

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

Fall 2023 – Syllabus

(updated 24 August 2023)

<b>Instructors:</b>	James L. Kinter (office: 284 Research Hall, e-mail: <a href="mailto:ikinter@gmu.edu">ikinter@gmu.edu</a> ) J. Shukla (office: 105 Research Hall, email: <a href="mailto:jshukla@gmu.edu">jshukla@gmu.edu</a> )
<b>Class Schedule:</b>	Sec. DL1 Tuesday & Thursday 10:30 – 11:45 am ET (online BB Collaborate) Sec. 001 Tuesday & Thursday 10:30 – 11:45 am ET (Innovation Hall #103)
<b>Office Hours:</b>	(Kinter) Tuesday, 11:45 am – 1:00 pm
<b>Important Dates:</b>	5 September 2023                      Last day to drop with 100% tuition refund 5 October 2023                        Mid-term Examination 10 October 2023                      No Class (Fall Break) 23 November 2023                    No Class (Thanksgiving) 12 December 2023                    Final Examination (10:30 am – 1:15 pm EST) 18 December 2023                    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 trace 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, which 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, vulnerability to climate change 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:

Section DL1: This course is being offered online synchronously, which means that class sessions will take place at the scheduled time online using Blackboard Collaborate as the streaming service.

Section 001: 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 Blackboard, (<https://mymason.gmu.edu>), where all lecture notes, assignments and reading materials will be posted. Recordings of classes will be available for Sec. DL1. 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:
  - 1.1. **(abbreviated AD in schedule below)** Introduction to Modern Climate Change (3<sup>rd</sup> edition; 2022) by Andrew Dessler  
(available in the bookstore; Gateway Library<sup>1</sup>; Amazon: <https://www.amazon.com/Introduction-Modern-Climate-Change-Dessler-dp-1108793878/dp/1108793878>)
2. Recommended Reading:
  - 2.1. Global Warming – The Complete Briefing (5<sup>th</sup> edition; 2015) by John Houghton  
(available in the bookstore – online only; Gateway Library)  
Note: This has been used as a textbook for CLIM 101 in past years.
  - 2.2. The Science and Politics of Global Climate Change (2<sup>nd</sup> edition; 2010) by A. Dessler and E. Parson  
(<http://www.amazon.com/Science-Politics-Global-Climate-Change/dp/0521737400>)
  - 2.3. Merchants of Doubt (2011) by Naomi Oreskes and Erik Conway  
(<http://www.amazon.com/Merchants-Doubt-Handful-Scientists-Obscured/dp/1608193942>)
  - 2.4. Drawdown by Paul Hawken (ed.) (2017)  
(<https://www.amazon.com/Drawdown-Comprehensive-Proposed-Reverse-Warming/dp/0143130447/>)
  - 2.5. The Atlas of Climate Change (2011) by Kirstin Dow and Thomas E. Downing  
(<https://www.amazon.com/Atlas-Climate-Change-Greatest-Challenge-dp-0520268237/dp/0520268237>)
  - 2.6. Dire Predictions by Michael Mann and Lee Kump (2008)  
(<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 necessary before the due date. There is a 0.4% penalty on the final grade for each late homework. **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 the **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.). There will be other opportunities as well.
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.

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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.

