

SCI 100: Climate change

West Chester University
Spring 2021

Syllabus

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Instructor

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Office hours

Day	Time
Tuesday	11:00 am–12:00 pm ET
Thursday	11:00 am–12:00 pm ET
Friday	10:00 am–12:00 pm ET

Course details

The format for this course is *remote-synchronous*.

- We have **synchronous class meetings** via [Zoom](#) on Monday and Wednesday at our official course meeting times:

Section	Day	Time	Zoom link
02	Monday & Wednesday	10:00–10:50 am ET	
01	Monday & Wednesday	11:00–11:50 am ET	

- We have **asynchronous class activities** on Friday. Asynchronous activities are provided on [D2L](#) and do not need to be completed during our official course meeting times – See [Participation](#) below.

Course description

This course provides an introduction to the science of climate change. Core topics include albedo, the greenhouse effect, the carbon cycle, and feedback mechanisms between these phenomena. We will study past climates, climate models, and the impacts of modern climate change. Near the end of the semester we will discuss efforts to mitigate climate change. We conclude by briefly discussing the most widely adopted climate change policies. No previous experience with these subjects is assumed.

SCI 100 is approved as a WCU General Education Science Distributive course.

Time commitment

This is a three credit-hour course. In addition to three 50-minute classes, this course requires (on average) 1-4 hours of reading, assignments, and studying outside of class time each week.

Student learning outcomes

SCI 100 is approved as a WCU General Education Science Distributive course, and as such meets the following General Education Goals.

Gen Ed Goal #1 Communicate effectively:

a) Express oneself effectively in common college-level written forms.

In particular, after successfully completing this course a student will be able to explain, in plain language and to someone who is not familiar with these topics:

- The role energy balance and radiative forcing play in determining the average surface temperature of the earth.
- How greenhouse gases and the greenhouse effect work.
- The carbon cycle and its role in our climate.
- The challenges that “feedbacks” contribute to modeling and predicting climate.

In class, think-pair-share exercises and group discussions give students practice communicating physical concepts in plain language. Weekly homework assignments include short-answer questions which provide practice for written communication.

Effective written communication is assessed through essay questions on in-class exams and the final project.

Gen Ed Goal #3 Employ quantitative concepts and mathematical methods:

- a) Employ quantitative methods to examine a problem in the natural or physical world.
- b) Apply the basic methods and thought processes of the scientific method for natural/physical science in a particular discipline.

After successfully completing this course a student will be able to:

- Solve problems involving the physics of matter, light, and energy.
- Use simple models of the atmosphere to determine how features such as albedo, greenhouse gasses, and solar energy effect surface temperature.
- Compare the timescales of phenomena which contribute to the earth’s climate.
- Estimate a person’s carbon footprint.

Essentially every element of this course involves quantitative methods. We use tools such as arithmetic, algebra, and interpreting graphs are employed in every aspect of the course. Lectures devote time to reviewing these important skills *in situ*. In-class examples train students in problem-solving skills such as organizing information, visualizing and diagramming, recognizing concepts, strategizing solutions, using mathematical relations, and assessing results. Weekly homework assignments include quantitative problems which provide practice with analyzing graphs and problem-solving within the context of climate science.

Quantitative methods are primarily assessed through in-class exams. The final project also involves a computation.

Gen Ed Goal #2 Think critically and analytically:

- b) Construct and/or analyze arguments in terms of their premises, assumptions, contexts, conclusions, and anticipated counter-arguments.**
- c) Reach sound conclusions based on a logical analysis of evidence.**

After successfully completing this course a student will be able to:

- Critically assess the evidence that recent global warming is largely due to human activity.
- Weigh the merits of approaches to addressing climate change, including adaption, mitigation, and geoengineering.

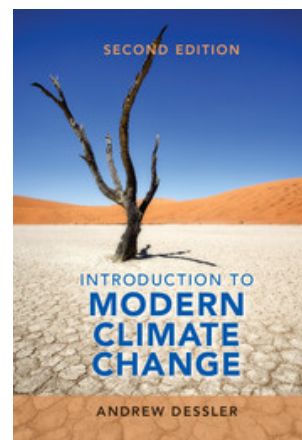
At several points in this semester we will treat a conclusion of the science community as a case study in the synthesis of evidence and of logical analysis. We will analyze both the consensus view as well as the counter-arguments of skeptics. Group discussions and short-answer homework questions provide students with the opportunity to practice critically assessing scientific arguments.

