

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

Summer Courses 2024  
Course Outline

*CUSA1071 How Chemistry Works*  
化學的真相

**Introduction:** This course is designed for students to learn about some fundamental chemical principles. Students will learn the basic principles of chemistry including atoms and molecules, structure and chemical bonding, molecular geometry, and properties. This course is conducted in the format of a lecture.

本課程的設計旨在讓同學學到一些基礎化學原理。同學會在課程中學到基礎化學原理如原子與分子、結構與化學鍵合、分子幾何及特性。課程以講課形式進行。

**Medium of Instruction:** Cantonese supplemented with English  
粵語輔以英語

**Organising Unit:** Department of Chemistry, Faculty of Science, CUHK

**Teachers:**



**Dr. MAK Kin Wah Kendrew (麥建華博士)**

Senior Lecturer

Department of Chemistry, CUHK

Rm. 355, Science Centre South, CUHK

Tel: 3943 8136, Email: [kendrewmak@cuhk.edu.hk](mailto:kendrewmak@cuhk.edu.hk)

**Course Content:**

15 July 2024 (Monday)  9:30 am – 12:30 pm	<p><b><u>Lecture:</u></b>  <b>Atoms and Molecules, Structure and Chemical Bonding (1)</b>  - The simple atomic models and atomic structure  - The organization of the modern periodic table  - The electron arrangement of an atom</p> <p><b><u>Assessment:</u></b>  Short-answer exercises and quizzes</p>
18 July 2024 (Thursday)  9:30 am – 12:30 pm	<p><b><u>Lecture:</u></b>  <b>Atoms and Molecules, Structure and Chemical Bonding (2)</b>  - The atomic line spectrum of hydrogen  - The energy states of a hydrogen atom and the Bohr’s atomic model  - Wave behaviour of electrons  - Atomic orbitals (<i>s</i>, <i>p</i>, and <i>d</i>-orbitals)  - Electron configurations of atoms and ions</p> <p><b><u>Assessment:</u></b>  Short-answer exercises and quizzes</p>
22 July 2024 (Monday)  9:30 am – 12:30 pm	<p><b><u>Lecture:</u></b>  <b>Atoms and Molecules, Structure and Chemical Bonding (3)</b>  - Electronegativity and bond polarity  - Predicting the shape of a molecule (the Valence Shell Electron Pair Repulsion Theory)  - Predicting the polarity of a molecule using VSEPR Theory</p> <p><b><u>Assessment:</u></b>  Short-answer exercises and quizzes</p>
25 July 2024 (Thursday)  9:30 am – 12:30 pm	<p><b><u>Lecture:</u></b>  <b>Atoms and Molecules, Structure and Chemical Bonding (4)</b>  - Hybridization of atomic orbitals  - Two types of covalent bonds (sigma (<math>\sigma</math>) and pi (<math>\pi</math>) bonds)  - Orbital hybridization and nature of bonding\</p> <p><b><u>Assessment:</u></b>  Short-answer exercises and quizzes</p>
26 July 2024* (Friday)  9:30 am – 12:30 pm 2:00 pm – 5:00 pm	Make-up Class

<b>Date</b>	15, 18, 22, 25, 26* July 2024 (12 hours)				
<b>Time</b>	9:30 am – 12:30 pm				
<b>Teaching Mode</b>	Face to Face (The Chinese University of Hong Kong)				
<b>Enrollment</b>	20 – 30				
<b>Expected Applicants</b>	Students who are studying S1 – S3				
<b>Tuition Fee</b>	HKD 2,520.00				
<b>Credit</b>	0.75 Academy Unit(s) <i>Students can accumulate credits which will be regarded as “Other Learning Experience” when applying University.</i>				
<b>Grading Methods</b>	<b>Certificate</b>	<b>Assessment</b>	<b>Attendance</b>	<b>Credit(s)</b>	
	<b>Distinction</b>	<i>Certificate of Distinction</i>	<i>Excellent</i>	<i>&gt;75%</i>	<i>0.75</i>
	<b>Pass</b>	<i>Certificate of Merit</i>	<i>Pass</i>	<i>&gt;75%</i>	<i>0.75</i>
	<b>Attended</b>	<i>Certificate of Attendance</i>	<i>Fail</i>	<i>&gt;75%</i>	<i>0</i>
	<b>Fail</b>	<i>N/A</i>	<i>Fail</i>	<i>N/A</i>	<i>0</i>

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