OBJECTIVES:
This course explores the contemporary challenges facing to climate change and air quality studies. It provides students with a fundamental understanding of the concepts and techniques used in climate and air quality modelling and their relevant applications on future mitigation planning.

COURSE SYNOPSIS:
This course introduces students to the fundamental knowledge of the earth’s climate and air quality system. It covers various topics including meteorology, oceanography, physics and chemistry to better understand the dynamics of global climate change and air quality. A set of modelling tools including dynamic/statistical downscaling, pattern scaling and land-use regression will be introduced to the class and allows students to interpret global climate and air quality data (spatial data) for studying local impacts. Students must complete three data analysis exercises and a group project on a contemporary climate change and air quality issue.

LECTURE TOPICS:
• Theoretical fundamentals of optical, radar remote sensing
• Introduction to the earth’s climate system and modelling
• Future climate projection scenarios and its assumptions, limitations, and uncertainties
• Climate and air pollution (aerosols) interaction
• Climate and air pollution extremes
• Climate and air quality data processing techniques (e.g., dynamic/statistical downscaling, pattern scaling and land-use regression)
• Adaption and mitigation strategies

RECOMMENDED READING LIST:
Course Learning Outcomes (CLOs)
After completing this course, students would be able to:

<table>
<thead>
<tr>
<th>Course Assessment Methods</th>
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<tbody>
<tr>
<td>obtain knowledge of the basic concepts, methods, and applications in climate change and air quality</td>
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<td>understand the limitations and uncertainties of climate and air quality data generated from different numerical techniques</td>
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<td>learn and become familiar with the quantitative techniques used to climate change and quality studies</td>
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<td>be able to choose a proper dataset for use in studying the local environmental issue</td>
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Alignment with Programme Learning Outcomes (PLOs)*

*Geography Major Programme Learning Outcomes (PLOs)

In order to meet the demands and challenges in this dynamic and ever-changing world, the Department has designed a series of well-structured and contemporary courses to cater to the different interests of students. Its courses are designed to align with the University’s educational aims which hope to nurture future generations not only with a critical and intellectual mindset, but also with a passion to contribute to society in general.

After completing the programme, Geography Major students should be able to:

PLO1 critically analyse the geographical aspects of the relationship between people and the natural environment;

PLO2 demonstrate and develop an understanding of how these relationships have changed with space and over time;

PLO3 identify, collect and utilize primary and secondary data to investigate and analyse the issues and problems facing people, places and society;

PLO4 integrate, evaluate and communicate information from a variety of geographical and other sources;

PLO5 participate in promoting social, economic and environmental sustainability at the local, regional and global scales; and

PLO6 effectively apply a range of transferable skills in academic, professional and social settings.

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