

MODULE SPECIFICATION FORM

Module Title: Atmospherics and Climate Change	Level: 6	Credit Value: 20
---	----------	------------------

Module code: SCI612	Cost Centre: GAFS	JACS2 code: F810
---------------------	-------------------	------------------

Semester(s) in which to be offered: 1	With effect from: September 2013
---------------------------------------	----------------------------------

Office use only: To be completed by AQSU:	Date approved: August 2013 Date revised: - Version no: 1
---	--

Existing/New: New	Title of module being replaced (if any):
-------------------	--

Originating Academic area: Chemistry	Module Leader: Amiya Chaudhry
--------------------------------------	-------------------------------

Module duration (total hours) 200	Status: Core
Scheduled learning & teaching hours 60	
Independent study hours 140	

Percentage taught by Subjects other than originating Subject (please name other Subjects):
--

Programme(s) in which to be offered: BSc Geography, Ecology and Environment	Pre-requisites per programme (between levels):
--	--

Module Aims:

To examine:

- The major types of chemical processes in the atmosphere.
- The climate system
- Atmospheric boundary layer climates
- Connections of variations of the climate with the chemical composition of the atmosphere
- Climate system simulation: numerical and computational concepts

Expected Learning Outcomes

At the end of this module, students should be able to:

Knowledge and Understanding:

1. Demonstrate their understanding of the major types of chemical processes in the atmosphere such as ozone depletion, acid rain, aerosols.
2. Critically assess the main factors affecting the Earth's climate and the likely progress of climate change due to anthropogenic activity.
3. Evaluate selected types of climate model in terms of both value and limitations.
4. Critically interpret output from climate modelling / simulations.

Transferable/Key Skills and other attributes:

1. Critical reading
2. Problem solving
3. Use modelling/simulation software

Assessment:

Assessment 1: Literature review based on learning outcome 1&2 assessing the risk of accelerated climate change.

Assessment 2: Using designated software students will investigate the sensitivity of simulated climate data to selected environmental input parameters and produce a written report summarising the outcomes and reflecting upon their significance.

Assessment number	Learning Outcomes to be met	Type of assessment	Weighting	Duration (if exam)	Word count (or equivalent if appropriate)
1	1-2	Literature Review	50%		2000
2	3-4	Report	50%		2000

Learning and Teaching Strategies:

This module will be taught through a combination of lectures and practical sessions using climate modelling software. On-line tutorials will be made available to students in order to train them in use of the climate modelling software.

Syllabus outline:

- Atmospheric radiation and photochemistry
- Chemistry of the stratosphere
- Chemistry of the troposphere
- Climate and variations: possible explanations for present variations
- Boundary layer climates
- Climate modelling. Overview of climate model approaches, and case studies illustrating their value and limitations. Collection and analysis of climate data from computer simulations.

Bibliography:

Essential reading:

- Neelin, J.D. (2011) *Climate Change and Climate Modeling*. Cambridge: Cambridge University Press.
- Seinfeld, J.H. and Pandis, S.N. (2006) *Atmospheric Chemistry and Physics: From Air Pollution to Climate Change*. Wiley
- Barry, R.G. and Chorley, R.J. (2009) *Atmosphere, Weather and Climate* 9th Ed. Routledge

Other indicative reading:

- McGuffie, K. and Henderson-Sellers, A. (2005) *A Climate Modelling Primer*. 3rd ed. Chichester: John Wiley and Sons Ltd.

Electronic Resources:

Atmospheric Environment / Elsevier
Science of The Total Environment / Elsevier
Global and Planetary Change / Elsevier

and other Internet and journal sources as directed by tutor.