

Secondary Schools - The Hong Kong University of Science and Technology (HKUST)
Dual Program 2018
Level 1 (Engineering — Robotics)

中學／大學雙修課程 2018
階段一（工程 — 機械人學）

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 on electronic, physics, mathematics, mechanical systems and basic programming. In the final stage, students will understand how to apply the mathematics knowledge in robotics applications. Besides traditional pedagogy, students will also learn the materials through experiential learning activities 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元素。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。在課程末段，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，學生還會透過體驗式學習活動來學習知識。

Pre-requisite 修讀條件

S.2 students or above with knowledge of junior secondary school mathematics and integrated science

** Shortlisted applicants may be invited to attend an interview*

具備香港初中數學及綜合科學知識的中二或以上學生

** 申請者或須按安排出席面試*

Course Instructor 課程導師

Dr Woo Kam Tim (Department of Electronic and Computer Engineering)

胡錦添博士（電子及計算機工程學系）

Medium of Instruction 教學語言

Cantonese with lecture notes in English

廣東話教學，並輔以英文教材

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）

Venue 地點

HKUST Campus 香港科技大學

Remarks 備註

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



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	Time 時間	Venue 地點	Topic 課題
1	24/11/2018 (Sat)	To be confirmed 待定	To be confirmed 待定	Commencement Ceremony 開學典禮
		2:00 – 5:00 pm		Introduction of Robotics 機械人學簡介
2	1/12/2018 (Sat)	2:00 – 5:00 pm		Arduino Programming Arduino 編程
3	8/12/2018 (Sat)			
4	15/12/2018 (Sat)	12:30 – 2:00 pm		▲ Tutorial 1 (Optional) ▲ 導修課 1 (選擇參與)
		2:00 – 5:00 pm		Pulse Generation and its Application 脈衝形成及其應用
5	5/1/2019 (Sat)	2:00 – 3:00 pm		Basic Electronics 基礎電子
		3:00 – 5:30 pm		* Student Activity Day (Mandatory) 學生活動日 (所有學生必須出席)
6	12/1/2019 (Sat)	2:00 – 5:00 pm		Energy and Power 能源和電力
7	19/1/2019 (Sat)			Basic Mathematics: Straight Line Equation and its Applications 基礎數學：直線方程及其應用
8	26/1/2019 (Sat)			Transistor 晶體管
9	2/2/2019 (Sat)			H-bridge and Motor Control H 橋和電機控制
10	23/2/2019 (Sat)	12:30 – 2:00 pm		One-wheel Motor Control 單輪電機馬達控制
11	2/3/2019 (Sat)			2:00 – 5:00 pm
		Mid-term Assessment 中期評估		One-wheel Motor Control with Sensor 單輪電機馬達控制及感應器
12	9/3/2019 (Sat)	2:00 – 5:00 pm		Two-wheel Motor Control 雙輪電機馬達控制
13	16/3/2019 (Sat)		Remote Controller 遙控系統	
14	23/3/2019 (Sat)		Basic Motor Structure and its Control Algorithms 馬達結構及控制原理	Basic Mathematics: Vectors 基礎數學：矢量
15	30/3/2019 (Sat)	12:30 – 2:00 pm	▲ Tutorial 3 (Optional) ▲ 導修課 3 (選擇參與)	
		2:00 – 5:00 pm	Introduction of Advanced Wheeling System 進階轉動系統	
16	6/4/2019 (Sat)	2:00 – 5:00 pm	Assessment 評核	
	13/4/2018 (Sat)	To be confirmed 待定		Make-up Session in case of Bad Weather 天氣惡劣的後補課節

▲ Tutorial: Conducted by Dual Program alumni. **For signed-up students only.** 導修課：由雙修課程舊生指導。只限已報名同學參與。

*Student Activity Day: Students will have a chance to participate in enrichment activities outside classroom. Apart from it, CDGT will organize a wide range of activities and programs such as campus tour and mentorship scheme for students. Details will be announced later.

學生活動日：學生將有機會走出課室參與活動及參觀。除此以外，CDGT 將舉辦更多活動，如：校園探索之旅及師友計劃，以助學生作全面發展。詳情容後公布。