

CLIM 101: GLOBAL WARMING: WEATHER, CLIMATE AND SOCIETY

Fall 2019 - Syllabus

Instructors:	James L. Kinter (office: 284 Research Hall, e-mail: ikinter@gmu.edu) J. Shukla (office: 105 Research Hall, email: jshukla@gmu.edu)
Class Schedule:	Sec 001: Tuesday & Thursday 10:30 - 11:45am (Room: 129 Planetary Hall) Sec 002: Tuesday & Thursday 1:30 - 2:45pm (Room: 1006 David King Hall)
Office Hours:	Tuesday, 12 noon – 1:15 pm (284 Research Hall)
Important Dates:	9 September 2019 Last day to drop with 100% tuition refund 10 October 2019 Mid-term Examination 15 October 2019 No Class (Fall Break) 26 November 2019 No Class (Thanksgiving) 11-18 December 2019 Final Examination (date will be finalized in second week of semester)

Course Homepage:

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

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

Textbooks, Recommended and Supplementary Reading Materials:

1. Required Reading:
 1. **(JH) Global Warming – The Complete Briefing** (5th edition) by John Houghton (available in the bookstore; Gateway Library¹)
2. 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)
 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)
 3. **Drawdown** by Paul Hawken (ed.) (<https://www.amazon.com/Drawdown-Comprehensive-Proposed-Reverse-Warming/dp/0143130447/>)
 4. **The Atlas of Climate Change** (Rev. 2008) by Kirstin Dow and Thomas E. Downing (available in the bookstore)
 5. **Dire Predictions** by Michael Mann and Lee Kump (<http://www.amazon.com/Dire-Predictions-2nd-Edition-Understanding/dp/1465433643>)
3. 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 concentrations of carbon dioxide and other greenhouse gases in the atmosphere. The course will focus on the phenomena of climate variability and change, both observed in the past 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.

¹ 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 debates. Students will have an opportunity to survey recent literature on the impacts of climate change in Virginia and beyond, the risks and strategies for adaptation, and the various policy alternatives and technical solutions for mitigating the harmful effects of climate change. Students also will have an opportunity to formally debate whether humans are really causing Earth's climate to change 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* (35% of grade): Biweekly 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* (25% of grade): A test to evaluate students' acquisition and comprehension of material discussed in the first half of the course.
5. *Final examination* (25% of grade): A test to evaluate students' acquisition and comprehension of material discussed during entire semester.
6. *Extra credit*: Up to 5% extra credit will be given for class participation (e.g., student debate).
7. *Cell phones*: Students are welcome to take notes in class on laptop computers or tablets. Students are expected to refrain from cell phone use during class – those students who find it difficult to avoid cell phone use during class are encouraged to sit near the front of the classroom.

Final grades will be posted on Friday, 20 December 2019.

Detailed Course Schedule (subject to minor adjustment)

<i>Date</i>	<i>Topic</i>	<i>Reading(s)</i>	<i>Work / activity / handouts</i>
27 Aug	Introduction to CLIM101: Our Place in the Universe	Syllabus	Questionnaire; Homework (HW) 1 & HW 7 online
29 Aug	10 Themes of CLIM 101	JH Chapter 1	
03 Sep	What is the Climate of the Earth?	JH Chapters 4	Harvard video
05 Sep	Student Debate: Are humans causing global heating?	NA	Set final exam date
10 Sep	Global Warming and the Greenhouse Effect	JH Chapter 2 & 3	
12 Sep	<i>An Inconvenient Truth</i>	https://en.wikipedia.org/wiki/An_Inconvenient_Truth	HW 2 online; HW 1 DUE
17 Sep	Earth Current Climate – What's Different Now?	JH Chapter 4	
19 Sep	Predicting Earth's Future Climate	JH Chapters 5 & 6	
24 Sep	Earth's Past Climate	JH Chapter 4	
26 Sep	Global Impacts and Consequences	JH Chapter 7	HW 3 online; HW 2 DUE
01 Oct	Regional Impacts and Consequences	JH Chapter 7	
03 Oct	Discussion		
08 Oct	Review for Mid-term exam	JH Chapters 1-7; lecture notes	

