

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

Summer Courses 2023  
Course Outline

*CUSA1017 Weather and Climate*  
天氣與氣候

**Introduction:** This course will offer basic understanding of how the weather and climate work and how humans make use of our scientific understanding to perform weather forecasts. Different atmospheric phenomena including cloud formation, land-sea breeze, ocean current, atmospheric jet stream and cyclones will be introduced. Demonstrations and hands-on experiments will be available to facilitate understanding. The interpretation of the phenomena in weather charts and how to understand forecast output from models will also be discussed. Studies of climate starting from the perspectives of the climate of Hong Kong to the scale of global climate change will be covered. Furthermore, the quantitative method of examining an atmosphere-ocean cycle, namely the El Niño Southern Oscillation (ENSO), will allow students to look beyond the usual narrative of the ENSO effect.

本課程將提供對天氣和氣候如何運作的基本了解，以及人類如何利用科學知識進行天氣預報。本課程將介紹不同的大氣現象，包括雲的形成、海陸風、海洋流、大氣急流和氣旋。還將提供示範和實驗以促進理解。本課程也將解釋天氣圖表，如何理解模型的預報結果，並涵蓋從香港氣候到全球氣候的變化，以及厄爾尼諾南方振盪的影響。

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

**Organising Unit:** Earth and Environmental Sciences Programme (EESC), Faculty of Science, CUHK

**Teachers:**



**Dr. AU-YEUNG Yee Man Andie (歐陽綺雯博士)**

Lecturer

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### Course Content:

24 August 2023 (Thursday)  9:30 am – 12:30 pm 2:30 pm – 4:30 pm	<p><b><u>Atmospheric and Oceanic Phenomena 大氣與海洋現象 (3 hours by Dr. AU-YEUNG)</u></b></p> <ul style="list-style-type: none"> <li>• Cloud Formation 雲的形成</li> <li>• Land-sea Breeze 海陸風</li> <li>• Ekman Spiral 螺旋流</li> <li>• Ocean Currents 海洋流</li> <li>• Atmospheric Gravity Wave 大氣波動</li> </ul> <p><b><u>Laboratory Experiments 活動 (2 hours by Dr. LI)</u></b></p> <ul style="list-style-type: none"> <li>• Angular Momentum Conservation and the Coriolis Force 動量守恆和科氏力的實驗</li> </ul>
25 August 2023 (Friday)  9:30 am – 12:30 pm 2:30 pm – 4:30 pm	<p><b><u>Basic Weather Systems and Forecast 基本天氣系統和預報 (3 hours by Dr. AU-YEUNG)</u></b></p> <ul style="list-style-type: none"> <li>• History of Modern Weather Prediction 現代天氣預報史</li> <li>• Weather Phenomena in Weather Charts 天氣圖中的天氣現象                         <ol style="list-style-type: none"> <li>a. Fronts 暖鋒和冷鋒</li> <li>b. Typhoon 颱風</li> </ol> </li> <li>• Understanding Forecast Outputs 如何理解天氣預報</li> <li>• Assessment of Weather Prediction Performance 天氣預報的性能評估</li> </ul> <p><b><u>Laboratory Experiments 活動 (2 hours by Dr. LI)</u></b></p> <ul style="list-style-type: none"> <li>• Jet Stream in a Weather Tank 大氣急流的實驗</li> </ul>
26 August 2023 (Saturday)  9:30 am – 12:30 pm 2:30 pm – 4:30 pm	<p><b><u>Climate Statistics 氣候統計 (3 hours by Dr. AU-YEUNG)</u></b></p> <ul style="list-style-type: none"> <li>• Climate of Hong Kong 香港氣候</li> <li>• Global Warming 全球暖化</li> <li>• ENSO 厄爾尼諾南方振盪</li> </ul> <p><b><u>Laboratory Experiments 活動 (2 hours by Dr. LI)</u></b></p> <ul style="list-style-type: none"> <li>• Atmospheric Heat Transport and Cyclones in a Weather Tank 大氣熱傳輸和氣旋</li> </ul>
31 August 2023* (Thursday)  9:30 am – 12:30 pm 2:30 pm – 4:30 pm	Make-up Class

<b>Duration</b>	3 whole day sessions (total 15 contact hours)
<b>Date</b>	24 – 26 August 2023 31 August 2023* (make up class)
<b>Time</b>	9:30 am – 12:30 pm & 2:30 pm – 4:30 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 promoting to or studying S3 – S6
<b>Tuition Fee</b>	HKD 3,200.00
<b>Credit</b>	1 Academy Unit Certificate of completion will be awarded to students who pass the assessment (if applicable) and attain at least 75% attendance.
<b>Grading Methods</b>	Pass or Fail

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