Effective critical thinking is assessed through essay questions on in-class exams and through the final project.

In addition to these goals, an elementary but essential goal of this course is for every student to be able to find trustworthy information about climate science and climate change policy. Reliable, consensus-based, scientific sources of information will be emphasized throughout the course.

Course materials

- **Textbook:** The course textbook is *Introduction to Modern Climate Change*, Second Edition, by Andrew Dessler (ISBN: 9781107480674). The textbook is for sale at the [WCU campus store](#); you will find less expensive options elsewhere. I recommend the [e-textbook](#), which is cheap and saves paper.
- **Scientific calculator:** You will need a calculator that can compute powers, exponentials (e^x or $\exp x$), and logarithms ($\log x$ or $\ln x$). There are plenty of free web-based calculators; I recommend the [desmos scientific calculator](#).



Assessment

This course follows the official WCU scale for grades:

Grade	Quality Points	Percentage	Interpretation
A	4.00	93–100	Excellent
A–	3.67	90–92	
B+	3.33	87–89	Superior
B	3.00	83–86	
B–	2.67	80–82	
C+	2.33	77–79	Average
C	2.00	73–76	
C–	1.67	70–72	
D+	1.33	67–69	Below Average
D	1.00	63–66	
D–	0.67	60–62	
F	0.00	<60	Failure

Refer to the [WCU Undergraduate Catalog](#) for description of NG (No Grade), W, Z, and other grades. Elements of the course will contribute to the course grade as follows:

Percent	Category
10%	Participation
35%	Homework
40%	Asynchronous exams
15%	Final project

10% Participation: You are expected to participate in synchronous class meetings, and you are expected to complete asynchronous activities according to the [Course Schedule](#).

You are expected to be present and attentive during the entirety of synchronous class meetings. Participation in meetings is determined by your contributions to discussion as well as by learning activities such as [Zoom](#) polls, group activities, and other artifacts. These activities are not assessed for accuracy, just participation.

Friday asynchronous activities will be available by 10:00 am ET on the scheduled day. You will earn full credit for participation if you complete the activities prior to 10:00 am ET on the following Monday. Participation in asynchronous activities is measured by tools such as H5P questions, quizzes, and the [D2L](#) completion tracker.

35% **Homework:** There is a brief homework assignment associated to every class (both synchronous and asynchronous). The homework for each class is due at **11:59 pm ET** on the *next class day*. For example:

- If Lesson 3.1 is a synchronous class meeting on Wednesday, then Homework 3.1 is due Friday evening at 11:59 pm ET.
- If Lesson 3.2 is an asynchronous class activity on Friday, then Homework 3.2 is due Monday evening at 11:59 pm ET.

In general, homework assignments are completed as “quizzes” on [D2L](#). Details of each assignment are provided on [D2L](#).

Homework often features quizzes that are graded by computer. For these quizzes, you are allowed **unlimited attempts** to submit answers for full credit. After the deadline for the assignment has passed, the assignment will close and you will receive a score equal to your highest attempt.

Homework occasionally includes questions with written responses. These are graded by the instructor. For these questions, you may revise your answer as many times as you like prior to the deadline, and only your final submission will be graded. Written work is assessed for completeness as well as accuracy.

Answers to homework are available on [D2L](#) shortly after the assignment deadline.

40% **Asynchronous exams:** There will be three asynchronous exams offered during the semester. Each exam contributes equally to the course grade. Tentative exam dates are listed on the [Course Schedule](#).

Exams are offered as “quizzes” on [D2L](#). Exams will become available no later than 10:00 am ET on Friday, and will close at 10:00 am ET on the following Monday. You may complete the exam any time within this period. Once you start the exam, you will have 50 minutes to complete the exam. You may submit answers to the exam only once.

