

## MSc/Diploma in Environmental Protection and Management

**Core course:** Atmospheric Quality and Global Change 2008 (Semester 1)  
**Course Organiser:** Bob Rees, **Location:** Lecture Theatre E

This course begins by outlining the current knowledge of and concerns regarding atmospheric quality and global climate change. Sources of potentially harmful gaseous emissions and acidifying pollutants from industry, transport and 'natural' emissions from the soil are discussed along with their effects on ecosystems. Mitigation options for reducing emissions and their effects by changing land use, transport and urban infrastructure and by using renewable energy are considered.

Week 1 25 Sept	Introduction. Land Atmosphere interactions, the greenhouse effect, impacts of climate change; sources and sinks of greenhouse gases, (BR)
Week 2 2 Oct	Modelling GHG emissions. The use of different modelling approaches at different scales. Parameterisation and validation. The challenge of upscaling (KT/BR)
Week 3 9 Oct	The global carbon cycle, land atmosphere exchange, land use change, carbon footprinting (BR)
Week 4 16 Oct	
Week 5 23 Oct	<b>9 am start.</b> Observed climate change, the greenhouse effect and human influence on climate, natural climate variability, modelling the climate system, predicting future climate. (DS) Field visit to research work at the Bush Estate. (BR)
Week 6 30 Oct	Traffic management for pollution reduction (DR)
Week 7 6 Nov	Trace gas exchange, soil processes contributing to greenhouse gas production, affects of land management, mitigation. Acid rain and acidification; production and consumption of acidity in the environment. Impacts of nitrogen deposition on forests and semi-natural habitats (BR/LS)
Week 8 13 Nov	Renewable energy. Biomass and hydro power, solar and wind power Afternoon field excursion to Blacklaw dep 13.15 PWB (DR/BR)
Week 9 20 Nov	Air pollution monitoring in the City of Edinburgh, Air pollution and policy; Kyoto and beyond (BR)
Week 10 27 Nov	Student Presentations (BR, BB, DR)
Week 11 4 Dec	Revision
Week 12	Exam

**Assessment:** Half of the module mark is provided by the final exam, the other half comes from an essay (3000 words) in report format to be submitted in week 10 (37.5% of the total module mark). A short description of the scope of the essay and its title should be discussed with one of the course tutors. A range of topics will be provided in week 2. Oral presentations (15 minutes) with an abstract (A4 page) of the essay (12.5% of the total module mark).

**Time and place.** Lectures take place between 9.30 and 13.00 on Thursdays in the Agriculture building at KB (usually in Lecture Theatre E)

**Contributors:** Most of the lecturing staff also function as research scientists and advisors, and have extensive experience of environmental pollution problems at local, national and international levels:

Dr Bob Rees	Environmental Scientist, SAC
Dr David Stevenson	Meteorologist, University of Edinburgh
Mr David Rackham	Lecturer in Environmental Science and Engineering, SAC
Dr Bruce Ball	Soil Scientist, SAC
Dr Lucy Sheppard	Research Scientist, Centre for Ecology and Hydrology