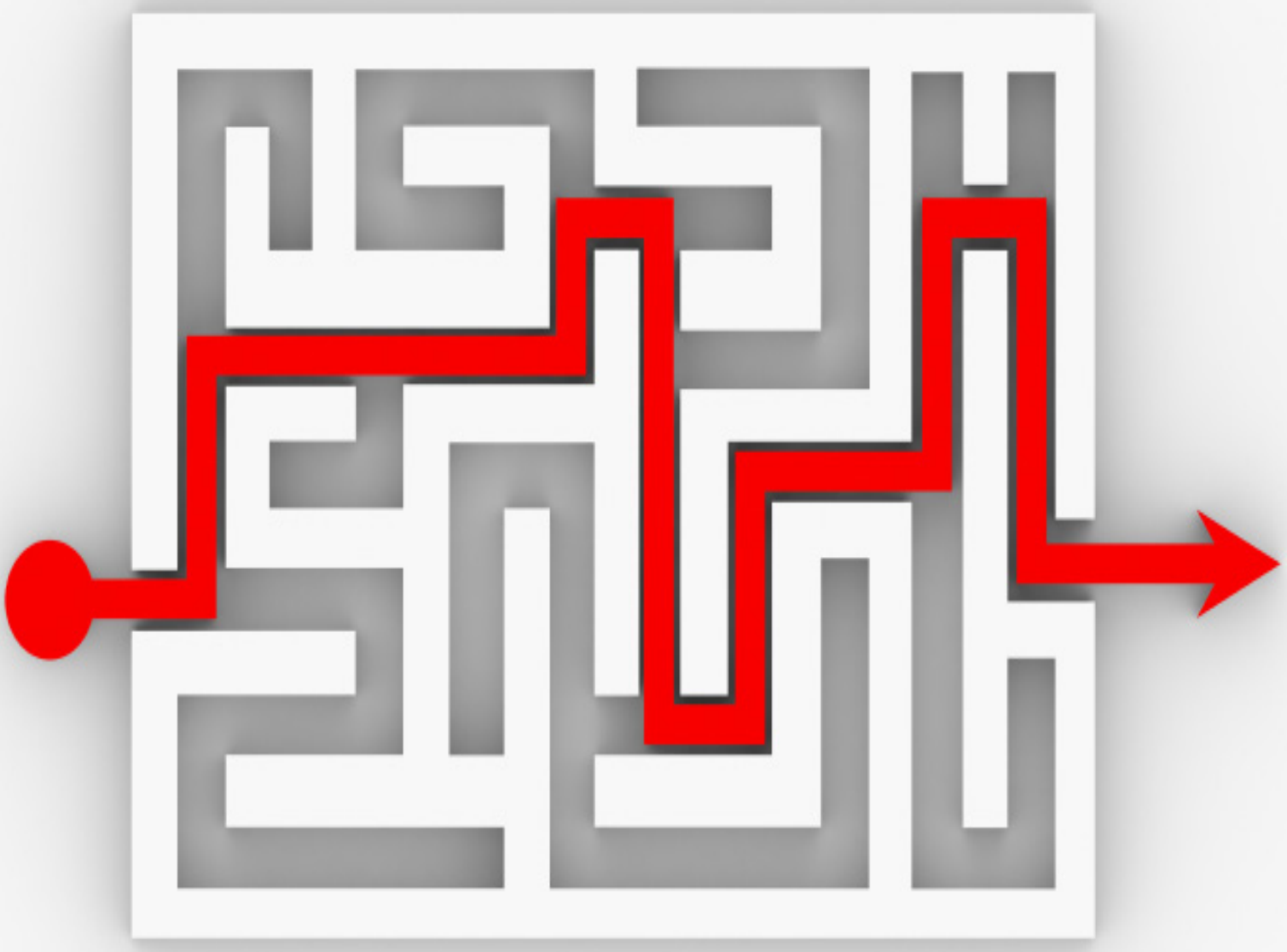
Discover Engineering @ Temasek Polytechnic

Workshops and Activities for Teachers & Students



Temasek POLYTECHNIC

2026

Foreword

At the School of Engineering, we run workshops for school teachers and fun enrichment activities for students, all aimed at sparking curiosity and showing the many opportunities that engineering has to offer.