During an exam you may use a calculator, course materials, and any notes created by you. You may not use other resources, or collaborate or communicate with anyone. Submissions may be assessed for originality using [Turnitin](#).

Exam scores may be scaled (“curved”) to conform to a standard distribution of grades. Failure to take an exam results in a 0 score.

15% **Final project:** In this project you will estimate your carbon footprint and reflect upon your result. In the first part of the project, you will make a detailed estimate of

the carbon footprint of one year of your current lifestyle (or, in your pre-COVID lifestyle). In the second part, you will respond to questions about how to reduce your footprint, and how various climate change policies might effect your footprint. A detailed description of the project will be provided in the Project prompt provided later in the semester.

The final project is submitted via [D2L](#) and is due **Monday, 10 May at 11:59 pm ET**.

Although unlikely, I reserve the right to alter the assessment scheme in order to accommodate for unforeseen circumstances or to better serve the learning objectives of the course. Due dates of assignments as well as the dates of exams may change.

Policies on late or missed work

If you suspect that you will not be able to meet a course deadline you should notify me in advance so that we can discuss possible resolutions. The default policies on late and missed work are as follows:

- **Participation:** It is not possible to make up missed participation opportunities. Your participation is excused if a class activity conflicts with an event recognized by the WCU [Excused Absences Policy](#) – see [Excused absences](#).
- **Homework:** In general, homework deadlines are strict and no work is accepted after the deadline has passed. You can receive an extension on an assignment if the associated class or deadline conflicts with an event recognized by the WCU [Excused Absences Policy](#) – see [Excused absences](#).
- **Exams:** Exams are not offered at alternate times, unless an exam conflicts with an event which is recognized by the WCU [Excused Absences Policy](#) – see [Excused absences](#).
- **Final project:** If requested in advance, you can receive a short extension on the project.

Attendance policy

You are expected to attend and actively participate in class meetings. Participation is a graded item in this course – see [Participation](#) above.

If you miss a class meeting then it is your responsibility to make up the missed learning opportunity by reviewing course materials on your own. Missing class does not excuse you from completing other aspects of the course on time.

Excused Absences

This course adheres to the WCU [Excused Absences Policy](#). If you are unable to perform an aspect of the course due to a conflict recognized by this policy (which includes University-Sanctioned Events) you must notify me in advance so that we can make arrangements. **Documentation verifying your participation in the event must be submitted via D2L** (path: Assessments>Assignments>Documentation for excused absences).

Accommodation

If you require additional accommodation for any aspect of the course you must notify me in advance so that we can make arrangements. Depending on the accommodation, you may need to provide documentation.

- **OSSD:** If you have an ongoing medical condition which effects your ability to meet the course expectations then you should register with the [Office of Services for Students with Disabilities](#) (OSSD). **To receive accommodation you must submit your OSSD letter via D2L** (path: Assessments>Assignments>OSSD letters of accommodation).
- **Health/wellness conditions:** If you have a medical condition which causes you to miss at least three consecutive school days then you may seek accommodation from [Student Assistance](#).
- **Personal emergencies:** Rarely, a personal emergency can arise which prevents a student from meeting course expectations. In such a rare circumstance I am happy to work with the student in order to make appropriate arrangements. I may require documentation which verifies the emergency. [Student Assistance](#) can serve as a confidential liaison to verify the emergency.

Course schedule

The Course Schedule is provided on our course [D2L](#) homepage. The schedule provides hyperlinks to lectures slides, asynchronous activities, homework assignments, and other course materials. It also includes recommended reading from the textbook. This schedule will be updated regularly as the course progresses. While the *pattern* of activities will be quite regular, there may be frequent small changes to the scheduled *content*, in order to better meet our needs or accommodate unforeseen circumstances. Please consult the schedule regularly.

