

# CLIM 101: GLOBAL WARMING: WEATHER, CLIMATE AND SOCIETY

## Fall 2017 - Syllabus

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<b>Teaching Assistant:</b>	TBD ( <a href="mailto:TBD@gmu.edu">TBD@gmu.edu</a> )
<b>Class Schedule:</b>	Tuesday & Thursday 10:30 - 11:45am (Sec. 1: Room: 129 Planetary Hall)
<b>Office Hours:</b>	Tuesday, 12 noon – 1:30 pm (284 Research Hall)
<b>Important Dates:</b>	10 October 2017                      No Class (observance of Columbus Day) 17 October 2017                      Mid-term Examination 24 November 2017                    No Class (Thanksgiving) 14 December 2017                    Final Examination

### Course Homepage:

Blackboard: <http://mymasonportal.gmu.edu>

\* All lecture notes, assignments and reading materials will be posted.

### Textbooks, Recommended and Supplementary Reading Materials:

- Required Reading:
  1. **(JH)** Global Warming – The Complete Briefing (fifth edition) by John Houghton (available in the bookstore; Gateway Library<sup>1</sup>)
  2. **(KD)** The Atlas of Climate Change (Rev. 2008) by Kirstin Dow and Thomas E. Downing (available in the bookstore)
  3. **(AL)** Climate Diplomacy, by Andrew Light (posted on [mymasonportal.gmu.edu](http://mymasonportal.gmu.edu))
  4. **(EM)** Increasing Public Awareness and Facilitating Behavior Change: Two Guiding Heuristics, by Ed Maibach (posted on [mymasonportal.gmu.edu](http://mymasonportal.gmu.edu))
- Recommended Reading:
  1. The Science and Politics of Global Climate Change by Andrew Dessler and Edward Parson ([http://www.amazon.com/Science-Politics-Global-Climate-Change/dp/0521737400/ref=sr\\_1\\_1?s=books&ie=UTF8&qid=1337717310&sr=1-1](http://www.amazon.com/Science-Politics-Global-Climate-Change/dp/0521737400/ref=sr_1_1?s=books&ie=UTF8&qid=1337717310&sr=1-1))
  2. Merchants of Doubt by Naomi Oreskes and Erik Conway ([http://www.amazon.com/Merchants-Doubt-Handful-Scientists-Obscured/dp/1608193942/ref=tmm\\_pap\\_title\\_0/180-9063339-3708331](http://www.amazon.com/Merchants-Doubt-Handful-Scientists-Obscured/dp/1608193942/ref=tmm_pap_title_0/180-9063339-3708331))
  3. Dire Predictions by Michael Mann and Lee Kump (<http://www.amazon.com/Dire-Predictions-2nd-Edition-Understanding/dp/1465433643>)
- Supplementary Reading Materials: Students should refer to Course Homepage each week

### Course Description:

Climate change is one of the defining issues of our time. This course provides a survey of weather and climate processes, and the global and regional impacts of human-induced changes in carbon dioxide and other greenhouse gases in the atmosphere. The course will focus on the phenomena of climate variability and change, both observed during the past century and projected for the next century, that have impacts on human society and natural ecosystems. The course provides sufficient scientific background to enable students to critically examine arguments about climate change and possible solutions being discussed by policymakers and the public at large.

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<sup>1</sup> On reserve in the Gateway Library at the Johnson Center - may be charged out for 2 hour time periods and, if there is no one else awaiting use of the book, the book can be renewed.

This Mason Core course satisfying the Natural Science requirement will also review the roles of science, politics, international negotiations and the media in the current debate on what to do about climate change. The classes will consist of lectures, guest lectures, movies, in-class discussion and student presentations. Students will have an opportunity to survey recent literature on the impacts of climate change in Virginia to advise the Governor on risks and strategies for adaptation and on various policy alternatives and commentaries and review policy and commentary documents relating to climate change policies and solutions. Students also will have an opportunity to formally debate whether global warming is a fact or an alternative fact and whether reducing greenhouse gas emissions will save the planet or kill jobs.

### Course Requirements:

1. *Reading*: The primary sources are selections from the textbooks and supplementary readings. Selected articles will be provided. Students are expected to stay current on readings and lectures.
2. *Homework* (30% of grade): Five sets of homework with questions based on readings and lectures. The homework should be your own work, not done in collaboration with other students.
3. *Attendance* (15% of grade): Attendance will be recorded at each class session. Unannounced in-class quizzes will be given from time to time with questions based on the readings.
4. *Mid-term examination* (20% of grade): A test to evaluate students' acquisition and comprehension of material discussed in the first half of the course.
5. *Group oral presentation* (15% of grade): Students prepare reports on topics selected in consultation with the instructor. Students will make group oral presentations. NOTE: This requirement is subject to class discussion and change.
6. *Final examination* (20% of grade): A test to evaluate students' acquisition and comprehension of material discussed during entire semester.
7. *Extra credit*: Up to 5% extra credit will be given for class participation (e.g., student debate).

