THE HONG KONG POLYTECHNIC UNIVERSITY 香港理工大學
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FACULTY OF ENGINEERING 工程學院
WHERE CONCEPTS BECOME REALITY

Two days University Experience Programme (TUE 2025) - "From Physics and ICT to Engineering"

Date:	**16th & 17th July 2025 (Wednesday and Thursday)**
Venue:	V322
Target:	Secondary 4 or 5 students [taking Science, ICT or M1/M2 subject(s)]
Medium:	Cantonese (supplemented with English handouts)

Rundown

Day 1 *(16 July 2025)*

Time	Programme
10:00 a.m. - 10:10 a.m.	Registration
10:10 a.m. - 10:20 a.m.	Opening Ceremony
10:20 a.m. - 10:50 a.m.	Department of Biomedical Engineering • Thematic lecture: ***Similarities between Ultrasound Imaging and Christmas Cards***
10:50 a.m. - 11:10 a.m.	• Quiz (5 mins) • Break (15 mins)
11:10 a.m. - 11:40 a.m.	Department of Aeronautical and Aviation Engineering • Thematic lecture: ***Flying with the Wright Brothers: The First Successful Mechanical Flight and the State-of-the-art*** • Department and programme introduction
11:40 a.m. - 11:45 a.m.	• Quiz (5 mins)
11:45 a.m. - 1:00 p.m.	Lunch
1:00 p.m. - 1:30 p.m.	Department of Mechanical Engineering • Thematic lecture: ***Kinematics of Car and PolyU E-Formula Racing Team*** • Virtual PolyU E-Formula Racing Team garage tour • Chats with racing team students
1:30 p.m. - 1:50 p.m.	• Quiz (5 mins) • Break (15 mins)
1:50 p.m. – 3:30 p.m.	Lab Tour (4 labs)
3:30 p.m.	End of Day 1

Day 2 ***(17 July 2025)***

Time	**Programme**
10:00 a.m. - 10:10 a.m.	Registration
10:10 a.m. - 10:40 a.m.	Department of Electrical and Electronic Engineering • Thematic lecture: ***How do Electricity and Energy get to us?***
10:40 a.m. - 11:00 a.m.	• Quiz (5 mins) • Break (15 mins)
11:00 a.m. - 11:30 p.m.	Department of Electrical and Electronic Engineering • Thematic lecture: • ***Talk on Artificial Intelligence (AI) and IoT (Internet of Things)***
11:30 a.m. - 11:35 a.m.	• Quiz (5 mins)
11:35 a.m. – 12:45 p.m.	Lunch
12:45 p.m. - 1:15 p.m.	Department of Industrial and Systems Engineering • Thematic lecture: ***Smart Industry and Digital Design*** Showcase of project in AR (Augmented Reality)
1:15 p.m. - 1:35 p.m.	• Quiz (5 mins) • Break (15 mins)
1:35 p.m. - 2:35 p.m.	Lab tour (2 labs)
2:35 p.m. - 2:45 p.m.	Interactive Sharing with Engineering Student Ambassador (JUPAS programme choices, career aspiration, student life & experiences)
2:45 p.m. - 2:55 p.m.	Closing Ceremony
2:55 p.m. - 3:05 p.m.	Certificate Distribution
	End of Day 2

Remarks:

The University reserves the right to make changes to the above programme at any time if the changes are required. All successful registrants of the programme will be notified of the change by email and announcement will be made on the website.

Two days University Experience Programme (TUE) 2025 - "From Physics and ICT to Engineering"

University lectures on engineering applications:

Biomedical Engineering	**Topic:** ***Similarities between Ultrasound Imaging and Christmas Cards*** **Speaker:** Dr Hin Chung LAU, Senior Lecturer Department of Biomedical Engineering **Related topics in DSE:** Medical Physics [Secondary 4-6, Elective part IX] **Introduction:** Medical devices such as ultrasound scanners have enabled radiologists to see through the body without surgery. In this lecture, we will explore the similarities between ultrasound imaging and a typical Christmas card that one could buy from the stationary store. Students will get to know how ultrasound is generated and processed by the computer to generate an image.
Aeronautical and Aviation Engineering	**Topic:** ***Flying with the Wright Brothers: The First Successful Mechanical Flight and the State-of-the-art*** **Speaker:** Dr ZHANG Guohao, Research Assistant Professor, Department of Aeronautical and Aviation Engineering **Related topics in DSE:** • Principles of Flight • Aircraft Performance • Aviation Safety **Introduction:** The first mechanical flight was developed in 1903 by the Wright Brothers. At that time, they made the first sustained, controlled, powered, heavier-than-air manned flight successfully. Their design lays a foundation of mechanical flight and aircraft design, which further impacted the world and the aviation industry. How did Wright Flyer influence the future aircraft design? What are the basic principles of flight? How lessons learnt from the major accidents improve aviation safety and the safety culture? This lecture will guide you through all these topics from principles of flight, aircraft performance, flight mechanics, to aviation safety.

Mechanical Engineering	**Topic:** ***Kinematics of Car and PolyU E-Formula Racing Team*** **Speaker:** Ir Elsa TANG, Senior Instructor Department of Mechanical Engineering **Related topics in DSE:** Physics Speed, Velocity and Acceleration Renewable energy – Solar Energy **Introduction:** Nowadays, electric cars are commonly used over the world, such as Tesla. In these two years, Formula Electric car (Formula E) is also the big racing event in Hong Kong. When you design electric car, you should have theoretical and practical knowledge about electric motor, batteries, gearbox, power, torque, speed and acceleration. In this lecture, students will learn the basic theory of kinematics of racing car and different applications to car performance. Apart from the introduction of electric car, solar car is also the new trend in the renewable energy and sustainable environment.
Industrial and Systems Engineering	**Topic:** ***Smart Industry and Digital Design*** **Speaker:** Dr YM TANG, Senior Lecturer Department of Industrial and Systems Engineering **Related topics in DSE:** Physics, Science, Information and Communication Technology **Introduction:** Industry 4.0 is commonly referred to as the fourth industrial revolution and has been called a "smart industry". Within a smart industry, cyber-physical systems monitor physical processes, create a Virtual Reality (VR) of the physical world, utilize big data and Artificial Intelligence (AI) technologies to facilitate future industrial revolution. We will also explore how these technologies can be applied in digital design and innovation.

Electrical and Electronic Engineering	**Topic:** ***How do Electricity and Energy get to us?*** **Speaker:** Dr Kevin CHAN, Senior Lecturer Department of Electrical and Electronic Engineering **Related topics in DSE:** Electricity and Magnetism, Energy and Use of Energy **Introduction:** We cannot imagine our daily life without electricity as it is almost too easy for us to flip a switch or plug a cord to get electricity or energy in general. However, the process of getting electricity is not that straightforward. Also, alternative energy sources and humanity's energy consumption continues to be important issues for the world. This talk explores the ways how the electricity comes from various energy sources to us. The participants will recognize the electricity generation, transmission and distribution from the viewpoints of Electrical Engineering. **Topic:** ***Talk on Artificial Intelligence (AI) and IoT (Internet of Things)*** **Speaker:** Prof. Bonnie LAW, Associate Professor Department of Electrical and Electronic Engineering **Related topics in DSE:** ICT, programming **Introduction:** What is AI and IoT? Why are they important? What is the relationship between them? Machine Learning/Neural Networks/Backpropagation/Deep Learning Applications and Societal Impacts of AI and IoT

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