

Physics 105

Fall 2024

A Global Challenge: Energy and Climate Change

Professor Jordan Goodman

Course Description: The aim of this course is for you to learn how science attacks one of the *most* important issue facing our planet. How will the world address the energy needs of a growing population and its impact on climate change? This class will explore potential solutions to mitigate our atmospheric impact, including technological innovations and policy measures. Additionally, we will analyze the roles of economics, government, and industry in shaping our responses within the context of modern science. This course is aimed at the non-science major although science majors are welcome.

Specific objectives are:

- To understand the human impact on the global climate and the fundamental science of climate, energy and energy usage in the world.
- To learn, through the process of discovery, how science formulates questions and addresses them with reasoning, evidence, and argumentation.
- To address specific questions which must be asked and answered in order to understand the important societal questions of energy usage and environmental impact.

This is a *Marquee Science and Technology Course*: At the completion of a Marquee Course you should be able to:

1. Look at complex questions and identify the science in the question and how it impacts and is impacted by political, social, economic, and ethical dimensions
2. Understand the limits of scientific knowledge
3. Critically evaluate science arguments
4. Ask good questions
5. Find information using various sources and evaluate the veracity of the information
6. Communicate scientific ideas effectively
7. Relate science to a personal situation

Contact Information: Prof. Jordan Goodman

Office: Physical Sciences Complex 2208G (Opposite the elevator on the 2nd floor)

Email: goodman@umd.edu (This is the best and pretty much only way to reach me)

Please email me directly and do not use ELMS mail.

Regular Office hours: Monday after class 2:15pm – 3:15pm (other times are fine with an email to set it up)

TA: TBD

Canvas software: Our course will utilize Canvas software for grades and all assignments. The link to our class is found through <https://elms.umd.edu>

Text: We will use an online draft textbook distributed as readings through ELMS, at no cost!

Other books (not required but interesting):

- Gordon Aubrecht, Energy: Physical, Environmental and Social Impact
- Spencer Weart, The Discovery of Global Warming
- Michael McElroy Energy and Climate – Vision for the Future
- DavidWallace-Wells The Uninhabitable Earth: A Story of the Future

Campus Policies

It is our shared responsibility to know and abide by the University of Maryland's policies that relate to all courses, which include topics like:

- Academic integrity
- Student and instructor conduct
- Accessibility and accommodations
- Attendance and excused absences
- Grades and appeals
- Copyright and intellectual property

Please visit <http://www.ugst.umd.edu/courserelatedpolicies.html> for the Office of Undergraduate Studies' full list of campus-wide policies and follow up with me if you have questions.

Academic Integrity

For this course, some of your assignments will be collected via Turnitin on our course ELMS page. I have chosen to use this tool because it can help you improve your scholarly writing and help me verify the integrity of student work. For information about Turnitin, how it works, and the feedback reports you may have access to, visit [Turnitin Originality Checker for Students](#)

Names/Pronouns and Self-Identifications

The University of Maryland recognizes the importance of a diverse student body, and we are committed to fostering inclusive and equitable classroom environments. I invite you, if you wish, to tell us how you want to be referred to both in terms of your name and your pronouns (he/him, she/her, they/them, etc.). The pronouns someone indicates are not necessarily indicative of their gender identity. Visit trans.umd.edu to learn more.

Additionally, how you identify in terms of your gender, race, class, sexuality, religion, and dis/ability, among all aspects of your identity, is your choice whether to disclose (e.g., should it come up in classroom conversation about our experiences and perspectives) and should be self-identified, not presumed or imposed. I will do my best to address and refer to all students accordingly, and I ask you to do the same for all of your fellow Terps.

Attendance: The class will be interactive, with in-class group activities and responses. Your attendance is critical to your success. Participation in class and discussion sections will be part of your grade.

Participation

- Given the interactive style of this class, attendance will be crucial your performance in this class. Attendance is particularly important also because class discussion will be a critical component for your learning.
- Each student is expected to make substantive contributions to the learning experience, and attendance is expected for every session.
- Students with a legitimate reason to miss a live session should communicate in advance with the instructor, except in the case of an emergency.
- Students who miss a live session are responsible for learning what they miss from that session.
- Additionally, students must complete all readings and assignments in a timely manner in order to fully participate in class.

