

2022-23 Term 1

ESSC would like to draw the attention of all science students to one new course, and four introductory-intermediate level courses that are particularly suitable for not only our majors but also non-majors and potential majors interested in Earth system science.

Courses that are particularly suitable for non-majors and potential majors:

ESSC2020 Climate System Dynamics is an excellent introduction to the processes governing our Earth's atmosphere, ocean and biosphere as an integrated system, for all students with basic knowledge in physics, chemistry and mathematics. The course will focus on both quantitative and qualitative aspects of the subject areas, with a strong emphasis on the scientific understanding of what shapes our climate system, how to predict its evolution, and how to address human-caused climate change. See more info below.

ESSC2800 Introduction to Environmental Engineering is a nice introduction to the fundamental physical and chemical principles necessary for understanding our nature and environment. The course will focus on environmental issues such as waste water and air pollution closely related to our daily life. Engineering solutions to tackle these environmental issues will be presented and discussed. See more info below.

ESSC3200 Atmospheric Dynamics covers the basic principles in dynamic meteorology, with a focus on mid-latitude/extratropical synoptic-to-planetary scale circulation systems. It also lays the foundation for students who are interested in other senior-level meteorology courses. Various weather and climate phenomena are used to illustrate dynamical processes. We will also cover extreme weather that wreak havoc in Asia, America and Europe in recent years. See more info below.

ESSC3320 Hydrogeology is a great introduction to the scientific basis governing the hydrological cycle, ground water system and the management of the energy resources in natural and built environments. It covers important topics and introductory concepts about the geosphere and hydrosphere that ESSC2010 and 2020 are not able to cover. No previous background in the subject areas is assumed, but a general science foundation will be helpful. See more info below.

ESSC4210 Land-Atmosphere Interactions and Boundary Layer Meteorology is an in-depth look on how the land surface (including soil, vegetation, urban roads and buildings) strongly influences daily weather phenomena, air pollution episodes, long-term climate (e.g., rainfall, temperature, wind) and ecosystem evolution. This course is strongly recommended for students with sufficient physics/chemistry/mathematics background who are interested in meteorology, climatology and atmospheric chemistry, and those planning to pursue a career in related fields. See more info below.

ESSC4270 Cloud Dynamics provides a fundamental understanding of clouds, ranging from cloud microphysics to their impacts on our climate. Topics on the microscale include phase changes, ice nucleation, aerosol particles, cloud formation and precipitation. Topics on the larger scale include mid latitude storms, tropical cyclones, and the role of clouds in the hydrological cycle and climate.

ESSC4602 Geodynamics strives to understand how the internal force shapes the Earth and other planets. How was the mountain built? Why do volcanoes erupt? What causes earthquakes? To answer those questions, we need to collect measurements, interpret observations, and establish models. This course is strongly recommended if you want to use your mathematics, physics, or computer skills to understand better: plate motion and deformation, heat generation and transfer, the flow of mantle material, rheology of rocks, and so on.

Description of other ESSC courses can also be found below, including **Analytical Methods for Earth and Environmental Sciences, Physics of the Earth, Geomorphology, Cloud Dynamics and Remote Sensing – Principles and Applications.**

If you have any questions about any of ESSC courses, feel absolutely free to contact Prof. Amos Tai (amostai@cuhk.edu.hk).