### Detailed Course Schedule (subject to minor adjustment)

Date	Topic	Reading(s)	Course work / activity
29 Aug	<b>Introduction to CLIM101: Our Place in the Universe</b>		Homework (HW) 1 & 5, term project topics handouts
31 Aug	<b>10 Themes of CLIM 101 (T1-T10)</b>	JH Chapter 1	
05 Sep	<b>T3: Global Warming and the Greenhouse Effect</b>	JH Chapters 2 & 3	<b>Term project topic choices due</b> (last day to drop/add)
07 Sep	<b>T1 &amp; T4: Earth's Current and Past Climate</b>	JH Chapter 4	Term project topics, groups assigned
12 Sep	<b>T5: Predicting Earth's Future Climate</b>	JH Chapters 5 & 6	
14 Sep	<i>An Inconvenient Truth</i>	<a href="https://en.wikipedia.org/wiki/An_Inconvenient_Truth">https://en.wikipedia.org/wiki/An_Inconvenient_Truth</a>	Movie viewing
19 Sep	<b>T2: Climate, Ecosystems and Human Society</b>	JH Chapter 8	<b>DUE: HW 1</b> ; HW 2 handout
21 Sep	<b>T6: Global Impacts and Consequences of Climate Change</b>	JH Chapter 7	
26 Sep	<b>T6: Regional Impacts and Consequences of Climate Change</b>	JH Chapter 7	
28 Sep	<b>T8: Are Humans Responsible for Climate Change?</b>	JH Chapters 8 & 9	
03 Oct	<b>T8: Detection and Attribution of Climate Change</b>	JH Chapter 9	
05 Oct	<b>T7: The Science &amp; US Politics of Climate Change</b>		
10 Oct	<i>NO CLASS (Columbus Day observed)</i>		NO CLASS
12 Oct	<b>T7: The Roles of Science, Politics, &amp; Media in Shaping Public Opinion About Global Warming</b>	EM: Two Heuristics	Guest lecturer – E. Maibach plus ... Review for Mid-term
17 Oct	<b>MID-TERM EXAMINATION</b>		<b>In-class exam</b>
19 Oct	<b>Presentation Groups – In-class meeting time</b>		<b>DUE: HW 2</b> ; HW 3 handout; <b>Group meetings</b>
24 Oct	<b>T10: Climate Change Policy in the US and VA</b>		

26 Oct	<b>T7: Opposing Views of Global Warming</b>		<b>Student debate #1</b>
31 Oct	<b>T9: Climate Change Solutions: Adaptation and Mitigation</b>	JH Chapter 11	
02 Nov	<b>T10: International Mitigation Policy: History and Perspectives</b>	AL: Climate Diplomacy JH: Chapter 10	Guest lecturer – A. Light
07 Nov	<b>Presentation Groups – In-class meeting time</b>		<b>Group meetings; DUE: HW 3; HW 4 handout</b>
09 Nov	<b>T4: Global Biodiversity: Past, Present and Future</b>	JH: Chapter 12 (&8)	Guest lecturer – T. Lovejoy
14 Nov	<b>T7: Opposing Views of Global Warming</b>		<b>Student debate #2</b>
16 Nov	<b>Group Presentations</b>		<b>Group presentations</b>
21 Nov	<b>Group Presentations</b>		<b>Group presentations</b>
23 Nov	<i>NO CLASS (Thanksgiving)</i>		
28 Nov	<b>Group Presentations</b>		<b>Group presentations</b>
30 Nov	<b>Group Presentations</b>		<b>Group presentations; DUE: HW 4 &amp; 5</b>
05 Dec	<b>Group Presentations</b>		<b>Group presentations</b>
07 Dec	<b>Review for Final Exam</b>		
14 Dec	<b>FINAL EXAMINATION</b>		<b>In-class exam</b>

### Goals and Learning Outcomes:

The course will:

1. *Promote student interest in natural science by engaging students and fostering curiosity.* Students will gain an in-depth understanding of the scientific underpinnings of how weather and climate affect economies and societies at both global and regional scales. The particular emphasis on the global warming debate will stimulate students to be better informed about potential problems such as sea level rise, trends in hurricane frequency and intensity, incidence and severity of droughts and the occurrence of extreme weather events. The importance of the issues is expected to encourage student interest in potential careers in natural science research.
2. *Enable students to apply scientific knowledge and reasoning to personal, professional and public decision-making.* By focusing on a series of provocative questions that depend on scientific information and have broad implications for global society, the course will encourage students to question the assumptions made and critically examine public policy decisions about the response to changes in weather and climate.