Beyond the activities listed in this booklet, we can also customize learning journeys to suit the needs and interests of different student groups.

Feel free to reach out to our coordinator, Ms. Lily Sing, to plan your visit:

Ms Lily Sing
Email: Lily_SING@tp.edu.sg
Tel: 6780 5406

See You!

Outreach Team
School of Engineering
Temasek Polytechnic

P.S. We especially welcome workshops and centre visits on Wednesday and Friday afternoons during TP's term time—resources are usually more available then

At a Glance

Teachers' Workshop Series

These workshops typically take half a day or a full day.

1. Model Your Physics Lessons
2. Augmented Reality for Beginners
3. Chatbot Development for Non-Programmers

Workshops for Students

These workshops can be conducted within 1 and 2 hours.

Architectural & Built-Environment Workshops

1. Introduction to Digital Architecture
2. Design Your Zero Energy Classroom
3. Visualize Like a Built Environment Professional
4. Facility Management with BIM

Aerospace & Aviation Management Workshops

5. Introduction to Aviation Management
6. Fueling Dreams, Igniting Careers in Aerospace
7. Rocket Science in Action

Healthcare & Biomedical Engineering Workshops

8. From Genome to Proteome
9. Healthcare Analytics – Basic Supervised Machine Learning

Data Analytics and Coding

10. Enabling Excellence in Data Management
11 Introduction to Python
12. Code-free Mobile Apps Development

Electronics/Robotics/Automation Workshops

13. Fun with Cobots
14. Fun with Electronics
15. Fun with Microcontrollers
16. Build a Rain Water Detector

Sustainability & Climate Action Workshop

17. Experimenting with Renewable Energy

Demo Labs

18. Physics & Engineering Demo Labs

At a Glance

Short Courses

1. Printed Circuit Board (PCB) Design (1~2-day course)
2. Build a Line-tracking Robot (1 day course)
3. Applied Learning Modules (3-day course)
    - Behind the Scenes: The Making of Electronic Gadgets
    - Introduction to Aviation & Aerospace
    - Appreciating 3D Printing with Mechatronics
    - Smart IoT Devices and Virtual Reality
    - Sustainable Design and Management
    - Innovative and Fun Engineering

Centre Visits

Include a tour to one or two of our Centres of Excellence in your itinerary to learn about developments in the different technology areas. Visit to each centre takes about 30 mins.

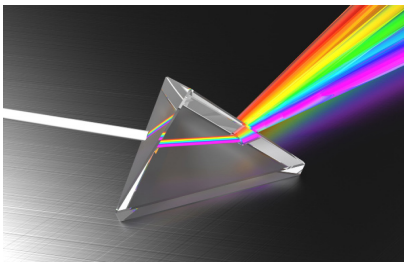
1. Enabling Technology Collaboratory
2. Clean Energy Research Centre
3. Healthcare Engineering Centre
4. Digital Fabrication and Additive Manufacturing Centre
5. Advanced Manufacturing Centre
6. Integrative Built Environment Centre
7. TP-Lufthansa Technical Training Centre
8. Aviation Research Centre
9. Robotics and Automation Centre

Teachers' Workshop Series

1. Model Your Physics Lessons

Physics, to some students, is a subject difficult to learn. This is usually because the students could not 'visualize' and relate the many concepts to their daily life. If educators can demonstrate the concepts and principles to the class, students would appreciate the subject a lot more.

In this half-day interactive hands-on workshop, participants will be introduced to several physics models/kits used to demonstrate concepts like reflection, refraction, total internal reflection, wave motion, etc. At the end of the workshop, participants can bring the back the models for their own use in the classroom.



