NIST Center of Excellence
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NIST Center of Excellence
Offers a Range of Employment Oriented Industrial Courses

Course Highlights:
- 100 hours Program
- 4 hours a day-3 days a week
- Flexible unlimited Lab timings
- Library resources available
- Mini projects
- B.Tech. Project mentoring

NIST Technology Consulting Services
Electronic Design Automation Software Tools for VLSI/ASIC Design

Course Goals
To introduce the latest VLSI Design Technologies and software used in the Electronics/Semiconductor industry. The software and hardware packages which will be introduced in this course are:
- Xilinx ISE 14.1 for FPGA digital design, DSP design and implementation, Electrical and Instrumentation applications using Spartan/Virtex.
- Embedded system application using Xilinx EDK, VIVADO and Spartan/Virtex, Z-board
- Active HDL for VHDL/Verilog digital design and simulation.
- Tanner tool for IC design.
- Spice for Circuit Simulation.
- Introduction to Cadence tool for IC Design.
- Process Tool for silicon using Silvaco.

Course Contents
- Overview of VLSI/ASIC design and methodology.
- Course on VHDL/Verilog, Spice.
- Architectural overview of FPGA and CPLDs.
- MOS and CMOS device physics.
- IC design and fabrication process (Full Custom and Semi-Custom)
- Cell Library Design.
- Analog/Mixed signal design methodology.
- Testing/Mixed signal design methodology.
- Testing and Verification issues of VLSI Design.

Course Fees:
- For Students: Rs. 8,000/-
- For Industry sponsored candidates: Rs. 10,000/-

Prerequisites
Students are expected to know the fundamentals of analog and digital circuits.
Students should have completed at least 4th Semester of BPUT.
NB: The course has four modules on PSpice, Verilog/VHDL, Xilinx, and Tanner. The students can do the course on individual model also.

Course Highlights
- World class curriculum - enables graduates to be "industry-ready"
- Leverage best-in-class Cadence technologies and access to ecosystem partners
- Provides an incremental training approach leading up from VLSI basics to industry-relevant skills
- More than 200 hours of Theory + Labs + Tool Training
- Course can run on weekend also

Course Details
General Courses: Introduction to the Linux Operating systems, Scripting, Editing
Digital Courses: Theory + Labs + Tool Training
- Implement, practical digital functional blocks using the Verilog language
- Coding HDL, Modeling HDL, RTL and gate level verification/simulation, creating timing constraints and running RTL synthesis, testing and Design for Testability (DFT), and top-down design methodology

Analog Courses: Theory + Labs + Tool Training
- Introduction to practical working knowledge of the fundamental design and techniques
- Create and edit schematics for use with the suite of Cadence simulation and layout tools
- Verilog in and Spice in translators to generate netlists and symbols
- Place instances, wire schematics, use hierarchical design, run netlist creation and simulation, add rules using the Constraint Editor, create inherited connections, and generate layout instances from the schematic

Soft Skills Training: Interview, Communication, Presentation and Team Interaction skills
NB: Students will be trained to participate in Cadence Design Contest and there is a chance to win prize worth of Rs.1.5 Lakhs

Course Fees:
- For Students: Rs. 12,000/-
- For Industry sponsored candidates: Rs. 20,000/-
Embedded System

Course Goals
To introduce the latest Embedded Technologies and software. The students will be introduced to ARM based applications, real time operating system, VxWorks, Android Programming etc.

Course Contents
- ARM Based Application Development : ARM Processor Basics, Programmer’s Model, ARM Instruction Set, Thumb Instructions, Programming ARM with C
- Tornado and VxWorks: Tornado, Cross Development, Tornado host IDE, CrossWind Debugger, Debugger Tool Bars, Starting and stopping a debugger, WindView Software Logic Analyzer, Tornado Target Server, VxWorks: A partner in the Real-time Development Cycle, VxWorks facilities, Multiple Tasks, Inter task Communication (semaphore, Message Queues, pipes), Network Intertask communication, POSIX Shared Memory

Prerequisites
6th Semester and above Students having basic knowledge of microprocessor and programming concepts

Course Fees :
For Students: Rs. 8,000/-
For Industry sponsored candidates: Rs. 10,000/-

Graphical System Design using LabVIEW

Course Goals
This course will mainly introduce the students to write algorithms, logic programs and create complex applications in different fields of engineering like Industrial control, mechatronics, Advanced Communication system, Digital and image processing and other advanced fields and use various associated hardware to gain a hands on experience of acquiring complex industrial data and create efficient algorithms using graphical programming language and gain real time practical experience.

Highlights of some of the real time application tools used in this training are as follows:
- USB Daq 6009, C-Daq, My Daq with interfacing
- Compact-Rio based on FPGA Processor
- Analog and Digital circuit design and simulation using Elvis and Elvis-sim
- Online image acquisition and processing using NI vision module
- Motion control using NI Robotic vehicle
- ARM based SV Rio

Course Contents
- Introduction to Labview
- Advanced Labview environment
- Design style using Modular programming
- Loops and structure
- Arrays and clusters
- Graphs and chart
- strings and files
- Elvis programming and related Hardware
- Robotic Module Programming
- Vision module programming and interfacing

Course Fees :
For Students: Rs. 8,000/-
For Industry sponsored candidates: Rs. 10,000/-

Prerequisites
Student should complete 4th semester preferably from EIE, EEE, ECE discipline
NB: The course will lead to NI Labview certification program
**Course Goals**

Creo is a fully parametric CAD program. This means that the geometry of features (e.g., holes, slots) on a part have to be fully specified in terms of size, shape, orientation, and location. This specification allows the user to write equations (i.e., relations) which describe how features on individual parts or multiple parts should relate to each other. In this course along with the CAD designing student will also learn how to interface this with CNC for Manufacturing. The focus areas are as follows:

**Course Contents**
- **Introduction to Creo:** What is Parametric modeling, Working with or without Intent manager, Different File extensions in Pro-E, Setting up working directory, Current session files, Pro-E options.
- **Sketcher:** Working with and without intent manager, Sketch dimensioning, Auto dimensioning, modify, Geometric tools, Constraining, regenerate drawings, sketch view.
- **Part Modeling:** Feature creation, Potrusion & cut( Extrude, Revolve, Sweep, Blend, Blend Vertex, Use quilt) Solid, Thin, Rib, Shell, Pipe, Tweak base feature like draft, offset, flatten quilt etc., Hole Dress up feature fillet, chamfer.
- **Surface Design:** Datum curves, Datum point, Datum plane, Datum Co-ordinate system, Sketch base features, Extrude, Revolve, Sweep, Blend, Flat, Offset, Copy, Copy by trim, Advance surface creation, New, Merge, Trim, Extend, Transform, Draft, Area offset, Draft offset, Use quilt( conversion of surface to solids )
- **Drafting:** Introduction to drafting, With /without templates, formats, placing views, Placing dimension, Calling up Different model, Tolerances, Notes, Bill of materials etc.

**Prerequisites**

Some prior exposure to Basic Engineering Drawing and working knowledge of computers is desired.

**Course Fees :**
- For Students: Rs. 8,000/-
- For Industry sponsored candidates: Rs. 10,000/-