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

<i>Date</i>	<i>Session</i>	<i>Topic</i>	<i>Reading(s)</i>	<i>Work / activity / handouts</i>
22 Aug	1	<b>Introduction to CLIM101: Our Place in the Universe</b>	Syllabus	In-class questionnaire
24 Aug	2	<b>Overview: Understanding Climate Change</b>	AD Chapter 1	
29 Aug	3	<b>What is the Climate of the Earth?</b>	AD Chapter 2	
31 Aug	4	<b>Earth's Past Climate</b>	AD Chapter 2	
05 Sep	5	<b>Global Warming and Greenhouse Effect</b>	AD Chapters 3 & 4	
07 Sep	6	<b>Greenhouse Gases</b>	AD Chapters 5 & 6	<b>HW #1 DUE</b>
12 Sep	7	<b>Student Debate: Are humans causing global heating?</b>	NA	
14 Sep	8	<i>An Inconvenient Truth</i>	Film	<b>HW #2 DUE</b>
19 Sep	9	<b>Earth Current Climate – What's Different Now?</b>	AD Chapter 7	
21 Sep	10	<b>Predicting Future Climate</b>	AD Chapter 8	<b>HW #3 DUE</b>
26 Sep	11	<b>Global Impacts and Consequences</b>	AD Chapter 9	
28 Sep	12	<b>Regional Impacts and Consequences</b>	AD Chapter 9	<b>HW #4 DUE</b>
03 Oct	13	<b>Review for Mid-term exam</b>	AD Chapters 1-9; lecture notes	
05 Oct	14	<b>MID-TERM EXAMINATION</b>	NA	<b>HW #5 DUE; In-class/online exam</b>
10 Oct	NA	<b>NO CLASS (Fall Break)</b>	NA	<b>NO CLASS</b>
12 Oct	15	<b>Science, Politics &amp; Media Roles in Shaping Public Opinion about Climate Change</b>	AD Chapter 13	Guest Lecture - Maibach
17 Oct	16	<b>Climate, Ecosystems and Human Society: The Ethics of Climate Change</b>	AD Chapter 13	
19 Oct	17	<b>Debunking Climate Change Myths</b>	NA	Guest Lecture - Burls
24 Oct	18	<b>The (US) Politics of Climate Change</b>	AD Chapter 11	
26 Oct	19	<b>Detection and Attribution of Climate Change</b>	AD Chapter 9.2.6	<b>HW #6 DUE</b>
31 Oct	20	<b>Climate Change Adaptation and Mitigation</b>	AD Chapter 11 & 12	
02 Nov	21	<b>Energy, Renewables and Decarbonization</b>	AD Chapters 11 & 12	<b>HW #7 DUE</b>
07 Nov	22	<b>The Economics of Climate Change</b>	AD Chapter 12	
09 Nov	23	<b>Hopeful Signs in the USA</b>	AD Chapters 14	<b>HW 8 DUE</b>
14 Nov	24	<b>Hopeful Signs in the World</b>	AD Chapter 14	
16 Nov	25	<b>Impacts on Virginia – Sea Level, Heat Waves and Drought, Flash Floods</b>	AD Chapter .9	<b>HW# 9 DUE</b>
21 Nov	26	<b>Climate Change Policy in Virginia and USA</b>	AD Chapter 11	
23 Nov	NA	<b>NO CLASS (Thanksgiving)</b>	NA	NO CLASS

28 Nov	27	<b>Student Debate: Should US government enact policy to reduce GHG emissions?</b>	NA	
30 Nov	28	<b>Review for Final Exam</b>	AD Chapters 1-14; lecture notes	In-class questionnaire; <b>HW #10 DUE</b>
12 Dec	29	<b>FINAL EXAMINATION</b>	NA	<b>In-class/online 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 understanding of the scientific underpinnings of how weather and climate change and how such changes affect economies, societies, and ecosystems, both globally and regionally. The 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 stimulate 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 own Mason email and Blackboard accounts to receive important University information, including messages related to this class. See <http://masonlive.gmu.edu> for more information.

### **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, cultures, 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 ask the instructor ([ikinter@gmu.edu](mailto: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 recognizing and celebrating 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, gender identity, religion, age, disability, and sexual orientation. Diversity also entails different viewpoints, philosophies, and perspectives. Attention to these aspects of diversity helps 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 classroom settings; it is also found with the delivery of services and activities, including, but not limited to, curriculum and teaching.

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](mailto:titleix@gmu.edu)).

*Gender identity and pronoun use:* If you wish, please share your name and gender pronouns with me ([ikinter@gmu.edu](mailto: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.