



Venture Center
100, NCL Innovation Park
Dr. Homi Bhabha Road, Pune –411008
Email: eventsdesk@venturecenter.co.in
Phone: +91-20250934

Educational Workshop Series

3-Days Robotics Workshop : Learn to build autonomous robots

LEARN	The basics of robotics , circuits and motors .How to solder, how to build a circuit on breadboard and finally how to build an autonomous robot
FOR WHOM	6th – 12th standard Kids with keen interest in electronics as hobby
WHEN	Batch 1 :- 27-29 December 2012 - 10AM – 4 PM Batch 2 :- 1-3 January 2012 - 10AM – 4 PM
WHERE	E-Class Room, 100, NCL Innovation Park, National Chemical Laboratory Campus Dr Homi Bhabha Road/ Pashan Road, Pune -411008
CONTACT	Administrative queries: Miss Lipika Biswas 100 NCL Innovation park, Dr. Homi Bhabha road, Pashan, Pune- 411008 Phone no- 20250934 / 25865877 Email:- eventsdesk@venturecenter.co.in For more information, visit: http://www.venturecenter.co.in/workshops/
FEE	Rs 3000/- per participant Limited seats – 25



Venture Center
100, NCL Innovation Park
Dr. Homi Bhabha Road, Pune –411008
Email: eventsdesk@venturecenter.co.in
Phone: +91-20250934

Workshop description and Synopsis

Robotics is a multi-disciplinary subject with roots in electronics , computer science and mechanics. Although it is not taught in schools , a lot of kids still pursue it as a hobby while struggling to find out why something works or does not work. In this workshop we teach kids how to read a circuit diagram how to identify different electronic components and how to put together components to build a circuit. Since we aim to learn by examples , we build different components of an autonomous robot and put them together to watch it come alive.

Line-following robots are very popular robots which can track black lines drawn on the floor (or on paper) accurately without any user input, hence autonomous. We aim to build such Line-following robots and have a competition among kids to see whose robot completes the task the earliest.

- Learn the basics of passive circuit elements with the help of experiments
 - Resistor
 - Capacitor
 - Inductor
- Learn to identify active circuit components
 - Diode
 - Transistor
 - Integrated Circuit
- Learn the symbols and how to read a circuit diagram
- Learn how to use a Multimeter
- Learn How to make a circuit on breadboard
- Learn how to make a circuit on PCB (By Soldering)
- Make a :
 - IR emitter
 - IR Sensor
 - Microprocessor Interface
 - Motor Drive
- Learn by experiments why a DC motor rotates

Put it all together to build an awesome Autonomous Robot



Venture Center
 100, NCL Innovation Park
 Dr. Homi Bhabha Road, Pune –411008
 Email: eventsdesk@venturecenter.co.in
 Phone: +91-20250934

Target audience

- 6th – 12th Standard Students in Science
- The workshop assumes students have keen interest in electronics

Schedule

Timings	Topic	Duration	Comments
Day 1 :			
10:00 - 11:00	Passive Circuit Experiments	60 mins	Introduction to Electronics
11:00 - 11:15	Learn the symbols	15 mins	
11:15 - 13:00	Break	15 mins	
	Identify the components	105 mins	Semiconductors
	Learn the symbols		
	What is a multimeter		
	What is a Breadboard and PCB		
13:00 -13.30	Lunch	30 mins	
13.30 – 14.30	What is Infra-Red	60 mins	Circuit Making
14:30 -14:45	Break	15 mins	
14:45 – 16:00	What is an Infra-red Sensor	75 mins	
Timings	Topic	Duration	Comments
Day 2 :			
10:00 – 11:00	Making a Line Sensor	60 mins	
11:00 - 11:15	Break	15 mins	
11:15 - 13:00	What is a Motor	105 mins	Motor Basics
	Experiments with DC motor		
	Build a Dual Motor Drive		
13:00 -13:30	Lunch	30 mins	
13:30 - 14:30	What is a microprocessor	105 mins	Circuit Making
14:30 -14:45	Break	15 mins	
14:45 – 16:00	Completing the PCB	120 mins	Soldering Time
Timings	Topic	Duration	Comments
Day 3 :			
10:00 – 11:00	Make your Robot	60 mins	Robot Building
11:00 - 11:15	Break	15 mins	
11:15 - 13:00	Line Following Competetion with Robots	105 mins	Play Time
13:00-13:30	Lunch	30 mins	
13:30-16:00	Certificate Distribution		
	Buffer Time	150 mins	



Venture Center
100, NCL Innovation Park
Dr. Homi Bhabha Road, Pune -411008
Email: eventsdesk@venturecenter.co.in
Phone: +91-20250934

Workshop Includes

- Lunch Included
- Fun experiments and practical sessions
- **Electronics Kit to build and carry home**
- Joining a mailing list community of hobby robotics enthusiasts
- Certificate of Participation from Venture Center

Faculty

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

Profile : Indian National Maths Olympiad awardee , 1998 .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. Puzzle solving enthusiast. Founding member of IIT Kharagpur Robotics Club.

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; Currently Adjunct Faculty of Electrical Engg., College Of Engg. , Pune

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;Workshop on SPICE at College of Engg, Pune; Workshop on Digital Design at Venture Center, Pune, Workshop on Multi-Core computing at Venture Center , Pune , Workshop on Maths Olympiad Training at Venture Center , Pune.



Venture Center
100, NCL Innovation Park
Dr. Homi Bhabha Road, Pune –411008
Email: eventsdesk@venturecenter.co.in
Phone: +91-20250934

About the organizers

About Venture Center

Entrepreneurship Development Center (Venture Center) – a CSIR initiative – is a Section 25 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's focuses on technology enterprises offering products and services exploiting scientific expertise in the areas of materials, chemicals and biological sciences & engineering. For more information, visit <http://www.venturecenter.co.in>

About Antfarm Robotics Pvt. Ltd.

ANTFARM ROBOTICS PVT. LTD. is a Start-up in the field of Toy Robotics focused on building the next generation of smart toys for Kids based on Swarm Robotics. Based out of Pune, it is founded by Subhojit Basu, who has also been the founder member of Robotics Club in IIT Kharagpur. Subhojit is a VLSI designer by his education at IIT Kharagpur and has been working on Embedded Systems for some time now. ANTFARM is an associate incubatee at Venture Center, Pune.

Hobbykits (www.hobbykits.co.in) is a Brand of ANTFARM dealing with easy to assemble, hobby robotic kits for kids. The Product LineBot used in this workshop is a product of Hobbykits.