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Tinkering Lab Technical Workshops Series – 2018

Three Days Intensive Workshop on

Essentials of Arduino

“Learn about World's first Open Source Embedded Platform:Arduino”

- Organized by Venture Center -

Learn	<ul style="list-style-type: none"> • Getting Started with Arduino • Arduino Software (IDE) • Troubleshooting • Device and Programming basics • Projects with Sensors, Motors and Servo control <p><i>The workshop is intended to be basic</i></p>								
Organized by	<ul style="list-style-type: none"> • Tinkering Lab at Venture Center 								
For whom	<ul style="list-style-type: none"> • Industry professionals • Innovators & Entrepreneurs • Students 								
When	Tuesday-Thursday 16-18 October 2018 Time: 1630 – 1830								
Where	E-class room, Venture Center, 100 NCL Innovation Park, Dr. Homi Bhabha Road, Pashan, Pune-411008								
Contact	Technical queries: Ms Sayali 020-25865877/75/76 sayali@web.venturecenter.co.in Logistical queries: Ms Lipika 020-25865877/75/76 eventsdesk@venturecenter.co.in								
Cost	<p>Fees:</p> <table border="1"> <tr> <td>Large companies</td> <td>Rs. 10,000/-</td> </tr> <tr> <td>Micro, Small, Medium enterprises/ individuals</td> <td>Rs. 7000/-</td> </tr> <tr> <td>VC resident companies</td> <td>Rs. 5000/-</td> </tr> <tr> <td>Students with valid id card</td> <td>Rs. 3000/-</td> </tr> </table> <p>*Note: Fees once paid is not refundable under any circumstances</p> <p>Limited seats: 10 seats</p> <p>Note: Organizers reserve the right to accept or refuse or delay registrations so to optimize the composition of the group and hence maximize learning for all participants.</p> <p>How to apply?</p> <ul style="list-style-type: none"> • Apply online at: https://bit.ly/2oBXNgX • Participation to the workshop will be based on your application and inputs from the faculty. After reviewing the organizers will confirm your participation by sending you an acceptance mail • Email of acceptance > verification > Payment > Seat confirmation 	Large companies	Rs. 10,000/-	Micro, Small, Medium enterprises/ individuals	Rs. 7000/-	VC resident companies	Rs. 5000/-	Students with valid id card	Rs. 3000/-
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Introduction

The Arduino is a microcontroller that you can program to run motors and use along with sensors such as motion detectors, temperature sensors, etc. It can give your project interactivity without requiring an expensive and complicated circuit. Instead, you use a computer to program the Arduino, upload your code to the Arduino, and hook up your circuit on a breadboard. This workshop introduces the Arduino platform to the participants, and provides everyone with hands-on sessions using the Arduino. This workshop combines insightful lectures with practical lab exercises to reinforce key concepts.

Workshop Outline

This Course on the Arduino contains the following:

- Device and Programming basics
- Sensors:
 - Capacitive touch sensor.
 - Installing libraries: Altitude, Atmospheric pressure and Temperature sensor.
 - Understanding datasheets: Acceleration sensor, Luminosity sensor.
 - Threshold sensors: Light, Microphone and Vibration sensors.
 - Distance measurement: Ultrasound and IR distance sensors.
 - Motion detection: PIR sensor.
- Motor and Servo control: DC motor, Stepper motor, Servo.

Participants will have to bring their own laptops.

Participants should download and install the Arduino IDE software on their laptop prior to attending the first session: <https://www.arduino.cc/en/Main/Software>

One kit per participant will be given, which has to be returned at the end of the workshop.

(Optional: Participants can purchase the Kit at the price of 6500 INR during the workshop.)

Kit contains:

Acceleration (3-axis) - ADXL335	PIR motion sensor - HC-SR501	Wireless module - NRF24L01 (2)
Microphone/Light sensor - LM393	Demultiplexer - 74HC4051	OLED display
Vibration sensor - SW420	Rotary encoder - KY-040	Temperature - LM35
Capacitive touch sensor - TTP223	Adafruit motor shield v1.0 (clone) E-179	RFID module - RC522
IR reflectance sensor - TCRT5000/KY-008	Servo	DC motor (12V) 12 volt / 2 amp
Ultrasound distance sensor - HC-SR04	SD card shield	Stepper motor (12V)
IR distance sensor - GP2Y0A21YK	LCD module with I2C	L293D motor shield
Altitude, Atmospheric Pressure, Temperature - BMP280	5V relay - KY-019	Arduino UNO
Luminosity sensor - TSL2561	RF Link transmitter module	MM/MF/FF jumper cables
Optocoupler sensor module E-267	Bluetooth module - HC05	Medium-sized breadboard



