ENVST-UA 9226 Climate Change

Semester: FALL 2015
Class code: ENVST-UA 9226
Instructor Details: Lisa Weber
Lisa.weber@nyu.edu

Class Details
Climate Change
Thursday 2-5pm
Location to be confirmed.

Prerequisites

Class Description
Climate change is among the most complex and challenging problems that we have confronted as a civilization, but the responses and impacts will vary largely across space and the global population. This course is designed to give you an overview of the scientific basis of climatic change, and will expose you to multiple facets of a very interdisciplinary and encompassing field. You will be introduced to the physical science of our climate system, the contributing system components, and the basic mechanisms that govern how the climate system responds to drivers of change. We’ll then explore climate change from multiple perspectives: paleoclimatic change, recent historical variability and change, future climate projections as well as social and economic issues. Each session will start with a discussion about a scientific paper (or parts of the IPCC report) followed by a one hour lecture and practical work at the end of each session. The practical work will have large components of learning scientific writing and presentation.

Desired Outcomes

Assessment Components
Your grade will be based on regular homework assignments, one midterm exam, a final project and a final exam.
Contribution to the grade: Assignments (20%), Midterm (20%), Final Project (30%), Final Exam (30%).

The assignments will be largely (but not only) consist of scientific paper reviews which will be presented by individual students each week and then discussed at the beginning of each meeting. The
Final Project will include a written document in form of a scientific paper and a short presentation.

Failure to submit or fulfil any required course component results in failure of the class. Failure to complete a reading assignment by the listed due date and time will result in a 0 for that assignment.

Exams will be excused only for medical or family emergencies. I need to be notified by phone or email before the exam time. An unexcused absence from an exam will be calculated as 0% for that particular test. A make-up test will be made available if a legitimate excuse is presented.

### Assessment Expectations

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<thead>
<tr>
<th>Grade</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>A</td>
<td>90-100 %</td>
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<tr>
<td>B</td>
<td>80-89 %</td>
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<tr>
<td>C</td>
<td>70-79 %</td>
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<tr>
<td>D</td>
<td>65-69 %</td>
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<tr>
<td>F</td>
<td>below 65 %</td>
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### Required Text(s)

TBA

### Supplemental Text(s) (not required to purchase as copies are in NYU-L Library)

Internet Research Guidelines

### Additional Required Equipment

### Session 1

03.09.2015

**Lecture: Introduction.** The scientific consensus and popular misconceptions.

**Practical 1:** Choosing the individual topics for the Final Project. The overall topic of the Final Projects is Climate Change in London. Students will use the internet to research topics.

**Practical 2:** How to give a short presentation. Each student will have to give one short presentation over the semester to present a scientific paper at the beginning the class each week. This practical is designed to give the student the basics for it and will be revisit after each presentation.
Session 2
10.09.2015

**Lecture: Earth’s Climate System:** How climate depends on interactions between atmosphere, hydrosphere, biosphere, and crust of the Earth. The global wind system. Poleward transport of heat by the atmosphere.

**Practical:** How to write a scientific paper. Student will start structuring their Final Project paper and start writing an introduction (Computer lab).

**Paper Discussion:** Paper of the week (TBA)

Session 3
17.09.2015


**Practical:** Scientific citation. How to use software to set up a personal bibliography file.

**Paper Discussion:** Paper of the week (TBA)

Session 4
24.09.2015


**Practical:** Understanding scientific diagrams, charts and figures. Figures from previous lectures will be studied in more detail and difference and reasons for specific diagrams examined.

**Paper Discussion:** Paper of the week (TBA)

Session 5
01.10.2015

Global versus regional sea level rise.

Practical: Using ArcGIS to examine the extends of Sea Level Rise in London

Paper Discussion: Paper of the week (TBA)

Session 6
08.10.2015


Practical: Review for Midterm

Paper Discussion: Paper of the week (TBA)

Session 7
15.10.2015

MIDTERM

Session 8
22.10.2015

Palaeoclimate: Climate variation across time scales. The faint young Sun and evolution of the atmosphere. The role of weathering and long-term carbon cycles – impact to regional and global climates. The Earth’s orbital cycles as “pacemaker” of ice ages (Milankovitch theory). Evidence from marine sediments and glacial ice cores. Discovery of the ice ages.

Practical: TBA

Paper Discussion: Paper of the week (TBA)

Session 9
29.10.2015

Field Trip (TBA)

Session 10
12.10.2015

Climate Models and Predictions: Earth systems models and computer simulations, their applications and uncertainties. Multi-model climate projections for a range of future emissions scenarios. The implications for “Business as usual”: more frequent and severe storms and droughts, loss of Arctic ice,
and rising sea level.

**Practical:** Using a simple model to predict climate change. Students will use a simple computer model and will run a few own climate predictions.

Paper Discussion: Paper of the week (TBA)

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**Session 11**
19.10.2015

**Environmental Impact of Climate Change.** Extreme weather, storm surges, hurricanes, fresh water shortage, droughts and, floodings. Shifting climate zones will disrupt land and ocean ecosystems, species survival, agriculture and industry, and human health. Chronic drought and rising sea level would drive environmental refugees and conflict.

