CLIM 101: GLOBAL WARMING: WEATHER, CLIMATE AND SOCIETY

Fall 2021 – Syllabus – Sec 001 (In Person)

(updated 21 July 2021)

Instructors: James L. Kinter (office: 284 Research Hall, e-mail: ikinter@gmu.edu)
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Class Schedule: Tuesday & Thursday 10:30 - 11:45am EST (Lecture Hall #1)

Office Hours: Tuesday, 11:45 am – 1:00 pm

Important Dates:

7 September 2021	Last day to drop with 100% tuition refund
7 October 2021	Mid-term Examination
12 October 2021	No Class (Fall Break)
25 November 2021	No Class (Thanksgiving)
14 December 2021	Final Examination (10:30 am – 1:15 pm EST)
17 December 2021	Final grades posted

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.

This Mason Core course that satisfies 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. Lectures will include opportunities for interaction, including instant polls, question and answer sessions in which students are asked questions or may ask questions to the instructors. 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 questions relating to the scientific and political aspects of climate change.

Technology Requirements:

This course is being offered in person, which means that class sessions will take place in the designated location at the scheduled time. Activities and assignments in this course will use the Blackboard learning system, (*https://mymason.gmu.edu*), where all lecture notes, assignments and reading materials will be posted. While in the classroom, please be respectful of your peers and your instructor and do not engage in activities that are unrelated to the class.

All course materials posted to Blackboard or other course site are private; by federal law, any materials that identify specific students (via their name, voice, or image) must not be shared with anyone not enrolled in this class.

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 – **online only**; Gateway Library[1])
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 – **online only**)
    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 Blackboard page each week

Course Requirements:

1. *Reading*: The primary sources are selections from the textbooks and supplementary readings. Selected articles will be provided via Blackboard. Students are expected to stay current on readings and lectures as shown in the table below.
2. *Homework* (40% of grade): Ten sets of homework, each worth 4%, with true-false, multiple choice, multiple answer, and short-answer questions based on readings and lectures, will be assigned to cement concepts and provide students with an opportunity to evaluate their own acquisition and comprehension. Homework can be taken as many times as needed before the due date. The homework must be **your own work**, not done in collaboration with other students.
3. *Attendance* (15% of grade): Presence in all classes is mandatory and will be recorded at each class session – students earn 1.5% for every 2 classes attended, i.e., attending 20 classes earns full attendance credit. Unannounced in-class quizzes will be given from time to time with questions based on the readings. Students may be excused from attendance for valid reasons such as illness by informing the instructor (Kinter) at least 2 hours prior to class time.
4. *Mid-term examination* (20% of grade): A test to evaluate students' acquisition and comprehension of material discussed in the **first 12 class sessions and textbook assignments**.
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., attending more than 20 classes, participating in a student debate, etc.).
7. *Participation:* Students are expected to pay attention and participate during class sessions. While this is a large class, every effort will be made to provide opportunities for interaction. This may take the form of questions posed to randomly selected students in attendance.

[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.

Detailed Course Schedule (subject to minor adjustment)

