The Center for the Development of the Gifted and Talented
香港科技大學資優教育發展中心

For Reference only

Secondary Schools - The Hong Kong University of Science and Technology (HKUST) Dual Program 2024
中學／大學雙修課程 2024

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。

The Center for the Development of the Gifted and Talented
香港科技大學資優教育發展中心

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	23/11/2024 (Sat)	Introduction to numbering System in Computer 電腦數位系統及基本邏輯閘
2	30/11/2024 (Sat)	Basic Electrical theory and Practicum 基礎電學理論和實習
3	7/12/2024 (Sat)	Practicum of Soldering techniques 焊接技術實習
4	14/12/2024 (Sat)	Logic Gates, and Data Types in Programming 數據類型與編程 Arduino Programming Arduino編程 1
/	*21/12/24 (Sat)*	*No Class*
/	*28/12/24 (Sat)*	*No Class*
5	4/1/2025 (Sat)	Arduino Programming on variables and operators Arduino 編程 2
6	11/1/2025 (Sat)	Arduino Programming 3 on the flows and arrays Arduino 編程 3
7	18/1/2025 (Sat)	Sensor Applications with Applied Mathematics 1 and applied Arduino Programming 傳感器應用及應用數學 1 與 Arduino 編程應用
8	25/1/2025 (Sat)	Sensor Applications with Applied Mathematics 2 and applied Arduino Programming 傳感器應用及應用數學 2 與 Arduino 編程應用
/	1/2/2025 (Sat)	*No Class [4th day of Chinese New Year]*
9	8/2/2025 (Sat)	Sensor Applications with Applied Mathematics 3 and applied Arduino Programming 傳感器應用及應用數學 3 與 Arduino 編程應用
10	15/2/2025 (Sat)	Mini-project assessment
11	22/2/2025 (Sat)	H-bridge and Motor Control and applied Arduino Programming H 橋和電機控制與 Arduino 編程應用
12	1/3/2025 (Sat)	H-bridge and Variable Speed Motor Control 2 and applied Arduino Programming H 橋和變速電機控制與 Arduino 編程應用
13	8/3/2025 (Sat)	Integration of Model Car System 模型車系統集成與 Arduino 編程應用
14	15/3/2025 (Sat)	Wireless Communication and applied Arduino Programming 無線通信與與 Arduino 編程應用
15	22/3/2025 (Sat)	Other Controllable Devices and applied Arduino Programming 其他可控設備與 Arduino 編程應用
16	**29/3/2025 (Sat)**	**Assessment** **評核**
-	5/4/2025 (Sat)	Make-up Session (if any) 後補課節 (如有)