

## 1-day Hands-on Workshop on **Digital Design/ Prototyping with Verilog** (Introduction to Digital Design through HDL)

<b>LEARN</b>	Introduction to Digital Design/ Prototyping using Verilog, a industry standard hardware description language using Open Source Tools. Hands-on sessions.
<b>FOR WHOM</b>	<ul style="list-style-type: none"> <li>• Aspiring Entrepreneurs in Digital design</li> <li>• Digital Design learning aspirants with background in Digital Circuits Theory and Boolean Logic.</li> <li>• Electronic / Robotics hobbyists who aspire to design using FPGA's</li> <li>• PG students/ Final year UG students in electronics/ instrumentation engg</li> </ul>
<b>WHEN</b>	Thursday, 28 April 2011 9AM - 6PM
<b>WHERE</b>	E-Class Room, Venture Center (Entrepreneurship Development Centre) 100, NCL Innovation Park, National Chemical Laboratory Campus Dr Homi Bhabha Road/ Pashan Road, Pune -411008
<b>CONTACT</b>	Administrative queries: Ms. Namrata Salwe Phone: 91-20-2590-2984; Email: <a href="mailto:software@venturecenter.co.in">software@venturecenter.co.in</a>  Technical queries: Mr S Basu; Phone: +91-9260462088  For more information, visit: <a href="http://www.venturecenter.co.in/workshops/">http://www.venturecenter.co.in/workshops/</a>
<b>FEE</b>	Rs 1000 per person. <b>Limited seats. First-come-first-serve</b>  <b>Discounts:</b> 25% discount if you bring your own laptop Further, 25% discount for students against valid ID cards

## Workshop description

Hardware Description Languages ( HDL's ) are the industry standard method of designing digital circuits , from LSI to VLSI. Out of the main contenders , Verilog has a large share among digital designers mostly because of its very simple syntax yet being very close to hardware. The Workshop aims to teach digital design principles using Verilog to people acquainted with digital logic basics. The Workshop focuses on :

- **Hardware Design Life Cycle:** The workflow of a modern design is a complex process involving people with various skillsets and layered design structure with a multitude of tools interfacing between the layers. We take a top level view of this flow to understand the challenges.
- **The Role of HDL:** With many current day designs crossing billion transistors , HDL's are the life force behind digital designs keeping designs modularized for easy human understanding and yet connectable and instantiable to produce elaborate designs.
- **Tools Required:** Design Tools by intent are extremely expensive impairing the hands-on learning experience of an aspirant. We take a look at open source tools for learning hands-on and understand their limitations.
- **HDL Tutorial:** We take a look into the Verilog Syntax with real life examples. This is the main focus of the workshop.
- **Hands on Design and Simulation:** Our Workshop also includes hands-on design and simulation lab time discussing tips and tricks about design , the tools and in general how to find out whether your design works?
- **Licensed Tools:** For people who intend to make working prototypes , we include introduction to the various tools present in the market and their estimated costs.

## Synopsis

- Learn Digital Design Life-Cycle
- Learn Verilog Syntax and Open Source Tools
- Practice by designing real life components

## Target audience

- Aspiring Entrepreneurs in Digital IP Design
- CSE/EE/ECE students in their senior years or PG students
- Hobbyists/Robotics Fanatics
- (Note: Participants need to have studied or taken basic courses in digital logic before)

## Faculty

The workshop shall be taught by Mr **S. Basu**.

**Profile :** Design Engineer with experience in both Digital and Analog Design. Experienced in a multitude of EDA and simulation tools. Strong interests in Embedded systems design and multicore code design. Hobby Robotics fan and entrepreneur in related field.

**Education :** B.Tech (H) '03 , M.Tech '04 (Indian Institute Of Technology , Kharagpur)

**Experience:** Component Design Engineer for Intel India's first Multicore project; Co-author of Enhanced Structural Tester Based Functional Test methodology for Intel Multicore processors; Mixed-Signal Design Consultant for National Semiconductor's Sponsored Project at IIT Kharagpur; Entrepreneur and Design Engineer

**Research and previous Workshops:** Behavioral Modelling for Mixed Signal Sytems using Verilog-AMS speeding up simulation times by 1000x; Analysis of spice simualtion engine for simulation speedup; Computer Architecture : Multi-core programming using Message Passing Interface and CUDA; Workshop on Behavioral Modelling at IIT Kharagpur

## Schedule

Timings	Topic	Duration	Comments
9:00 – 10:00	Introduction	60 mins	The What and Why of Digital Design
	Hardware Design Evolution		
	Current Trends		
	Digital Design – The Layered Approach		
	The Role of HDL		
	Tools and Design Stages		
10:00 – 10:30	Tea	30 mins	
10:30 – 13:00	HDL Basics : HDL is not a programming language	150 mins	Introduction to Verilog
	Module Creation		
	Testbench Creation		
	Simulating the first Design		
	Analyzing the results		
	Combinatorial Design		Type -1 Design
	Register Transfer Level Design		Type -2 Design
13:00 -14:00	Lunch	60 mins	
14:00 – 14:15	Team Formation	15 mins	
14:15 – 15:30	Tutorial : Combinatorial Logic	75 mins	Clearing basic concepts
	Tutorial : RTL		
	Tutorial : FSM Design		
15:30 -16:00	Tea	30 mins	
16:00 – 18:00	Tutorial : ALU Design	120 mins	Advanced design principles
	Tutorial : FIFO Design		
	Closure		
	Workshop Feedback		
	Goodies Handout		

## Workshop includes

- Classroom and practical sessions about digital designs and get practical insights.
- 150 page handout with useful, practical information
- Access to a restricted website with links to useful resources, software resources etc
- Joining a mailing list community of digital design enthusiasts
- Certificate of Participation from Venture Center
- Basic lunch and tea/coffee at Venture Center Cafeteria

## About the organizers

Venture Center strives to nucleate and nurture technology and knowledge-based enterprises by leveraging the scientific and engineering competencies of the institutions in the "Pune region" in India. The Venture Center is a technology business incubator specializing in technology startups offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences & engineering. The Venture Center is the trademark of Entrepreneurship Development Center, a not-for-profit company hosted by the National Chemical Laboratory, Pune, India. More information is available at: <http://www.venturecenter.co.in/>