Communication with Peers:

With a diversity of perspectives and experience, we may find ourselves in disagreement and/or debate with one another. As such, it is important that we agree to conduct ourselves in a professional manner and that we work together to foster and preserve a virtual classroom environment in which we can respectfully discuss and deliberate controversial questions.

I encourage you to confidently exercise your right to free speech—bearing in mind, of course, that you will be expected to craft and defend arguments that support your position. Keep in mind, that free speech has its limit and this course is NOT the space for hate speech, harassment, and derogatory language. I will make every reasonable attempt to create an atmosphere in which each student feels comfortable voicing their argument without fear of being personally attacked, mocked, demeaned, or devalued.

Any behavior (including harassment, sexual harassment, and racially and/or culturally derogatory language) that threatens this atmosphere will not be tolerated. Please alert me immediately if you feel threatened, dismissed, or silenced at any point during our semester together and/or if your engagement in discussion has been in some way hindered by the learning environment.

Reading: There will be reading assignments to be completed *before* each class, and a short assignment (typically a short answer to a question or two) related to the reading. There will be discussion related to the reading in class, so be sure to do your reading – you may be asked about it!

Quizzes: There will be occasional in-class quizzes without prior announcement. The lowest quiz grade will be dropped.

Homework: There will be two components to the homework. Each week you will find and submit a link to a relevant article in the media. Be prepared to summarize and discuss in class. Other homework will be assigned approximately every other week. All assignments will be posted on our course website as well as in lecture. Late homework will not be accepted except in the case of illness verified by a doctor's signature.

Projects: There will be two group projects during the semester. Participation in these projects is essential and will hopefully be enjoyable. Students will work together in groups for each project and will peer evaluate each other.

Lecture:

Monday & Wednesday 1-1:15 Toll Building 1412

Discussion: –

TBD

Important Tentative Dates:

First class lecture	August 26	
Labor Day (no class)	Monday, Sept. 2	
Midterm exam 1	Monday, September 30	<i>Tentative</i>
Midterm exam 2	Monday, November 11	<i>Tentative</i>
Thanksgiving break	November 27	
Last class	December 10	
Final Exam	TBD	

If you have a reason why you cannot attend class (religious holiday, official University business), see me before the exam! Only medical emergencies will be considered as excuses *after* the exams. If you miss an exam with a valid excuse, a makeup exam will be given.

Extra Help: I will be available at the end of each lecture to answer questions or come to my office hours (Monday after class) or schedule a time to talk in person or via Zoom or talk to your TA. Please seek help at the first sign of difficulties or confusion.

Notes: I will post .pdf versions of the lecture notes on the course web site after class.

Grading: Your grade tentatively will be based on the following:

Midterms (10% each)	20%
Project #1	10%
Project #2	15%
Quizzes	10%
Homework (Including discussion boards)	15%
Class Participation	10%
Final Exam	20%

Disabilities: If you have a documented disability and wish to discuss accommodations, please contact me as soon as possible.

Helpful tips:

- 1) **Read the assignments and watch videos** *before* class and refresh yourself after. Zoom sessions will be recorded so you can review them.
- 2) **Do the weekly postings and homework.** There will be approximately 6 homework assignments. You may collaborate (which does not mean copy) on homework assignments, but you will be responsible for producing your own work.
- 3) **Attend class.** Classes will be interactive with a mix of lecture, group activities, demonstrations, and discussion.
- 4) **Attend the discussion sections** - Much of your project work will be done in the discussion sections.
- 5) **Contribute to the projects.** There will be major group projects assigned during this course. Participation in these projects is essential and will hopefully be enjoyable. Students will work together in groups for each project and will peer evaluate each other.

6) **Interact with your classmates.** Trying to explain something to someone else is often the best way for you to fully understand the concept.

7) **Ask questions in class.** There are no stupid questions – only ones you don't ask.

Tentative Schedule:

This topic is about as current as it can get, so we will have a nimble and flexible schedule so that we can adapt to things happening during the semester.

- Population and Growth
- Covid-19
- Climate Change
- Energy Concepts
- Fossil Fuels
- Food
- Transportation
- Renewable Energy
- Politics