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Tinkering Lab Technical Workshops Series – 2018

One Day Intensive Workshop on

## Printed Circuit Board

## Design & Make Your Own PCB

- Organized by Venture Center -

<b>Learn</b>	<ul style="list-style-type: none"> <li>• PCB Design &amp; Development</li> <li>• Steps and processes in PCB design</li> <li>• Hardware requirement analysis and Systems Engineering</li> <li>• PCB design software</li> <li>• PCB Manufacturing processes and PCB Assembly</li> <li>• Product Design and System Integration</li> </ul> <p><i>The workshop is intended to be basic</i></p>								
<b>Organized by</b>	<ul style="list-style-type: none"> <li>• Tinkering Lab at Venture Center</li> </ul>								
<b>For whom</b>	<ul style="list-style-type: none"> <li>• Industry professionals</li> <li>• Innovators &amp; Entrepreneurs</li> <li>• Students</li> </ul>								
<b>When</b>	<b>Saturday   13 January 2018   Time: 0900 – 1800</b>								
<b>Where</b>	E-class room, Venture Center, 100 NCL Innovation Park, Dr. Homi Bhabha Road, Pashan, Pune-411008								
<b>Contact</b>	Ms. Lipika Biswas   Phone: +91-20-25865877   Email: <a href="mailto:eventsdesk@venturecenter.co.in">eventsdesk@venturecenter.co.in</a>								
<b>Cost</b>	<p>Fees:</p> <table border="1"> <tr> <td>Large companies</td> <td>Rs 4000/-</td> </tr> <tr> <td>Micro, Small, Medium enterprises/ individuals</td> <td>Rs 3000/-</td> </tr> <tr> <td>Students with valid id card/ VC resident companies</td> <td>Rs. 2000/-</td> </tr> <tr> <td>VC staff / VC fellows</td> <td>Rs. 600/-</td> </tr> </table> <p>*Note: Fees once paid is not refundable under any circumstances</p> <p>20 seats; First come first serve</p> <p>Register online at: <a href="http://bit.ly/2oF5oOF">http://bit.ly/2oF5oOF</a>  More details on: <a href="http://tinkeringlab.co.in/events-2/">http://tinkeringlab.co.in/events-2/</a></p>	Large companies	Rs 4000/-	Micro, Small, Medium enterprises/ individuals	Rs 3000/-	Students with valid id card/ VC resident companies	Rs. 2000/-	VC staff / VC fellows	Rs. 600/-
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### Introduction

The workshop is aimed at making students, professionals aware of PCB design & Development. In this course, our experts will take you through the process of making Printed Circuit Boards. The workshop will focus on PCB designing followed by essentials of schematic and Layout design using software. This workshop combines insightful lectures with practical lab exercises to reinforce key concepts.

### Workshop Outline

The workshop will include the following:

Theory sessions:

- Overview of PCB Design & Development
  - Understanding the steps and process in designing of PCB
  - Brief outline of overall activities involved in PCB development
- Understanding PCB design from Systems engineering perspective and requirements analysis
  - How to Design, Placement, and routing- V model
  - Noise factor analysis, Simulations
- Introduction to PCB design software
  - Schematic design
  - Preparation of Board
  - Layout design
  - PCB Design to Gerber file generation
- Hands-on PCB Designing with Open source software (Eagle CAD)
  - Drawing sample schematic
  - Creating all files required for manufacturing
- PCB Manufacturing processes and PCB Assembly
  - PCB Fabrication – small scale to large scale
  - PCB Assembly – Prototype to High Volume
  - PCB Design For Manufacturing (DFM) – Need and Challenges
- PCB Design & Manufacturing Case Studies -
  - Case Studies in line with different types of PCBs
- Product Design / System Integration – Questions & Answers

Demonstration: PCB fabrication

Hands-on session: Hands-on with Drilling, placement, Good soldering practices & PCB Design software

Participants can design their own PCB using the software taught during the workshop within a period of one month from the workshop date and get it fabricated by us in our lab.

**Participants will have to bring their own laptops.**



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### Workshop includes

- Theory sessions, demonstrations and hands on lab sessions
- Kit (CD with open source PCB Design Software, Copper Clad, Sample Circuits, Power Supply ,Amplifier ,DC Motor Driver, Step Motor Driver, Ambient Light Sensors, Fire flame sensor ,UV Radiation sensor etc.)
- Access to restricted website with online compilation of resources
- Workshop includes Breakfast, tea/coffee and lunch at Venture Center Innovation Cafeteria
- Certificate of participation issued by Venture Center
- Membership in mailing list to other workshops by Venture Center

**\*Please note, the participants will have to arrange for their own travel/local transport and accommodation.**

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- For accommodation (standard and budgeted hotels) please visit: <http://www.venturecenter.co.in/puneguide/standard.php>
- For accommodation (deluxe and luxury hotels) please visit: <http://www.venturecenter.co.in/puneguide/deluxe.php>
- For local transport details visit:<http://www.venturecenter.co.in/puneguide/taxi.php>