D2L, email, and all that

- **D2L:** Course materials are maintained on the course [D2L](#) site. You are responsible for regularly checking the course [D2L](#) site. I may not announce in class changes to course content on [D2L](#). As with all technology, [D2L](#) can have glitches and service outages. For this reason, check [D2L](#) frequently and do not leave tasks to the last minute.
- **Communication:** I use the [D2L](#) announcement tool to make class-wide announcements. I use email for individual correspondence and for time-sensitive class-wide communications. Except in the event of a technical failure or an emergency, I will only use university email (mine and yours) to correspond.
- **Email:** Emails should be written with appropriate language and etiquette. Please consult the guide [here](#).
- **Recording:** This course uses technology for virtual meetings. The use of such technology is governed by privacy laws, including Pennsylvania Wiretap Law and FERPA.

Students do not have permission to record virtual meetings or any other audio or visual correspondence related to this course or the instructor. See [Accommodation](#) above and [Intellectual property](#) below.

- **Discussing grades:** I am happy to discuss your progress in the course during an office hours appointment. Due to limitations set by federal law (FERPA), I generally will not discuss grades over email.

Tutoring opportunities

- Tutoring for introductory science courses is available through the [Learning Assistance & Resource Center](#). This service is free, but availability is limited. Also, since this is the first time this course is being offered, I do not know how useful this service will be.
- Occasionally, science majors offer private tutoring for a fee. If this service is available for this course, then I will post a list of tutors on [D2L](#).

Academic integrity

Students are expected to follow the [Student Code of Conduct](#) as well as follow the rules and guidelines on academic integrity described in the [WCU Undergraduate Catalog](#). Here are a few relevant issues for this class:

- **Online platforms:** Email, [D2L](#) and [Zoom](#) are extensions of the classroom and as such all WCU rules regarding student behavior apply on these platforms. Do not violate the copyrights of materials on these platforms. Do not misrepresent your identity on these platforms, either by impersonating someone else or by allowing another person to impersonate you.
- **Collaboration:** Students are encouraged to study together and collaborate on assignments. However, you should go through the process of answering each homework question yourself. Any written work must be your own language and thought. Submitting work which you have not yourself created is fraud.
- **Resources:** Students are welcome to use resources, both physical and online, to help them complete assignments. However, “resources” does not include specific answers to assigned questions, whether found online or elsewhere. Submitting work which you have not yourself created is fraud.
- **Text recognition software:** Students agree that by taking this course all written assignments may be submitted for textual similarity review to [Turnitin](#) (directly or via [D2L](#)) for the detection of plagiarism. All assignments submitted to [Turnitin](#) will be included as source documents in the [Turnitin](#) reference database solely for the purpose of detecting plagiarism of such papers. If requested in advance, personal identifiers (student name, ID#, etc.) can be removed from an assignment before it is uploaded into [Turnitin](#). Use of [Turnitin](#) page service is subject to the Usage Policy and Privacy Pledge posted on the [Turnitin](#) site.

Students who violate WCU rules of academic integrity will receive an [Academic Integrity Violation Report](#), and may receive a failing grade (F) in the course.

Intellectual property

The instructor utilizes copyrighted materials under the Freedom and Innovation Revitalizing the United States Entrepreneurship Act of 2007 (Fair Use Act). Apart from such copyrighted materials, all other intellectual property associated with this course is owned and copyrighted by the instructor, including, but not limited to, lectures, course discussions, course notes, slides, assessment instruments such as exams, and supplementary materials posted or provided to students authored by the instructor. No recording, copying, storage in a retrieval system, or dissemination in any form by any means of the intellectual property of the instructor, in whole or in part, is permitted without prior written permission of the instructor. When such permission is granted, it must specify the utilization of the intellectual property and all such permissions and waivers shall terminate on the last day of the semester in which this course is held.

Statements Common to All WCU Undergraduate Syllabi



COVID-19 STATEMENT

Part of West Chester University's response to the COVID-19 pandemic was to switch the vast majority of instruction to remote. This decision was made out of an abundance of caution to protect the health of all members of the WCU community. Faculty have been asked to make every effort to adapt their courses to this novel situation while still meeting the critical learning outcomes of the course. Students are asked to discuss any problems with the new course format and schedule directly with their instructors. Patience and flexibility on everyone's behalf are critical to our community's navigation of this public health crisis.