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Workshop includes

- Theory sessions, demonstrations and hands-on lab sessions
- Access to restricted website with online compilation of resources
- Workshop includes tea/coffee.
- Certificate of participation issued by Venture Center
- Membership in mailing list to follow-up on workshop and intimation of relevant events/funding/ opportunities from Venture Center.
- One-year free reference membership to Venture Center Library (<http://www.vclibrary.org/>) 1-year Free Reference membership of Venture Center Library
- 30% discount on DIY membership for Tinkering lab and Prayashala for 3 months

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

- General information and useful contacts regarding Pune city are available on:<http://www.venturecenter.co.in/puneguide/>

Time (hrs)	Topic and Contents	Venue	Faculty
Day 1			
1630 – 1645	Welcome and background of Venture Center Introduction to Workshop	E-class room	Dr. V Premnath
1645 – 1730	Session 1	E-class room	Dr. ChiragKalelkar
1715 – 1730	Tea/Coffee	Foyer area	
1730 – 1830	Session 2 Lab session & hands-on experiments	E-class room	Dr. ChiragKalelkar & volunteers
Day 2			
1630 – 1715	Session 3	E-class room	Dr. ChiragKalelkar
1715 – 1730	Tea/Coffee	Foyer area	
1730 – 1830	Session 4 Lab session & hands-on experiments	E-class room	Dr. ChiragKalelkar & volunteers
Day 3			
1630 – 1730	Session 5	E-class room	Dr. ChiragKalelkar
1715 – 1730	Tea/Coffee	Foyer area	
1730 – 1830	Session 6 Lab session & hands-on experiments	E-class room	Dr. ChiragKalelkar & volunteers
1800-1830	Feedback and Valedictory	E-class room	Dr. V Premnath

Speakers (in alphabetical order of last names)

 ChiragKalelkar	<p>Dr. Chirag Kalelkar did Ph.D. in Physics from Indian Institute of Science, Bangalore in 2006. He worked as Faculty Research Associate at the University of Maryland (2006-2008), Enhanced Post-doctoral Fellow at the National Chemical Laboratory (2008- 2009), visiting Post-doctoral Fellow at the Raman Research Institute (2010-2011) and as Research Associate at the Massachusetts Institute of Technology (2011-2012). Dr Kalelkar works on aqueous foams. Presently, Dr Kalelkar is an Assistant Professor at the Indian Institute of Technology, Kharagpur.</p>
 Premnath Venugopalan	<p>Dr. 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.</p>

volunteers (in alphabetical order of last names)

 LokeshDhundhara	<p>Lokesh is an alumnus of IIT Bombay (2017) in Energy Sciences and currently working with Embryyo Technologies. He has multidisciplinary technical skills and takes care of developing early prototypes of novel ideas at Embryyo. His interests are electronics, automation, mechatronics and exploratory problems. He has worked on IOT projects, smart houses, and quadrotors. He is an enthusiastic cyclist, trekker, and traveler.</p>
 Prateek Jain	<p>Prateek Jain is currently a Chief Technology Officer at Embryyo Technologies. He founded Embryyo along with Nishant Kumar in 2014. Embryyo is a young medical technology company focuses on inventing technologies for the unmet clinical problems with breakthrough solutions. He has won several accolades as an innovator. He holds a B.Tech and M.Tech from IIT Bombay (2010) and has an experience in manufacturing, automation and problem-solving. He is an avid photographer and likes to capture nature's physical phenomenon.</p>
 AsheshPradhan	<p>AsheshPradhan is Sub-Head at SamudraManthan, IIT Kharagpur. Also he is a Third-year Undergraduate Student in the Department of Ocean Engineering and Naval Architecture at the Indian Institute of Technology, Kharagpur. He has interests in Robotics and electronics.</p>
 Ashwin Shankar	<p>Ashwin Shankar is founder of BatteryPool where he is building battery charging solutions for electric 2 wheelers. He is an Electrical Engineer with experience in public policy. He holds a BS in Electrical Engineering from Purdue University and an MS in Electrical Engineering from Stanford University. He has experience in the energy industry where he was building hardware for the oil & gas applications at Schlumberger Technology Corporation in Houston, Texas. Later, he was a public policy associate working with a non-profit on technology policy in the Indian context. He was also involved in the design and building of the Electrical Engineering Department's EV racing car for the Purdue EV Grand Prix. He is currently looking to use his exposure to public policy and electrical engineering background to help realize India's goal of electric mobility.</p>



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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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