

GEOG2004 Atmospheric Environment and Global Climate (6 credits)

Course Teacher: Dr J B Li

Objectives

This course provides a general introduction to the atmospheric environment in terms of the processes and interactions which take place and the resulting temporal and spatial manifestations in climate on Earth.

Course Synopsis

This course is divided into three major sections. In the first, the basic characteristics and features of the atmospheric environment are examined from the viewpoint of the basic physical and dynamical processes which occur in the atmosphere and between the atmosphere and the underlying surface. In the second both the spatial and temporal dimensions of the resulting climate are explored at a range of scales to provide an understanding of the link between the processes occurring in the climate system and the diversity of climatic conditions which occur on Earth. In the last section, the interaction between humans and the climate system is explored. Various means of reconstructing and modelling the climate system are examined with a view to understanding the nature of past climates and the variety of potential future climates that might be possible.

Lecture Topics

- Physics and dynamics of the atmosphere
- Climate regionalization
- Global climate: Past, present and future

Assessment

Examination (two hours) 50%; Coursework 50% (consists of bi-weekly lab exercises; mini-presentation and one project).

Learning Outcomes

Knowledge:

- General knowledge about the atmosphere and atmospheric processes
- An understanding of the processes and interactions which take place in the atmosphere
- An understanding of the linkages among these process and interactions and the resulting spatial and temporal patterns of climate on Earth
- An understanding of the past climates, climate modeling and future climate prediction

Skills:

- Critical reading and writing skills
- Development of data analysis/interpretation skills
- Ability to think critically about the way in which the atmosphere works

Recommended Reading List

1. Lutgens, F.K. & Tarbuck, E.J. (2014) *The Atmosphere: An Introduction to Meteorology*, 12th edition. New Jersey: Pearson Prentice Hall.
2. Houghton, J. (2009) *Global Warming: The Complete Briefing*, 4th edition. Edinburgh: Cambridge.
3. Oliver, J. & J. Hidore (2002) *Climatology: An Atmospheric Science*, 2nd edition. Prentice Hall.