The course will also address Mason Core Natural Sciences learning outcomes:

1. *Understand how scientific inquiry is based on investigation of evidence from the natural world, and that scientific knowledge and understanding evolves based on new evidence and differs from personal and cultural beliefs.* Students will be presented with a wealth of evidence from observations of Earth and from models of the Earth system that quantify how Earth's climate behaves and how it changes, including a brief history of how that information has been gathered and interpreted.
2. *Recognize the scope and limits of science.* Uncertainty, both in measurements of global quantities and in representations of relevant physics, chemistry and biology in Earth system models, will be presented and emphasized. Ways of conducting scientific inquiry to measure, reduce and manage uncertainty will be described.
3. *Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges.* At least half the course will be devoted to the

science and politics of global warming, why there is a debate, and how the debate can be influenced by scientific information.

4. *Evaluate scientific information.* Through their team presentations, and formal debates, students will have the opportunity to challenge the available scientific information and how it is used to frame policy decisions.

### **Academic Integrity:**

Mason is an Honor Code university; please see the University Catalog for a full description of the code and the honor committee process. The principle of academic integrity is taken very seriously and violations are treated gravely. What does academic integrity mean in this course? Essentially this: when you are responsible for a task, *you* will perform that task. When you rely on someone else's work in an aspect of the performance of that task, you will give full credit in the proper, accepted form. Another aspect of academic integrity is the free play of ideas. Vigorous discussion and debate are encouraged in this course, with the firm expectation that all aspects of the class will be conducted with civility and respect for differing ideas, perspectives, and traditions. When in doubt (of any kind), please ask for guidance and clarification. As in many classes, there will be a project in this class designed to be completed within small study groups. With collaborative work, the names of all the participants should appear on the work. Collaborative projects may be divided up so that individual group members complete portions of the whole, provided that group members take sufficient steps to ensure that the pieces conceptually fit together in the end product.

*Please note:* The homework for this course should be your own work, not done in collaboration with other students. If you have questions about the homework, please see me or send email ([ikinter@gmu.edu](mailto:ikinter@gmu.edu)).

### **Diversity:**

George Mason University promotes a living and learning environment for outstanding growth and productivity among its students, faculty and staff. Through its curriculum, programs, policies, procedures, services and resources, Mason strives to maintain a quality environment for work, study and personal growth.

An emphasis upon diversity and inclusion throughout the campus community is essential to achieve these goals. Diversity is broadly defined to include such characteristics as, but not limited to, race, ethnicity, gender, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity will help promote a culture of inclusion and belonging, and an environment where diverse opinions, backgrounds and practices have the opportunity to be voiced, heard and respected.

The reflection of Mason's commitment to diversity and inclusion goes beyond policies and procedures to focus on behavior at the individual, group and organizational level. The implementation of this commitment to diversity and inclusion is found in all settings, including individual work units and groups, student organizations and groups, and classroom settings; it is also found with the delivery of services and activities, including, but not limited to, curriculum, teaching, events, advising, research, service, and community outreach.

Acknowledging that the attainment of diversity and inclusion are dynamic and continuous processes, and that the larger societal setting has an evolving socio-cultural understanding of diversity and inclusion, Mason seeks to continuously improve its environment. To this end, the University promotes continuous monitoring and self-assessment regarding diversity. The aim is to incorporate

diversity and inclusion within the philosophies and actions of the individual, group and organization, and to make improvements as needed.

**GMU Email Accounts:**

Students must use their Mason email accounts to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.

**Disability Accommodations:**

If you are a student with a disability and you need academic accommodations, please see me and also contact the Office of Disability Services (ODS) at 993-2474. All academic accommodations must be arranged through the ODS. <http://ods.gmu.edu>

**Other Useful Campus Resources:**

Mason has several support services for students. Please go to <http://ctfe.gmu.edu/teaching/student-support-resources-on-campus/> for a directory of services.

**University Policies:**

The University Catalog, <http://catalog.gmu.edu>, is the central resource for university policies affecting student, faculty, and staff conduct in university academic affairs. Other policies are available at <http://universitypolicy.gmu.edu/>. All members of the university community are responsible for knowing and following established policies.