**Practical:** TBA

Paper Discussion: Paper of the week (TBA)

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**Session 12**
26.10.2015

**Lecture: Mitigation and Adaptation.** Sources of energy and energy efficiency. Renewable energy. Fission and fusion. Adaptation to sea level rise, freshwater shortage and food shortage. Challenges and opportunities. Rising population.

**Practical:** Making a scientific poster. Students will produce a poster to present the key findings of their Final Projects.

Paper Discussion: Paper of the week (TBA)

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**Session 13**
03.12.2015

**Lecture: Geoengineering.** (Possible Guest Lecturer, TBA). Carbon capture and sequestration. Ocean iron fertilisation, air capture, solar radiation management. Risks, costs and feasibility.

**Practical:** Exam Review

Paper Discussion: Paper of the week (TBA)
Students presentations: Students will present their final projects in form of a poster.

Final Exam

The usage of mobile phones during class and eating lunch is not allowed.

Dr Lisa Weber has a PhD in Marine Sciences, in addition to a first class degree and an MSc equivalent in Physical Geography. Her most recent job is Associate Lecture for Oceanography at the Open University. Prior to that she worked as postdoctoral researcher at the National Oceanography Centre in Southampton for almost 10 years. Her entire education at University and subsequent jobs have revolved around environmental and marine issues related to climate change. Her research is focused on the biogeochemical cycles of nutrients in marine ecosystem models, which is an important aspect of the global carbon cycle and climate change research.
NYU LONDON ACADEMIC POLICIES

Academic Integrity
At NYU, a commitment to excellence, fairness, honesty, and respect within and outside the classroom is essential to maintaining the integrity of our community. By accepting membership in this community, students take responsibility for demonstrating these values in their own conduct and for recognizing and supporting these values in others.

At NYU London, students will submit electronic copies of their written work to Turnitin via their NYU Classes course site. Instructions will be provided to you separately.

Late Submission of Work
Written work due in class must be submitted during the class time to the professor. Late work should be submitted in person to a member of NYU London staff in the Academic Office (Room 308, 6 Bedford Square) during office hours (Mon – Fri, 10:30 – 17:30). Please also send an electronic copy to academics@nyu.ac.uk for submission to Turnitin.

Work submitted within 5 weekdays after the submission time without an agreed extension receives a penalty of 10 points on the 100 point scale.

Written work submitted more than 5 weekdays after the submission date without an agreed extension fails and is given a zero.

Please note end of semester essays must be submitted on time.

Attendance Policy
Study abroad at Global Academic Centres is an academically intensive and immersive experience. Learning in such an environment depends on the active participation of all students. As classes typically meet once a week, even a single absence can cause a student to miss a significant portion of a course.

To ensure the integrity of this academic experience, class attendance is mandatory and unexcused absences will be penalized with a two percent deduction from the student’s final course grade. Students are responsible for making up any work missed due to absence. Repeated absences in a course may result in failure.

How to report an absence
Absences from class must be reported to NYU London administrative staff using the online Absence Form: http://tinyurl.com/nyulabdance

Absences can ONLY be excused if they are reported using this form. Students should NOT approach their class instructor for an excused absence. However, students should contact their class instructor to catch up on missed work.

Medical absences
If you are unable to attend a class due to ill-health, you must provide details of your illness and class(es) missed to NYUL staff using the online Absence Form WITHIN SEVEN DAYS of your return to class.

Please do not use the form to report a medical emergency or to request urgent assistance. In a medical emergency call 999 and ask for an ambulance. NYU London staff are available to offer support, whatever time of day. If you would like to speak to a member of staff urgently to request support with a medical problem, please call 0800 316 0469, selecting option 2.

Non-medical absences
If you have to miss class for an unavoidable, non-medical reason you must provide details to NYUL staff using the online Absence Form at least **SEVEN DAYS PRIOR** to the date(s) in question. Examples of valid non-medical reasons are as follows: religious holiday; family wedding; scholarship competition; family emergency. If in doubt please speak to a member of Academics staff or email academics@nyu.ac.uk. Failure to provide requested documentation for these types of absences will result in the absence remaining unexcused.

Further information regarding absences

**NYU London staff carefully monitor student attendance and absence records.** In most cases full completion of the online Absence Form will be sufficient to excuse your absence. However, in certain circumstances, you will be asked to provide additional information/verification before it can be excused. If we notice that you have multiple absences you will be contacted to arrange a meeting with a member of staff.

**Unexcused absences from exams are not permitted and will result in failure of the exam.** Students may not take an exam before or after other students in the class, and may not leave the programme before all course work has been submitted.

Please refer to the NYU Wikis Page for the full absence policy: [https://wikis.nyu.edu/x/awRgAw](https://wikis.nyu.edu/x/awRgAw)

**Grade conversion**

NYU in London uses the following scale of numerical equivalents to letter grades:

- A=94-100
- A-=90-93
- B+=87-89
- B=84-86
- B-=80-83
- C+=77-79
- C=74-76
- C-=70-73
- D+=67-69
- D=65-66
- F=below 65

Where no specific numerical equivalent is assigned to a letter grade by the class teacher, the midpoint of the range will be used in calculating the final class grade (except in the A range, where 95.5 will be used).

**Grading Policy**

NYU in London aims to have grading standards and results in all its courses similar to those that prevail at Washington Square.