

## 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 (Physics) 階段一 (物理)
Course Instructors 課程導師	Session 1 – 9 Dr. FUNG Ho Ting Tony (Office of the Dean of Engineering) 馮顯霆博士 (工學院)  Session 10 – 17 Dr. CHOY Ting Pong (Department of Physics) 蔡定邦博士 (物理系)
Medium of Instruction 教學語言	English 英語授課
Time 上課時間	2:00 pm - 5:00 pm
Venue 地點	HKUST Campus 香港科技大學

#### Course Objectives 課程目標

This is a calculus-based physics course on Newtonian mechanics, thermodynamics, electromagnetism and modern physics. The course will focus not only on technical skills, but also fundamental concepts. By learning at an accelerated pace suitable for talented students, it aims at bridging them to future university-level courses with solid background. This course will adopt blended learning in order to maximize learning effectiveness.

本課程乃以微積分為基礎之物理課。內容包括牛頓力學、熱力學、電磁學及現代物理學。課程內容基本概念與計算技巧並重。資優學生可以其能力所及之較快進度完成中學物理課程，為銜接大學課程打好堅實基礎。此外，為提升學生的學習效益，此課程將採用混合教學模式。

#### Pre-requisite 修讀條件<sup>#</sup>

Grade B or above in DP Pre-stage (Physics), Level 1 (Mathematics) or have obtained equivalent knowledge.

雙修課程預備階段(物理)或階段一(數學)取得 B 級或以上，或掌握同等知識。

*<sup>#</sup> Students who have not obtained Grade B or above in DP Pre-stage Physics/Level 1 Mathematics before will be invited to sit for a screening test 沒有於雙修課程預備階段(物理)或階段一(數學)取得 B 級或以上成績的同學將被安排參加甄別試。*

**Assessment 評核方式**

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

課堂表現／功課／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 (Physics) — Course Schedule**  
**雙修課程 階段一（物理） — 課程時間表**

Session 節次	Date 日期	Time 時間	Delivery Mode 授課模式	Topic 課題
1	25/11/2023 (Sat)	2:00 pm – 5:00 pm	Interactive Learning Session 互動學習課堂	<b>I. Mechanics 力學：</b> Kinematics 運動學
2	2/12/2023 (Sat)	2:00 pm – 4:00 pm	Blended learning mode* 混合教學模式* [Lecture videos + Interactive Learning Session] [教學影片 + 互動學 習課堂]	Newton's Laws of Motion 牛頓運動定律
3	9/12/2023 (Sat)	2:00 pm – 4:00 pm		Applications of Newton's Law 牛頓運動定律之應用
4	16/12/2023 (Sat)	2:00 pm – 4:00 pm		Statics and Torque 靜力學及力矩
n/a	6/1/2024 (Sat)	2:00 pm – 3:30 pm		Online Tutorial 網上導修課
5	13/1/2024 (Sat)	2:00 pm – 4:00 pm		Work and Energy 功和能量
6	20/1/2024 (Sat)			Conservation Laws 守恒定律
7	27/1/2024 (Sat)			<b>II. Thermodynamics 熱力學：</b> Temperature, Heat and Ideal Gas 溫度、熱和理想氣體
8	3/2/2024 (Sat)			First Law of Thermodynamics 熱力學第一定律
9	17/2/2024 (Sat)			Heat Engine and the Second law of Thermodynamics 熱機和熱力學第二定律
10	24/2/2024 (Sat)			<b>III. Electrostatic and Magnetism 電和磁：</b> Coulomb's Law and Electric Field 電荷、電場和電勢
11	2/3/2024 (Sat)			Gauss's law and Electric Potential 高斯定理和電勢
12	9/3/2024 (Sat)			Current and DC Circuit 電流和直流電路
13	16/3/2024 (Sat)			Capacitor and Kirchhoff's Rules 電容器和基爾霍夫規則
n/a	23/3/2024 (Sat)			2:00 pm – 3:30 pm
14	6/4/2024 (Sat)			<b>IV. Modern Physics 現代物理學：</b> Introduction to Einstein's Relativity I 愛因斯坦相對論簡介之一
15	13/4/2024 (Sat)			Introduction to Einstein's Relativity II 愛因斯坦相對論簡介之二
16	20/4/2024 (Sat)			Introduction to Quantum Mechanics 量子力學簡介
17	27/4/2024 (Sat)	2:00 pm – 5:00 pm	<b>Assessment 評核</b>	
-	4/5/2024 (Sat)	To be confirmed 待定	To be confirmed 待定	Make-up Session (if any) 後補課節 (如有)

\* The blended learning mode consists of lecture videos and class activities. The instructor will upload the lecture video (duration: approximately 1 hour) a few days before the lesson. Students can watch the lecture video whenever best fits their schedule. Students are expected to watch the video before attending the Interactive Learning Sessions and then participate in the in-class activities, such as problem-solving exercise or group discussion, based on the lecture video.

混合教學模式包括教學影片及課堂活動。導師會於上課前數天，將教學影片(約長1小時)上載至網上學習平台。學生須於互動學習課堂之前，自行安排時間觀看觀看教學影片，然後於課堂上參與和教學影片有關的活動(例如解難練習及小組討論)。