Target Audience: All Secondary School Science (Physics) teachers, teaching assistants, TSOs
Duration: Half day
Pax: 12 **Cost:** FOC

2. Augmented Reality for Beginners

This workshop introduces participants to the use of immersive media especially Augmented Reality (AR) and the commonly used tools available in the market to develop the AR application (app).

Participants will be guided in the hands-on session to develop AR prototypes with the aim of introducing the technology into their own organisation.

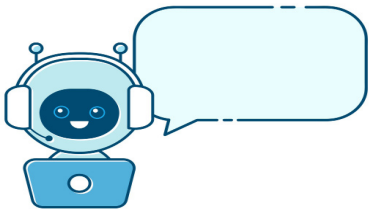
Target Audience: Individuals keen to acquire competency in developing AR app. Little or no programming background is required.
Duration: 1 day
Pax: 12 **Cost:** FOC

3. Chatbot Development for Non-Programmers

Chatbots are computer programs that use Artificial Intelligence to answer queries. They can vary from a simple database of questions and answers to massively complex problems which use dynamic data.

They are more efficient and effective compared to static Q&A. They also reduce labor cost and improve productivity.

This workshop introduces participants to chatbot development using cloud service tools. Participants will be guided to develop a chatbot in a hands-on lab session and learn how to integrate the chatbot to 3rd party applications.



Target Audience: Any individual who is interested in creating a chatbot to assist in queries related to learning or customer experience. No programming background is required
Duration: 1 day
Pax: 12 **Cost:** FOC

Architectural & Built-Environment Workshops

1. Introduction to Digital Architecture

Students will learn to create and render a building design model using a Building Information Modelling (BIM) software. They will have hands-on and be an architect for a day.

Duration: 2hrs Class Size: ~20 pax

Digital Architecture

2. Design your Zero Energy Classroom

There are many ways to make buildings energy efficient so as to leave a smaller carbon footprint.
This workshop culminates with a creative design activity where students attempt to design a classroom that requires zero energy!

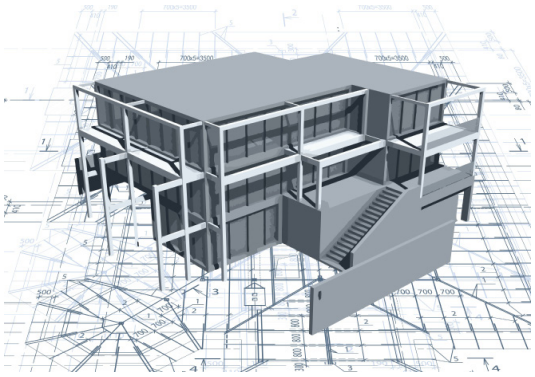
Duration: 2hrs Class Size: ~20 pax

Energy Conservation

3. Visualize Like a Built Environment Professional

What roles do engineers and architects have in the built environment industry? How do architectural drawings facilitate the communications between these 2 parties? Find out which role you are more inclined to.

Duration: 2hrs Class Size: ~20 pax



Architects or Engineers

4. Facility Management with BIM

A SMART nation can be built using a model-based process called Building Information Modelling (BIM). Learn how facility managers use BIM tools to design and maintain a small facility.

Duration: 2hrs Class Size: ~20 pax

Smart- Design and Maintenance

5. Introduction to Aviation Management

Students will be taken on a journey to get a glimpse of what they would learn in the course – from flight operations to airport management, and then to the basic flight controls of a plane.

Duration: 2hrs Class Size: ~20 pax

Airlines, Airports, Airplanes

6. Fueling Dreams, Igniting Careers in Aerospace

Want to know more about the roles that you can assume in the aviation and aerospace sector? Get enlightened on some of the "best jobs" and "hidden careers" in the industry! We will then take you on a tour of our hangar to view some of our aircraft systems and finally, hand over the controls of a drone flight simulator to you!

