

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

Summer Courses 2019  
Course Outline

***CUSA1007 Climate Physics and Chemistry***  
**氣候物理與化學**

**Introduction:**

This course presents an integrated scientific introduction to our climate system, focusing on the physics and chemistry of the atmosphere and ocean. The course applies basic scientific and mathematical principles to explain the history, current state and future projections of weather and climate, natural hazards, human-induced climate change, as well as their impacts on natural ecosystems and human society. Students will learn to build a simple climate model using computer software.

本課程綜合介紹我們的氣候系統，重點討論大氣層與海洋的物理和化學。課程利用基本科學和數學原理來解釋天氣及氣候的歷史、現狀和未來預測，探討在人為影響下所構成的自然災害及全球氣候變化，及其對自然生態和人類社會的影響。學生亦會運用電腦程式來學習建構簡單的氣候模型。

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

**Organising Unit:**

Earth System Science Programme  
Faculty of Science, The Chinese University of Hong Kong

**Teacher:**

Professor Amos Tai  
Earth System Science Programme, CUHK  
Rm. 316, Mong Man Wai Building, CUHK  
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**Course Content:**

<p>26 August 2019 (Monday)</p> <p>9:30 am – 12:30 pm 2:00 pm – 4:00 pm</p>	<p><b><u>Lecture:</u></b></p> <ul style="list-style-type: none"><li>• Basic physics of energy and radiation</li><li>• Earth's energy balance model</li><li>• Greenhouse effect</li></ul> <p><b><u>Laboratory Activities:</u></b></p> <ul style="list-style-type: none"><li>• Simple climate model</li></ul> <p><b><u>Assessment:</u></b> Exercises from the lab</p>
<p>27 August 2019 (Tuesday)</p> <p>9:30 am – 12:30 pm 2:00 pm – 4:00 pm</p>	<p><b><u>Lecture:</u></b></p> <ul style="list-style-type: none"><li>• Climate feedback mechanisms</li><li>• Basic physics of the atmosphere and oceans</li><li>• General atmospheric and ocean circulation</li></ul> <p><b><u>Laboratory Activities:</u></b></p> <ul style="list-style-type: none"><li>• Climate feedbacks in the simple climate model</li></ul> <p><b><u>Assessment:</u></b> Exercises from the lab</p>
<p>28 August 2019 (Wednesday)</p> <p>9:30 am – 12:30 pm 2:00 pm – 4:00 pm</p>	<p><b><u>Lecture:</u></b></p> <ul style="list-style-type: none"><li>• Biogeochemical cycles</li><li>• Marine chemistry and carbon cycle</li><li>• Future climate change: observations and predictions</li></ul> <p><b><u>Laboratory Activities:</u></b></p> <ul style="list-style-type: none"><li>• Student presentations on climate change adaptation and mitigation</li></ul> <p><b><u>Assessment:</u></b> Exercises from the lab and presentations</p>
<p>29 August 2019* (Thursday)</p> <p>9:30 am – 12:30 pm 2:00 pm – 4:00 pm</p>	<p>Make up class</p>

<b>Duration</b>	3 whole day sessions (total 15 contact hours)
<b>Date</b>	26 – 28 August 2019 29 August 2019* (make-up class)
<b>Time</b>	26 – 28 August 2019: 9:30 am – 12:30 pm; 2:00 pm – 4:00 pm 29 August 2019*: 9:30 am – 12:30 pm; 2:00 pm – 4:00 pm(make up class)
<b>Venue</b>	The Chinese University of Hong Kong
<b>Enrollment</b>	20
<b>Expected applicants</b>	Students who are promoting to or studying S4-S6 (with background in physics, chemistry or mathematics)
<b>Tuition Fee</b>	HKD 2,800.00
<b>Credit</b>	1 Academy 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 bad weather or other factors.