

# IoT Certification Programme: Start from Beginner to Advanced Level in 5 Days

Course Fee: HK\$12,000 (May apply up to HK\$8,000\* subsidy)

\*Maximum saving, with the final grant subjects to approval.



## What is Internet of Things (IoT) and why does it matter?

As the world becomes increasingly digital, everything from coffee machines to cars can quickly become part of IoT network. Gartner forecasted that 25 billion connected things will be in use by 2021.

The IoT will continue to deliver new opportunities for digital business innovation for the next decade.

**Prerequisites:** It is highly recommended that participants possess basic programming knowledge (Python).

## About this Program

This program walkthroughs basics, concepts and applications of IoT from ground up. It covers its core technologies, IoT infrastructure, platform design and building, basic programming, data analysis and machine learning in a progressive pace.

It focuses on many hands-on practical exercises, including DIY sensor project, programming the weather station, and machine learning programs for IoT data. You will understand why we need a proper IoT platform and leverage it to manage multitude of devices, protocols and applications. Common IoT protocols such as HTTP, MQTT will be reviewed and compared.

We will take a close look of how IoT empowers many industry applications through case studies in smart home, smart society, healthcare and telecommunications fields. Last but not least, the course discusses the controversial topic of Internet security and how to safeguard your IoT platform against cyber-attacks and abuse.

## Trainer Information

**Simon MOK** is an IT professional trainer for over 10 years covering IoT, data analytics, AI and machine learning and programming. He has rich experience in leading development team to deliver software solutions for clients. He is a M.Phil from the University of Hong Kong and MSc in Computer Science from the Chinese University of Hong Kong.

This course is an approved Reindustrialisation and Technology Training Programme (RTTP), which offers up to 2/3 course fee reimbursement upon successful applications. For details: <https://rttp.vtc.edu.hk>.

Programme code	10010153-01
Date and time	20, 27 Mar & 10, 17, 24 Apr 2021, 09:30 - 17:30 (Sat, 30 hours)
Venue	Classroom 112 & 125, 1/F, HKPC Building, 78 Tat Chee Avenue, Kowloon Tong  or Online Broadcast subject to the situation of COVID-19
Medium	Cantonese, supplemented with English terminology
Course fee	HK\$12,000 (May up to HK\$8,000* subsidy)
<b>Who Should Attend ?</b>	
<ul style="list-style-type: none"> <li>✓ IT manager</li> <li>✓ System analysts</li> <li>✓ Software architects</li> <li>✓ Software developers</li> </ul>	<ul style="list-style-type: none"> <li>✓ IoT hardware developers</li> <li>✓ Business analysts</li> <li>✓ Data analysts</li> <li>✓ Data scientists</li> </ul>



# IoT Certification: 5 Days from Beginner to Advanced

## Course Structure

Introduction to IoT (0.5 day)	Sensor DIY workshop (1.5 day)	IoT Platforms (1.5 day)	Machine learning on IoT data (1.5 day)
To elaborate the core technologies, including NFC, ZigBee, Bluetooth, behind IoT and the applications in different scenarios derived from these technologies	To build a IoT sensor using the popular ESP8266 component - through controlling input and output and connect to the Internet to submit sensed data	To elaborate the details of IoT platform, its emergence, components, key function of device management and two common protocols, HTTP and MQTT that work between IoT sensors and platforms	To elaborate the intelligence that can be gathered by the sensing data collected through IoT sensors and platforms – with a focus on different applicable and useful machine learning models – to build smarter applications
<ul style="list-style-type: none"> <li>❖ What is IoT?</li> <li>❖ Why IoT?</li> <li>❖ Solution architecture</li> <li>❖ Understanding device lifecycle</li> <li>❖ IoT technology overview               <ul style="list-style-type: none"> <li>- NFC</li> <li>- Bluetooth</li> <li>- BLE</li> <li>- ZigBee</li> <li>- Wi-Fi</li> <li>- NB – IOT</li> <li>- LTE – M</li> <li>- Lora</li> <li>- SigFox</li> <li>- Cellular technologies</li> </ul> </li> <li>❖ Common IoT use cases</li> </ul>	<ul style="list-style-type: none"> <li>❖ What is ESP8266?</li> <li>❖ Introduction to Arduino IDE</li> <li>❖ Working with Arduino libraries</li> <li>❖ Electronic basics for circuit design</li> <li>❖ Building prototypes on breadboard</li> <li>❖ Connecting to Internet</li> <li>❖ Input and output with serial monitor</li> <li>❖ Hand on exercise:               <ul style="list-style-type: none"> <li>- Controlling LED lights with GPIO</li> <li>- Building web interfaces to control lights</li> </ul> </li> <li>❖ Collecting temperature and humidity</li> <li>❖ Data visualisation on Blynk apps</li> <li>❖ Hand on exercise:               <ul style="list-style-type: none"> <li>- Building a weather station</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>❖ What is IoT Platform?</li> <li>❖ Cloud IoT platforms               <ul style="list-style-type: none"> <li>- AWS</li> <li>- Azure</li> <li>- Google</li> <li>- IBM</li> </ul> </li> <li>❖ IoT Communication Protocols               <ul style="list-style-type: none"> <li>- HTTP</li> <li>- XMPP</li> <li>- MQTT</li> <li>- CoAP</li> </ul> </li> <li>❖ Building pub/sub services on Eclipse Mosquitto</li> <li>❖ IoT Security</li> <li>❖ Authorization and Access Control List (ACL) on Mosquitto</li> </ul>	<ul style="list-style-type: none"> <li>❖ Understanding data analysis workflow</li> <li>❖ Introduction to CRISP-DM</li> <li>❖ Machine learning problem types</li> <li>❖ Supervised and unsupervised learning algorithms</li> <li>❖ Introduction to Python programming language</li> <li>❖ Python data analysis packages               <ul style="list-style-type: none"> <li>- NumPy</li> <li>- Pandas</li> </ul> </li> <li>❖ Scikit-learn machine learning examples</li> <li>❖ Computer vision and image processing techniques</li> <li>❖ Healthcare case study : Abnormality detection on patient data</li> <li>❖ Smart building case study: Predictive analytics on energy usage</li> </ul>

### Award of Certificate of Attendance

Attendance of a single Module will be awarded a Certificate of Attendance issued by the Hong Kong Productivity Council.

**Bring Your Own Device (BYOD):** Windows 7/10 / Mac OS 10.x or above with minimum 2 GB RAM and 20 GB hard disk

### RTTP Training Grant Application

Companies should submit their RTTP training grant application for their employee(s) via <https://rttp.vtc.edu.hk/rttp/login> at least two weeks before course commencement. Alternatively, [application form](#) could be submitted by email to [rttp@vtc.edu.hk](mailto:rttp@vtc.edu.hk) along with supporting documents.

## Enrolment Methods

1. Scan the QR code to complete the enrolment and payment online.
2. Mail the crossed cheque with payee name “Hong Kong Productivity Council” (in HK dollar) and the application form should be mailed to HKPC Academy, Hong Kong Productivity Council, 3/F, HKPC Building, 78 Tat Chee Avenue, Kowloon (attention to Ms Cherry LAM). Please indicate the course name and course code on the envelope.



[Enrolment Link](#)