

The Chinese University of Hong Kong
Faculty of Science
Science Academy for Young Talent

Summer Courses 2023
Course Outline

STEM1020 Robotics in the Real-World
現實生活中的機械人

Introduction: The course will cover some basic elements within robotics, from the introduction to the role of robotics in the modern society, the history and the state-of-the-art developments in robotics, to some basic concepts in robotics related to the modelling, control and feedback. In addition to lecture classes, the hands-on component would allow students to apply their learnt knowledge to enable robot manipulators to perform some specific tasks.

課程將講述機械人的基本知識，包括其在現今社會的地位，歷史及控制機械人的基本概念。除課堂講解外，透過實驗活動同學更可嘗試操控機械人手臂以完成特定的指令。

Medium of Instruction: Cantonese supplemented with English
粵語主講及輔以英語

Organising Unit: Faculty of Engineering & Faculty of Science, CUHK

Teachers:



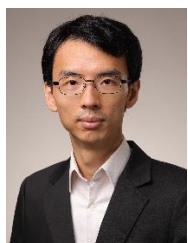
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Course Content:

Date	AM session (9:30 am – 12:30 pm)	PM session (1:30 pm – 4:30 pm)
15 August 2023 (Tuesday)	Mathematics 1: Basic trigonometry, matrices and transformations	Engineering Workshop 1: Robotics and robot arm introduction
16 August 2023 (Wednesday)	Physics 1: Vectors; Newton's laws of motion	Engineering Workshop 2: Robot calibration and introduction to programming
17 August 2023 (Thursday)	Mathematics 2: Homogeneous transformations and forward kinematics	Engineering Workshop 3: Trajectory
18 August 2023 (Friday)	Physics 2: Newton's laws of motion; Projectile motion	Engineering Workshop 4: Programming and movement of robot arms
21 August 2023 (Monday)	Physics 3: Torque and static equilibrium	Engineering Workshop 5: Hands-on time for kinematics and project
22 August 2023 (Tuesday)	Mathematics 3: Inverse kinematics and singularity	Engineering Workshop 6: Hands-on time for kinematics and project
23 August 2023 (Wednesday)	Physics 4: Assessment Mathematics 4: Assessment	Engineering Workshop 7: Assessment
24 August 2023* (Thursday)	Make-up class	

Duration	7 day sessions (total 42 contact hours)
Date	15 – 18, 21 – 23 August 2023 24 August 2023* (make up class)
Time	9:30 am – 12:30 pm & 1:30 pm – 4:30 pm
Teaching Mode	Face to Face (The Chinese University of Hong Kong)
Enrollment	30 – 50
Expected Applicants	Students studying S4-S6 or equivalent who must have taken at least one science course which include Biology, Chemistry, Combined Science, Physics, Information and Communication Technology, Design and Applied Technology, Mathematics Extended Module 1 or 2
Tuition Fee	HKD 3,500.00
Credit	2 University Unit Certificate of completion will be awarded to students who pass the assessment (if applicable) and attain at least 75% attendance.
Grading Methods	Pass / Fail

* This date is reserved for make-up classes in case there is any cancellation of classes due to unexpected circumstances.