Linux Application Programming

Module-4: Image Processing with MATLAB

- ✓ Introduction to Image Processing, Image Transform, Image Enhancement,
- ✓ Typical image processing application implementation using MATLAB

Module-5: Verilog HDL: Language and Coding for Synthesis

- ✓ Introduction to Verilog HDL & Hierarchical Modeling Concepts
- ✓ RTL Design and Logic Synthesis and Synthesis issues

Module-6: FPGA-Based Digital System Design Module

- ✓ Architecture of popular Xilinx FPGAs
- ✓ STA and AXI4/Avalon Interfaces
- ✓

Module-7: Embedded SoC Design on FPGA

- ✓ Implementation of architectures for Image Processing/ML algorithms using Xilinx Vitis
- ✓ Performance comparison with DSPs and Multi-core SoCs.

Module-8: IoT Basics

- ✓ IoT Overview, IoT- Architecture, Node, Gateway, Cloud & Protocols

Faculty

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