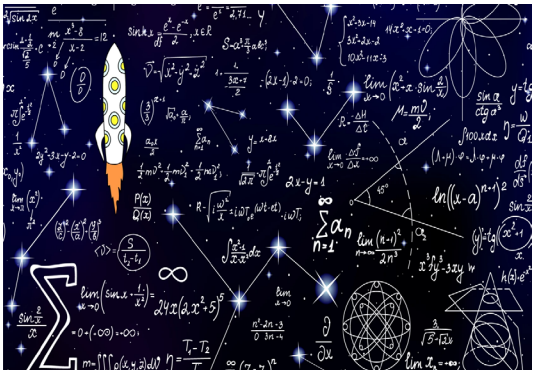
Duration: 2hrs Class Size: ~20 pax

Flight Controls

7. Rocket Science in Action

This hands-on STEM workshop uses air-powered stomp rockets to explore physics and engineering in a fun and interactive way. Participants build and launch their own rockets while learning about force, motion, and aerodynamics. The activity encourages curiosity, experimentation and teamwork—making science exciting and accessible for all.

Duration: 2hrs Class Size: ~20 pax



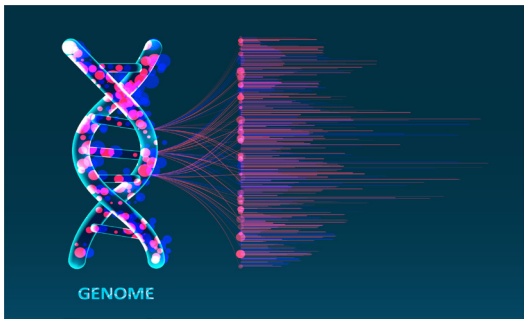
Rocket Science

Healthcare and Biomedical Engineering Workshops

8. From Genome to Proteome

You will learn the basics of genomics. Genes store a vast amount of information and gene activities can bring about illnesses and diseases. You will learn in this workshop how genetic information in cells can be decoded by studying the protein composition using biomedical equipment.

Duration: 2hrs Class Size: ~20 pax



Genome vs Proteome

9. Healthcare Analytics – Basic Supervised Machine Learning

In this workshop, you will learn the basics of supervised machine learning. You will learn about logistic regression and how to transform the "logit" function to the "sigmoid" function. You will then teach your machine to analyse data – such as a set of cancer data, so that whenever it is given a new data set, it is able to predict whether a tumour is likely to be malignant or benign.

Duration: 2hrs Class Size: ~20 pax


Machine Learning

Data Analytics

10. Enabling Excellence in Data Management

In today's data driven world, the effective use of Microsoft Excel is crucial in ensuring datasets are accurate and meaningful, so that analysis of data can be carried out smoothly. Join our introductory workshop to hone your skills to prepare and clean data lists for efficient data management and gain hands-on experience in creating personalized dashboards using VBA macro coding.

Duration: 2hrs Class Size: ~20 pax


Data Management with Excel

11. Introduction to Python

This is a beginners' course to the Python language. Students will learn the basic syntax of the language, know where Python can be used and the reasons for her huge popularity.

Duration: 2hrs Class Size: ~20 pax

Programming in Python

12. Code-free Mobile Apps Development

Mobile apps are a key part of everyday life. In this workshop, students will be introduced to mobile app development using a user-friendly, code-free online tool. They will gain practical hands-on experience and can continue developing their app even after the session

Duration: 2hrs Class Size: ~20 pax

Mobile Apps Development

Electronics/Robotics/Automation Workshops

13. Fun with Cobots

Cobots are special type of robots designed to work alongside human workers in collaborative applications. This workshop aims to introduce you to the world of Cobots. You will have fun learning to operate and program them. You will also get a chance to see Social Robots and Industrial Robots in action at various Centres at School of Engineering.