10 Oct	MID-TERM EXAMINATION		In-class exam
15 Oct	<i>NO CLASS (Columbus Day observed)</i>		NO CLASS
17 Oct	Communicating Climate Change		Guest Lecture - TBD; HW 4 online; HW 3 DUE
22 Oct	Impacts on Virginia	JH Chapter 7	
24 Oct	Climate, Ecosystems and Human Society	JH Chapter 8	
29 Oct	Are Humans Responsible for Climate Change?	JH Chapter 8 & 9	
31 Oct	International Mitigation: History & Perspectives		Guest Lecture – Light; HW 5 online; HW 4 DUE
05 Nov	Detection and Attribution of Climate Change	JH Chapter 9	
07 Nov	Discussion		
12 Nov	The Science & US Politics of Climate Change	JH: Chapter 10	
14 Nov	Debunking Climate Change Myths	http://skepticalscience.com	Guest Lecture – Cook; HW 6 online; HW 5 DUE
19 Nov	Climate Change Policy in the US and Virginia		
21 Nov	Climate Change Solutions: Adaptation and Mitigation	JH: Chapter 11	
26 Nov	Energy, Renewables and Social Cost of Carbon	JH: Chapter 12	HW 6 DUE
28 Nov	<i>NO CLASS (Thanksgiving)</i>		
03 Dec	Student Debate: Will reducing GHG emissions save the Earth or destroy the economy?		Questionnaire
05 Dec	Review for Final Exam	JH Chapters 1-12; lecture notes	Student course ratings; HW 7 DUE
10 Dec	Reading Day		
17 Dec	FINAL EXAMINATION	JH Chapters 1-12; lecture notes	In-class exam

Goals and Learning Outcomes:

The course will:

1. *Promote student interest in natural science by engaging students and fostering curiosity.* Students will gain an 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 policy 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 regional, national and global society, the course will

encourage students to question assumptions and critically examine public policy decisions about the preparations for and 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: a) evolves based on new evidence, and b) differs from personal and cultural beliefs.
2. Recognize the scope and limits of science.
3. Recognize and articulate the relationship between the natural sciences and society and the application of science to societal challenges (e.g., health, conservation, sustainability, energy, natural disasters, etc.).
4. Evaluate scientific information (e.g., distinguish primary and secondary sources, assess credibility and validity of information).
5. Participate in scientific inquiry and communicate the elements of the process, including: a) making careful and systematic observations, b) developing and testing a hypothesis, c) analyzing evidence, and d) Interpreting results.

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. It is expected that students adhere to the George Mason University Honor Code as it relates to integrity regarding coursework and grades. The Honor Code reads as follows: “To promote a stronger sense of mutual responsibility, respect, trust, and fairness among all members of the George Mason University community and with the desire for greater academic and personal achievement, we, the student members of the University Community have set forth this: Student members of the George Mason University community pledge not to cheat, plagiarize, steal and/or lie in matters related to academic work.” More information about the Honor Code, including definitions of cheating, lying, and plagiarism, can be found at the Office of Academic Integrity website at <http://oai.gmu.edu>

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).

Diversity and Inclusion:

This course will be conducted in a manner that is consistent with the George Mason University policy on non-discrimination (<https://universitypolicy.gmu.edu/policies/non-discrimination-policy/>), and the policy prohibiting sexual and gender-based harassment and inter-personal violence (<https://universitypolicy.gmu.edu/policies/sexual-harassment-policy/>). The instructors in this course are committed to being mindful of diversity, one of Mason’s core values. The 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:

Disability Services at George Mason University is committed to providing equitable access to learning opportunities for all students by upholding the laws that ensure equal treatment of people with disabilities. If you are seeking accommodations for this class, please first visit <http://ds.gmu.edu/> for detailed information about the Disability Services registration process. Then please discuss your approved accommodations with me. Disability Services is located in Student Union Building I (SUB I), Suite 2500. Email:ods@gmu.edu | Phone: (703) 993-2474.

Other Useful Campus Resources:

Mason has several support services for students. Please go to <https://steamscenter.gmu.edu/knowledge-center/knowning-mason-students/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.