For this particular course, the following alternative modalities are being utilized:

- Lecture activities are completed remotely through both synchronous and asynchronous activities.
- Assessment activities are completed remotely through both synchronous and asynchronous activities.
- Office hours are completed remotely through both synchronous and asynchronous communication.

ACADEMIC & PERSONAL INTEGRITY

It is the responsibility of each student to adhere to the university's standards for academic integrity. Violations of academic integrity include any act that violates the rights of another student in academic work, that involves misrepresentation of your own work, or that disrupts the instruction of the course. Other violations include (but are not limited to): cheating on assignments or examinations; plagiarizing, which means copying any part of another's work and/or using ideas of another and presenting them as one's own without giving proper credit to the source; selling, purchasing, or exchanging of term papers; falsifying of information; and using your own work from one class to fulfill the assignment for another class without significant modification. Proof of academic misconduct can result in the automatic failure and removal from this course. For questions regarding Academic Integrity, the No-Grade Policy, Sexual Harassment, or the Student Code of Conduct, students are encouraged to refer to the Department Undergraduate Handbook, the Undergraduate Catalog, the Ram's Eye View, and the University website at www.wcupa.edu.

STUDENTS WITH DISABILITIES

If you have a disability that requires accommodations under the Americans with Disabilities Act (ADA), please present your letter of accommodations and meet with me as soon as possible so that I can support your success in an informed manner. Accommodations cannot be granted retroactively. If you would like to know more about West Chester University's Services for Students with Disabilities (OSSD), please visit them at 223 Lawrence Center. Their phone number is 610-436-2564, their fax number is 610-436-2600, their email address is ossd@wcupa.edu, and their website is at <https://www.wcupa.edu/universityCollege/ossd/>. In an effort to assist students who either receive or may believe they are entitled to receive accommodations under the Americans with Disabilities Act and Section 504 of the Rehabilitation Act of 1973, the University has appointed a student advocate to be a contact for students who have questions regarding the provision of their accommodations or their right to accommodations. The advocate will assist any student who may have questions regarding these rights. The Director for Equity and Compliance/Title IX Coordinator has been designated in this role. Students who need assistance with their rights to accommodations should contact them at 610-436-2433.

EXCUSED ABSENCES POLICY

Students are advised to carefully read and comply with the excused absences policy, including absences for university-sanctioned events, contained in the WCU Undergraduate Catalog. In particular, please note that the "responsibility for meeting academic requirements rests with the student," that this policy does not excuse students from completing required academic work, and that professors can require a "fair alternative" to attendance on those days that students must be absent from class in order to participate in a University-Sanctioned Event.

REPORTING INCIDENTS OF SEXUAL VIOLENCE

West Chester University and its faculty are committed to assuring a safe and productive educational environment for all students. In order to comply with the requirements of Title IX of the Education Amendments of 1972 and the University's commitment to offering supportive measures in accordance with the new regulations issued under Title IX, the University requires faculty members to report incidents of sexual violence shared by students to the University's Title IX Coordinator. The only exceptions to the faculty member's reporting obligation are when incidents of sexual violence are communicated by a student during a classroom discussion, in a writing assignment for a class, or as part of a University-approved research project. **Faculty members are obligated to report sexual violence or any other abuse of a student who was, or is, a child (a person under 18 years of age) when the abuse allegedly occurred to the person designated in the University Protection of Minors**

Policy. Information regarding the reporting of sexual violence and the resources that are available to victims of sexual violence is set forth at: <https://www.wcupa.edu/admin/diversityEquityInclusion/sexualMisconduct/default.aspx>

EMERGENCY PREPAREDNESS

All students are encouraged to sign up for the University's free WCU ALERT service, which delivers official WCU emergency text messages directly to your cell phone. For more information, visit www.wcupa.edu/wcualert. To report an emergency, call the Department of Public Safety at 610-436-3311.

ELECTRONIC MAIL POLICY

It is expected that faculty, staff, and students activate and maintain regular access to University provided e-mail accounts. Official university communications, including those from your instructor, will be sent through your university e-mail account. You are responsible for accessing that mail to be sure to obtain official University communications. Failure to access will not exempt individuals from the responsibilities associated with this course.