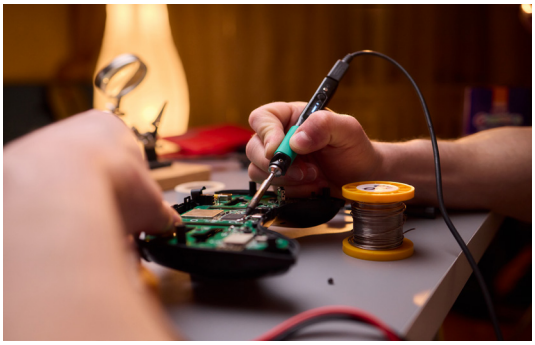
Duration: 2hrs Class Size: ~20 pax

Fun with Cobots

14. Fun with Electronics

Students will have hands-on practice to assemble their own electronic circuit by soldering components onto a Printed Circuit Board. Students will learn to read circuit schematics, identify the different electronic components and acquire awareness of product development.

Duration: 2hrs Class Size: ~20 pax

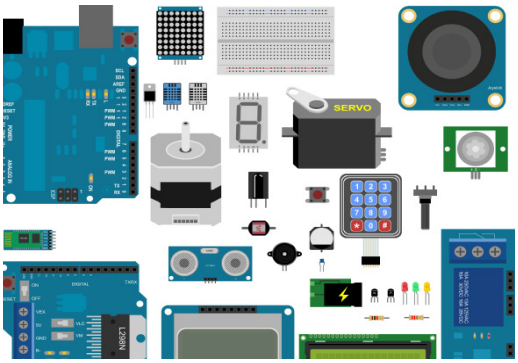


Fun with Electronics

15. Fun with Microcontrollers

This is an introductory workshop to microcontrollers. Students will learn to write simple programs for the Arduino Uno board to control motors, capture readings from sensors and move a robot.

Duration: 2hrs Class Size: ~20 pax

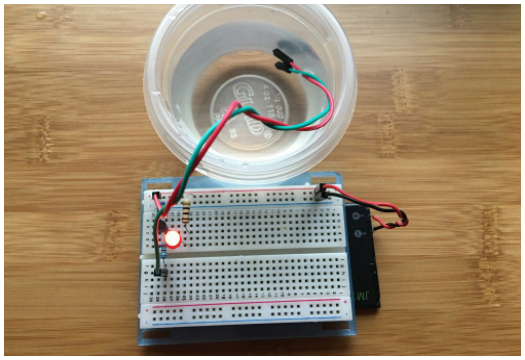


Fun with Micro-controllers

16. Build a Rain Water Detector

Do you have to bring in the laundry or close the windows whenever it rains? This gadget will alert you to do just that. You will learn how a transistor and a few other electronic components should be used. You will have hands-on practice to patch a circuit on a breadboard.

Duration: 1hr Class Size: ~20 pax



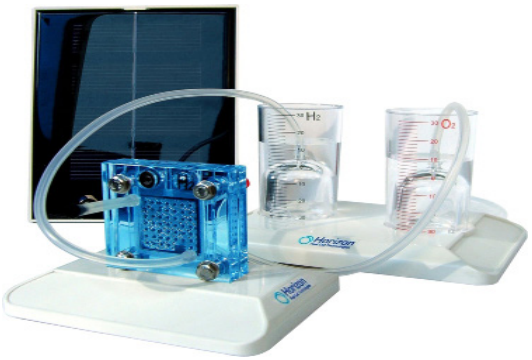
Rain Water Detector Kit

Sustainability and Climate Action Workshops

17. Experimenting with Renewable Energy

Renewable energy sources, such as solar, wind, hydro, geothermal and bioenergy, have the potential to replace fossil fuels in future. Participants will have hands-on practice to generate electricity using solar panels and/or fuel cells. Participants will also use instruments to verify the voltage and current, and understand the parameters affecting the electrical output from these energy sources.

Duration: 2hrs Class Size: ~20 pax



Solar Cells & Fuel Cells

Demo Labs

18. Physics and Engineering Demo Labs

Interesting exhibits to illustrate physics principles and engineering innovations have been curated at the the 2 labs Visit either one or both!

