

## Secondary Schools - The Hong Kong University of Science and Technology (HKUST)

### Dual Program 2023

### 中學／大學雙修課程 2023

#### Course Syllabus 課程大綱

Course Information 課程資料		Level 1 (Engineering —Robotics) 階段一（工程 — 機械人學）
Course Instructors 課程導師	Prof WOO Kam Tim (Department of Electronic and Computer Engineering) and his teaching team 胡錦添教授（電子及計算機工程學系）及其教學團隊	
Medium of Instruction 教學語言	Cantonese with lecture notes in English 廣東話，並輔以英文教材	
Time 上課時間	10:00 am - 1:00 pm	
Venue 地點	HKUST Campus 香港科技大學	

#### Course Objectives 課程目標

This is a course designed for students who would like to explore and understand the fundamental concepts and techniques of robotics. Robotics is not only limited to building humanoid robot or wheel-based robot. Embedded systems and programming are two other fundamental elements in this area. The course will start with an introduction to the important concepts of robotics, then proceed to learn different basic skills in electronics, physics, mathematics, mechanical systems and basic programming. In the class, students will understand how to apply mathematics knowledge in robotics applications. Besides traditional pedagogy, students will also learn the materials through in-class experiential learning activities, in-class hands-on experiments and “reflection on doing”.

本課程的目標是讓學生探索和理解機械人學的基本概念和技術。機器人學不僅限於建造人形機器人或輪型機器人，嵌入式系統及編程更是本學科的其中兩個重要原素。本課程將首先介紹機械人學的重要概念，然後將電子、物理、數學、機械系統和基本編程的不同基礎理論融入課程內。在課程中，學生將會了解如何把課程所學到的數學概念運用到機械人學應用中。除傳統的教學法外，學生還會透過課堂內的體驗式學習活動及動手做實驗來學習知識。

#### Assessment 評核方式

Classwork / Homework / Mid-term Test / Final Assessment (No make-up assessment is arranged)

課堂表現／功課／中期測試／期終評估（不安排後補評估）

**Remarks 備註**

1. Course schedule and content are subject to change if necessary.  
課程時間表及內容為暫定，會應需要而變更
2. Outstanding students will be promoted to DP Level 2.  
表現優異的同學可晉升雙修課程階段二。

## DP Level 1 (Engineering — Robotics) — Course Schedule

### 雙修課程 階段一（工程—機械人學）— 課程時間表

Session 節次	Date 日期	Topic 課題
1	25/11/2023 (Sat)	Basic Electronics and Electrical theory 基礎電子與電學理論
2	2/12/2023 (Sat)	Practicum of Basic Electronics and Electrical theory 基礎電子與電學理論
3	9/12/2023 (Sat)	Introduction to numbering System in Computer, Logic Gates, and Programming 電腦數位系統及基本邏輯閘認識與編程
4	16/12/2023 (Sat)	Arduino Programming on serial communications and data types Arduino編程 1
5	6/1/2024 (Sat)	Arduino Programming on variables and operators Arduino 編程 2
6	13/1/2024 (Sat)	Arduino Programming on the flows and arrays 傳感器應用及應用數學 1 與編程
7	20/1/2024 (Sat)	Sensor Applications with Applied Mathematics 1 and Programming 傳感器應用及應用數學 1 與編程
8	27/1/2024 (Sat)	Sensor Applications with Applied Mathematics 2 and Programming 傳感器應用及應用數學 2 與編程
9	3/2/2024 (Sat)	Sensor Applications with Applied Mathematics 3 and Programming 傳感器應用及應用數學 3 與編程
10	17/2/2024 (Sat)	Mini-project assessment
11	24/2/2024 (Sat)	H-bridge and Motor Control 1 and Programming H 橋和電機控制 1 與編程
12	2/3/2024 (Sat)	H-bridge and Variable Speed Motor Control 2 and Programming H 橋和變速電機控制 2 與編程
13	9/3/2024 (Sat)	Integration of Model Car System 模型車系統集成
14	16/3/2024 (Sat)	Wireless Communication and System Integration 無線通信與系統集成
15	23/3/2024 (Sat)	Other Controllable Devices 其他可控設備
16	6/4/2024 (Sat)	Assessment 評核
-	13/4/2024 (Sat)	Make-up Session (if any) 後補課節 (如有)