

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

Summer Courses 2021  
Course Outline

*SAYT1001 Bondings in Organic Compounds, and  
Reactivity and Selectivity of Organic Reactions*  
有機化合物的鍵合，與有機反應的活性及選擇性

**Introduction:**

This course is designed to allow students to have a basic understanding about the bonding and structures of organic molecules and ions, and their influences on the molecular properties of organic compounds, and the reactivity and selectivity of some organic reactions. This course will focus on the stability of reaction intermediates, and the reactivity and selectivity of addition reactions, nucleophilic substitutions, eliminations, and electrophilic aromatic substitutions.

本課程設計旨在讓同學對有機分子及離子的鍵合及結構，及它們在有機分子的特性和有機反應的活性及選擇性的影響上有基礎的理解。本課程將會集中討論各類反應中間體的穩定性，及加成反應、親核取代反應、消除反應和親電芳香取代反應的活性及選擇性。

**Medium of Instruction:** English supplemented with Cantonese

**Organising Unit:**

Department of Chemistry, Faculty of Science, CUHK

**Teachers:**

Dr. Mak Kin Wah

Department of Chemistry, CUHK

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**Course Content:**

<p>9 August 2021 (Monday)</p> <p>9:30am – 12:00pm 2:00pm – 4:30pm</p>	<p><b><u>Lecture and Activities:</u></b></p> <ul style="list-style-type: none"> <li>• Basic atomic structure, chemical bonding and shape of molecules</li> <li>• Atomic orbitals (s, p, d, f) and electron configurations</li> <li>• Formation of <math>\sigma</math>-bonds and <math>\pi</math>-bonds</li> <li>• Orbital hybridization, bond formation and molecular shapes</li> </ul> <p><b><u>Assessment:</u></b></p> <ul style="list-style-type: none"> <li>• Multiple-choice and short-answer test</li> </ul>
<p>10 August 2021 (Tuesday)</p> <p>9:30am – 12:00pm 2:00pm – 4:30pm</p>	<p><b><u>Lecture and Activities:</u></b></p> <ul style="list-style-type: none"> <li>• Delocalized electrons and resonance</li> <li>• Resonance structures and resonance stabilization</li> <li>• Nomenclature of organic compounds</li> <li>• Reaction of alkanes and alkenes</li> <li>• Reaction mechanism</li> </ul> <p><b><u>Assessment:</u></b></p> <ul style="list-style-type: none"> <li>• Multiple-choice and short-answer test</li> </ul>
<p>11 August 2021 (Wednesday)</p> <p>9:30am – 12:00pm</p>	<p><b><u>Lecture and Activities:</u></b></p> <ul style="list-style-type: none"> <li>• Nucleophilic substitutions: SN1 and SN2</li> <li>• Elimination reactions: E1 and E2</li> </ul> <p><b><u>Assessment:</u></b></p> <ul style="list-style-type: none"> <li>• Multiple-choice and short-answer test</li> </ul>
<p>13 August 2021* (Friday)</p> <p>9:30am – 12:00pm 2:00pm – 4:30pm</p>	<p>Make-up class</p>

<b>Duration</b>	2.5 day sessions (total 15 contact hours)
<b>Date</b>	9 – 11 August 2021 13 August 2021* (make up class)
<b>Time</b>	9:30am – 12:00pm; 2:00pm – 4:30pm
<b>Teaching Mode<sup>#</sup></b>	Face to Face (The Chinese University of Hong Kong)
<b>Enrollment</b>	25
<b>Expected applicants</b>	Students who are promoting to or studying S4-S6
<b>Tuition Fee</b>	HKD 3,000.00
<b>Credit</b>	1 University Unit Certificates or letters of completion will be awarded to students who attain at least 75% attendance.

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

# This course is offered face-to-face lessons at CUHK campus. It may switch to online teaching in accordance with the pandemic development and the policy of the university.