Duration: 1/2hr for each lab Class Size: ~20 pax

Short Courses

1. Printed Circuit Board (PCB) Design

Everyone can design and fabricate PCBs easily these days. We will guide you through the process of producing the Schematic, the PCB Layout and the manufacturing data using selected PCB Design software. You would then have hands-on practice assembling a PCB by soldering to produce a working prototype.

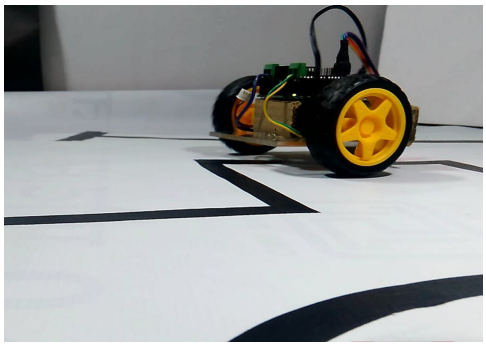
Duration:1~2 days Class Size: ~20 pax

PCB Design

2. Build a Line-Tracking Robot

In this workshop, students will be given a jump start to building a line tracking robot. Students will learn how the different parts of the robot works and learn how to code a robot to track a line.

Duration:1~2 days Class Size: ~20 pax



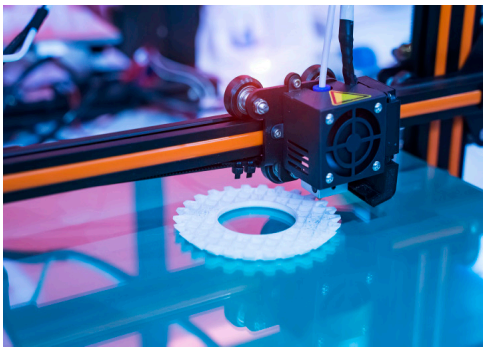
Line Tracking Robot

3. Applied Learning Modules@Poly

School of Engineering currently offers the following courses:

- Behind the Scenes: The Making of Electronic Gadgets
- Introduction to Aviation & Aerospace
- Appreciating 3D Printing with Mechatronics
- Smart IoT Devices and Virtual Reality
- Sustainable Design and Managment
- Innovative and Fun Engineering

For a complete listing of ApLM@Poly, please refer to:
https://www.tp.edu.sg/landing/educators/aplm.html



AEM- 3D Printing

Centre Visits

Here are some suggestions of Centres to visit:

1. **Enabling Technology Collaboratory**
   Learn how core enabling technologies, such as Artifical Intelligence, Machine Learning, Internet of Things and Immersive Media, are applied to solve industry problems at our test-bedding facility.

2. **Clean Energy Research Centre**
   Learn about Hydrogen Fuel Cells, Solar Cells, Power Monitoring Systems and even Electric Vehicles. Check out TP's eco-car that has taken the top spot in the annual Shell Eco-Marathon Race the last few years.

3. **Healthcare Engineering Centre**
   What are BioMEMS (Biomedical micro-electro-mechanical systems) based healthcare devices and systems? Learn about biosensors, microfluidics and wearable healthcare sensors here.

4. **Digital Fabrication & Additive Manufacturing Centre**
   Need to do 3D scan of objects and then replicate them? You will find all the necessary equipment here. Need to replicate a tooth? You can always 3D-print one here too.

5. **TP-Advanced Manufacturing Centre**
   You will see high speed, configurable production lines. Everything can be remotely monitored and controlled. Be ready for Industry 5.0!

6. **Integrative Built Environement Centre**
   Digital technologies are widely used in architectral design and systems monitoring. Learn how buildings can be designed to be energy efficient and how installations in facilities can be monitored.

7. **TP-Lufthansa Technical Training Centre**
   Students hone their hand skills to the industry's standards here. Get to know what their training involves and then visit the hangar to see some of our aircraft systems.

8. **Aviation Research Centre**
   Learn about the developments in unmanned aerial systems and use of cutting edge technologies for aircraft maintenance.

9. **Robotics and Automation Centre**
   Get a glimpse of robots built at the Centre!

Man & Machine

More information on our Centres can be found here: