

What is Internet of Things (IoT) and why it matters?

The Internet of Things or IoT refers to the billions of physical devices around the world that are connected to the internet. As the world becomes increasingly digital, everything from coffee machines to cars are quickly becoming part of this network. Gartner forecasted that the number of connected things in use will go up to 25 billion by 2021, from 14.2 billion in 2019.

"The IoT will continue to deliver new opportunities for digital business innovation for the next decade, many of which will be enabled by new or improved technologies," said Nick Jones, Research Vice President at Gartner.

The Diploma in Internet of Things (IoT)

As technology develops and changes it's important to keep your skills up to date. This diploma is designed to cover IoT from technology and application point of view, through IoT hands-on workshop, to IoT platforms and machine learning of IoT data.

Diploma Outline

The Diploma in Internet of Things (IoT)			
Course Title		Duration (Per Workshop)	Course Fee (Per Workshop)
Module 1	Introduction to Internet of Things (IoT) – Technologies and Applications	12 hours	HK\$4,800
Module 2	Python for IoT – Beginner to Advanced (RTTP Registered course)		
Module 3	IoT Sensor Do-It-Yourself (DIY) Experience Workshop (RTTP Registered course)		
Module 4	IoT Platforms (RTTP Registered course)		
Module 5	Machine learning for IoT Data (RTTP Registered course)		
<ul style="list-style-type: none"> • These programmes combine technical and non-technical content. Participants can make enrolments to the individual course based on their needs/ interests. • To attain the Diploma Certificate, participants are required to fulfil 75% attendance for all modules, i.e. module 1-5, pass the assessment and possess one of the following qualifications: <ol style="list-style-type: none"> 1. be a Certificate Holder in related areas; or 2. achieve 5 grade Es in HKCEE or equivalent; or 3. achieve 5 Level 2s in HKCEE or equivalent; or 4. achieve 5 Level 2s in HKDSE or equivalent; or 5. mature student* <p>* 18 years old or above and with 2 years or above working experience</p> 			

Diploma in Internet of Things (IoT): *Module 4: IoT Platforms*

**再工業化及科技培訓計劃 (RTTP)
認可課程**

企業完成審批後，可獲最多三份之二的
學費資助。

**Reindustrialisation and
Technology Training Programme
(RTTP) registered course**

After approval of the funding, 2/3 of
the course fee will be funded.

**16 – 17 Sep 2019 (Mon – Tue)
Course Code: 10008208-04**

Introduction

This module aims 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.

Objectives

- Understand the emergence of a new class of platform for IoT
- Understand the key concepts and components of an IoT platform
- Understand HTTP, MQTT in various IoT platforms, their differences; and actual working mechanisms
- Understand how IoT platform manages devices (e.g. sensors)
- Understand an IoT platform based on the Google IoT Cloud
- Understand the credentials and security enforced by IoT platforms

Target Audience

- IT Managers
- System Analysts
- Software Architects
- Software Developers
- IoT Hardware Developers
- Business Analysts
- Data Analysts
- Data Scientists

Prerequisites

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

Course Outline	
Day 1	Day 2
<p>Introduction</p> <ul style="list-style-type: none"> Emergence of IoT platforms IoT Platforms from different vendors <ul style="list-style-type: none"> Google IOT Amazon IOT Azure IOT Key Concepts Key Components <p>Protocols</p> <ul style="list-style-type: none"> MQTT HTTP <p>Device Security</p> <ul style="list-style-type: none"> Provisioning credentials Authentication Security standards Key strengths Public key format Key rotation Device security recommendations <p>Device, Configuration, and State</p> <ul style="list-style-type: none"> Device registration Device identifiers Device metadata Device configuration Device state Differences between device 	<p>Using MQTT Bridge</p> <ul style="list-style-type: none"> MQTT server Device authentication Publishing telemetry events Excessive load and exponential backoff Keep-alive <p>MQTT Client Samples</p> <p>Using HTTP bridge</p> <ul style="list-style-type: none"> Device authentication Publishing telemetry events Excessive load and exponential backoff Configuring devices <p>HTTP Client Samples</p> <p>Configuring Devices and Getting State</p> <ul style="list-style-type: none"> Protocol differences <ul style="list-style-type: none"> MQTT HTTP Updating and reverting device configuration Reviewing device configuration <p>Managing Credentials</p> <ul style="list-style-type: none"> Device authentication Generating an RS256 key Generating an ES256 key

metadata, configuration and state

Getting Started

- Setup Google Cloud
- Device registration
- Protocols (MQTT and HTTP)
- Device authentication
- Device control from the cloud

Creating registries and Device

- Creating a device registry
- Creating device key pairs
- Creating or editing a device
- Getting device details
- Deleting devices and registries

Gateway

- Overview
- Key Concepts
 - Bind/unbind
 - Attach/detach
- Setup
 - End-to-end demo

Access Control

- Roles
- Permissions

Logging and Monitoring

- Monitoring
- Logging
 - Audit logs
 - Device logs

Error Handling

- Error codes and error handling

End-to-End example

Module 4 Details

Date & Time:	16 – 17 Sep 2019 (Mon – Tue), 9:30am – 5:00pm
Duration:	6 hours per day, total 12 lecturing hours
Venue :	Hong Kong Productivity Council, 1/F, HKPC Building, 78 Tat Chee Avenue, Kowloon Tong, Kowloon, Hong Kong. (Kowloon Tong MTR Station Exit C)
Medium of Instruction :	Cantonese, and supplemented with English for technical terms
Award of Certificate :	Participants who have attained at least 75% attendance will be awarded a certificate of attendance issued by the Hong Kong Productivity Council
Course Fee :	HK\$4,800 Reindustrialisation and Technology Training Programme (RTTP) registered course – after approval of the funding, 2/3 of the course fee will be funded.

Application

To enrol, please complete the attached enrolment form and send it together with the appropriate fee to HKPC Academy, Hong Kong Productivity Council, 3/F, HKPC Building, 78 Tat Chee Avenue, Kowloon Tong, Kowloon, Hong Kong.

Attention: Ms KWOK.

[All cheques should be crossed and made payable to the Hong Kong Productivity Council.]

Participants are advised to make registration on or before 2 Sep 2019 (Mon).

Enquiries

Please call Ms KWOK at +852 2788 6271, fax +852 2190 9774 or email: fannie@hkpc.org

Website: <http://www.hkpcacademy.org>