Date	*Session*	*Topic*	*Reading(s)*	*Work / activity / handouts*
24 Aug	1	**Introduction to CLIM101: Our Place in the Universe**	Syllabus	Questionnaire
26 Aug	2	**10 Themes of CLIM 101**	JH Chapter 1	
31 Aug	3	**What is the Climate of the Earth?**	NA	
02 Sep	4	**Global Warming and the Greenhouse Effect**	JH Chapters 1 & 2	**HW #1 DUE**
07 Sep	5	**Greenhouse Gases**	JH Chapter 3	
09 Sep	6	**Student Debate: Are humans causing global heating?**	NA	**HW #2 DUE**
14 Sep	7	**Earth's Past Climate**	JH Chapter 4	
16 Sep	8	***An Inconvenient Truth***	https://en.wikipedia.org/wiki/An_Inconvenient_Truth	**HW #3 DUE**
21 Sep	9	**Earth Current Climate – What's Different Now?**	JH Chapter 4	
23 Sep	10	**Predicting Future Climate**	JH Chapters 5 & 6	**HW #4 DUE**
28 Sep	11	***Global* Impacts and Consequences**	JH Chapter 7	
30 Sep	12	***Regional* Impacts and Consequences**	JH Chapter 7	**HW #5 DUE**
05 Oct	13	***Review for Mid-term exam***	JH Chapters 1-7; lecture notes	
07 Oct	14	**MID-TERM EXAMINATION**		**In-class exam**
12 Oct	NA	***NO CLASS*** *(Fall Break)*	NA	NO CLASS
14 Oct	15	**Impacts on Virginia – Sea Level, Heat Waves and Drought, Flash Floods**	JH Chapter 7	
19 Oct	16	**Communicating Climate Change**	JH Chapter 8	Guest Lecture - Maibach
21 Oct	17	**Detection and Attribution of Climate Change**	JH Chapter 9	
26 Oct	18	**Broader Impacts of Climate Change**	JH Chapter 7	
28 Oct	19	**Climate, Ecosystems and Human Society: The Ethics of Climate Change**	JH Chapter 8	**HW #6 DUE**
02 Nov	20	**The Economics of Climate Change**	JH Chapters 10 & 11	
04 Nov	21	**Climate Change Policy in the US and Virginia**	JH Chapter 10	**HW #7 DUE**
09 Nov	22	**Climate Change Adaptation and Mitigation**	JH: Chapter 11	
11 Nov	23	**Energy, Renewables and the Social Cost of Carbon**	JH Chapters 11 & 12	**HW 8 DUE**
16 Nov	24	**The (US) Politics of Climate Change**	JH Chapter 10	
18 Nov	25	**Hopeful Climate Solutions: U.S.**	JH Chapter 10	**HW# 9 DUE**
23 Nov	26	**Hopeful Climate Solutions: International**	JH Chapter 10	
25 Nov	NA	***NO CLASS*** *(Thanksgiving)*	NA	NO CLASS

30 Nov	27	**Student Debate: Will reducing GHG emissions destroy the economy?**	NA	
02 Dec	28	**Review for Final Exam**	JH Chapters 1-12; lecture notes	Questionnaire; **HW #10 DUE**
14 Dec	NA	**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 change and how such changes affect economies and societies, both globally and regionally. The particular emphasis on the global warming policy debate will stimulate students to be better informed about potential problems such as heat waves, 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.
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.

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.

Safe Return to Campus

All students taking courses with a face-to-face component are required to follow the university's public health and safety precautions and procedures outlined on the university Safe Return to Campus webpage (*https://www2.gmu.edu/safe-return-campus*). Similarly, all students in face-to-face and hybrid courses must also complete the Mason COVID Health Check daily, seven days a week. The COVID Health Check system uses a color code system **and students will receive either a Green, Yellow, or Red email response.** Only students who receive a "green" notification are permitted to

attend courses with a face-to-face component. **If you suspect that you are sick or have been directed to self-isolate, please quarantine or get testing. Faculty are allowed to ask you to show them that you have received a Green email and are thereby permitted to be in class.**

Students are required to follow Mason's current policy about facemask-wearing. As of August 11, 2021, all community members are required to wear a facemask in all indoor settings, including classrooms. An *appropriate facemask* must cover your nose and mouth at all times in our classroom. If this policy changes, you will be informed; however, students who prefer to wear masks either temporarily or consistently will always be welcome in the classroom.

If the campus closes, or if a class meeting needs to be canceled or adjusted due to weather or other concern, students should check Blackboard [or other instruction as appropriate] for updates on how to continue learning and for information about any changes to events or assignments.

Academic Integrity:

Mason is an Honor Code university; please see the Office for Academic Integrity (https://oai.gmu.edu/) 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.

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

Diversity and Inclusion:

This course will be conducted in a manner that is consistent with the George Mason University policies on non-discrimination (https://universitypolicy.gmu.edu/policies/non-discrimination-policy/), and diversity (https://stearnscenter.gmu.edu/knowledge-center/general-teaching-resources/mason-diversity-statement/) 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.

As faculty members and designated "Responsible Employees," the instructors for this course are required to report all disclosures of sexual assault, interpersonal violence, and stalking to Mason's *Title IX Coordinator* per *university policy 1412*. If you wish to speak with someone confidentially, please contact the *Student Support and Advocacy Center* (703-993-3686) or *Counseling and Psychological Services* (703-993-2380). You may also seek assistance from *Mason's Title IX Coordinator* (703-993-8730; titleix@gmu.edu).

Gender identity and pronoun use: If you wish, please share your name and gender pronouns with me (ikinter@gmu.edu) and how best to address you in class and via email.

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://stearnscenter.gmu.edu/knowledge-center/knowing-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.