### Workshop Schedule

Time (hrs)	Topic and Contents	Venue	Faculty
0830-0900	Breakfast and registration	Cafeteria	-
0900-0915	Welcome and background of Venture Center Introduction to Workshop	E-class room	Manisha Premnath
0915-1015	Overview of PCB Design & Development	E-class room	Girish Mujumdar
1015-1030	Tea/Coffee	Foyer area	-
1030-1200	Understanding PCB design context and systems engineering perspective	E-class room	Aniruddha Atre
1200-1330	Hands-on PCB Designing with Open source software(Eg.Eagle CAD)	E-class room	Satish Deshpande Anil Waghmode
1330-1400	Lunch	Cafeteria	-
1400-1530	PCB Manufacturing processes and PCB Assembly PCB Design & Manufacturing Case Studies	E-class room	Satish Deshpande
1530-1545	Tea/Coffee	Foyer area	-
1545-1645	Lab session: Demonstration of PCB machine	Prayashala	Satish Deshpande Sayali Kothmire
1645-1730	Product Design / System Integration – Questions & Answers	E-class room	Sanjay Ingale
1730-1800	Feedback and Valedictory	E-class room	V Premnath



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**Speakers (in alphabetical order of last names)**



Aniruddha Atre

Aniruddha Atre is an entrepreneur and the co-founder of Jeevtronics, a medical device startup incubated with Venture Center, working on the world's first hand cranked defibrillator, a cardiac emergency therapy device designed for developing countries globally. He brings 19 years of total industry experience 11 years of which is from the automotive industry in United States. His expertise spans product development, sourcing, product planning /program management and launch in high volume manufacturing plants in North America at Ford Motor Company. Aniruddha is passionate about social entrepreneurship and innovation and has worked from concept to commercialization of human powered generators and solar powered devices with very long life energy storage and power electronics and now into medical devices. Aniruddha holds Bachelors in Mechanical engineering from Pune University, Masters Degree in Mechanical engineering from Wayne State University, Detroit and MBA from Ross School of Business at the University of Michigan, Ann Arbor. During his MBA he was a student of legendary thinker Late Prof C.K.Prahalad who was his inspiration behind the journey in social entrepreneurship.



Satish Deshpande

Satish is Founder of Myriad Solutions. His Bachelors degree is in Engineering (Electronics).He has 26 years of Industrial Experience in Product Development and has specific design experience in Hardware (Analog, Digital, and Mixed-signal), Board, FPGA Systems, Mechatronics and Enclosures development. He is an embedded product design professional and is engaged in Product - Design, Development, and Support& Training. He has expertise in all aspects of embedded product design, He has work experience in Industrial Automation, Medical and Consumer Electronics domain.



Sanjay Ingale

Sanjay is Founder and CEO at BMek. He has more than 25 years of experience in the areas of IoT, Machine Learning, Big Data, Embedded Systems, Industrial Automation and Automotive Systems. He initiated, developed, led practices in the areas of Industrial Automation, Automotive Electronics, Semiconductor Equipment Manufacturing, MES Systems and Product Design Services. He managed more than 100 projects / programs with cross-functional teams. He has worked for Tata Motors, Satyam Computes, KPIT, Tata Elxsi.



Girish Mujumdar

Girish is the co-founder at Plezmo. Plezmo is an IoT start-up focusing on the education domain. He has over 18 years of technology products experience with top global companies in this industry.He started Plezmo in 2016 with intent to inspire children to build project infused with technology. Prior to that he was Director for Research and Innovation Programs at VMWare.



Sayali Kothmire

Sayali is Lab associate at Venture Center. She is B.E.(Instrumentation & Control Engineering) from University of Pune. She is responsible for the current facilities in Tinkering Lab. She operates all the instruments in lab, provides training, plans & executes setting up & maintenance work in Tinkering Lab also involved in creating, planning and organizing technical and scientific workshops & hands-on lab exercises with Tinkering lab instruments.



Premnath Venugopalan

Premnath is currently the Head- NCL Innovations, Head -Intellectual Property Group at NCL, Scientist-Polymer Science & Engineering Division at NCL and Director-Venture Center. He has helped found and be the first Director of Venture Center, CSIR-Tech (a technology commercialization company), Orthocrafts Innovations (degradable synthetic polymer based biomed products start-up) and BioMed Innovations (silk based biomaterials start-up). He holds a B.Tech. from the IIT-B and a Ph.D. from the MIT, USA. He has also been a Chevening Technology Enterprise Fellow with the Centre for Scientific Enterprises, London Business School and Cambridge University, UK. He brings with him considerable experience in technology development and commercialization (two successfully commercialized families of biomedical products), incubation and innovation management, working with start-up companies (in Cambridge-UK and India) and engaging with large corporations on research and consulting projects as project leader.



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## About the organizers



### About Tinkering Lab

The Tinkering Lab is a facility developed and managed by Venture Center, NCL Innovation Park, Pune, India. The main aim of the Tinkering Lab is to help inventors and entrepreneurs to build prototypes of their ideas and generally “tinker” around exploring new ideas. The focus is on electronics, instrumentation and optics besides related prototyping and design.

For more information, visit <http://tinkeringlab.co.in/>



### About Venture Center

Entrepreneurship Development Center (Venture Center) – a CSIR initiative – is a Section 60 company hosted by the National Chemical Laboratory, Pune. 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 supported by the Department of Science & Technology’s National Science & Technology Entrepreneurship Development Board (DST-NSTEDB). Venture Center focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences & engineering.

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