

BSC4055/ZOO4926: Climate Change and Human Systems: One Health

SPRING 2023

CLASS MEETING AND TIME:

MWF Period 5 (11:45-12:35) Bartram 0211

Instructor

Stephen Mulkey, PhD

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Office: 621 Carr Hall

Please contact through the Canvas website

Office Hours: By appointment through Zoom

Phone: 208.596.3234 (Please use respectfully and protect my privacy)

Please contact through the Canvas website. Use regular email for personal questions such as grades, special circumstances, and needed accommodations.

Course Website

<http://elearning.ufl.edu/> Class material including the syllabus, weekly comprehension quizzes, exam results, lecture slides, and other information related to the course will be posted on the course e-Learning website. **The course lectures will not be recorded so long as the course meets face-to-face in the classroom.** A pdf of each lecture is provided with each module. You are responsible for all announcements made in lecture and those posted on the course website. For help with e-Learning, call the UF Computing Help Desk at 352.392.4357, or visit the e-Learning support website: <https://lss.at.ufl.edu/help.shtml>

Course Communications

Please use the Canvas Mail Tool. Inquiries received Mondays through Fridays will usually receive a reply with 24 hours of receipt; however, if you have not received a reply within 48 hours, please resend your inquiry. Inquiries after 10 pm will not be answered until the following day. Inquiries on the weekend will answered only if I have time.

Optional References

There is no formal textbook for this course. The lectures and associated materials from the peer reviewed literature are the source materials. The books below should be regarded as optional references. Exams *will not* be drawn from these references.

Global Climate Change and Human Health: From Science to Practice 2nd Edition. Knowlton et al. 2021 ISBN: 9781119667957

Climate Change and Population Health. Sarfaty. 2020. ISBN: 1284170209

Climate Change and Public Health. Levy & Patz. 2015. ISBN: 9780190202453

Additional Resources

Additional readings are included through the Canvas pages for each week and through the [UF Library](#). Do not use the Library Proxy system except for periodicals such as the *Washington Post* or *NYT*. For all peer-reviewed literature I recommend that you use [UF VPN](#) and bypass the cumbersome UF Library proxy system. Using UF VPN makes UF your virtual domain and provides access to all UF subscriptions. If alternative accessible versions of these resources are needed for any reason, please contact me and I will provide accommodations.

Course Description

The course will use principles derived from climate science, basic medical science, ecology, and relevant social science to describe the major factors and their combined effects of climate change on human health and wellness. Natural sciences, social sciences, the humanities, and the [scientific method](#) will provide the basis for understanding [sustainability science](#) as a framework for mitigation and adaptation of the disruption of the Earth System and impacts on living systems and human wellbeing.

Prerequisite Knowledge and Skills

BSC2011 and BSC2011L with minimum grades of C. This pre-requisite will be waived only in specific, compelling circumstances. I recommend that you be able to communicate clearly, concisely, and comprehensively through written exposition. *Exams are long format essay exams*. These will require you to develop thoughtful essays that are developed with considerably more information than is typical of a short answer or short essay format.

Course Objectives

By the end of this course, students will be able to:

1. Apply knowledge of how climate change affects living organisms and human mortality and morbidity.
2. Describe direct impacts of climate change related to air quality, vector borne diseases, water and food borne diseases, and mental health and violence.
3. Describe compound impacts of climate change related to extreme temperatures, extreme weather events, nutrition and food security, and land use amplification of disease.

4. Use peer-reviewed literature as a foundation for communicating about climate change and human wellness.
5. Analyze the emergency nature of climate change, the utility of proposed mitigation techniques and implications for public health and community management of public health.

Instructional Methods

Under the requirements imposed by the State of Florida instruction is required to be in person in the classroom at the designated meeting times and place. Students will be expected to review and synthesize these materials to participate fully in course assignments, quizzes, exams, and discussions, I request and expect students to always wear masks when in the classroom. *In person lectures will not be recorded and class attendance is essential.*

Expectations

This course has high standards for student scholarship and critical thinking. Each student is solely responsible for reading and following the instructions, guidelines, and schedules in this syllabus, on the course webpage, or announced in class. Independent research by students and collaboration with a group will be significant portion of assessment. Not having read or followed the instructions will not constitute an excuse for missing an assignment, exam, or other assessment. Please set your preferences in Canvas so that you receive timely notifications of course announcements and other information. Check Announcements in Canvas regularly as e-mail notifications from Canvas do not always go through.

As presently mandated by the State of Florida, this course will meet face-to-face. No recordings will be made of the lectures. Class attendance is essential but ultimately your choice. Do not inform me when you will be missing class for a sports event or by personal choice. See below for attendance rules for mandated class activities including exams.

I am happy to answer your questions, but I would appreciate it if you would use this syllabus first. When you have a question, check the following sources first to see if it is already answered, before e-mailing me:

- Course Syllabus
- e-Learning announcements (this is the primary means that I have to communicate with you in a timely manner)
- e-Learning Discussion General Posts

If you still cannot find the answer to your questions:

- If it is a question that others might find useful to know the answer to as well, post it in the e-Learning Discussion section.
- If it is a question specific to you (e.g., account or grade specific), e-mail Stephen. Barring unusual circumstances, expect a reply within 24 hours (Monday through Friday). E-mails

and e-Learning Discussion posts are checked at least once per day, but sometimes not more than that.

A Promise to You

If you regularly attend lectures, turn in the assignments on time, and interact with me and your classmates, you will do very well in this course. The amount of material can be daunting. It is my job to make this material accessible and help you work your way through the modules. Please keep me informed of your individual progress and alert me if you need help. Lectures are given in person and will not be recorded for class use. I may from time to time record a lecture on my phone as a legal record. If I do this, you will be informed as a class before I do so. *Absences due to COVID will be treated as any other excused absence due to sickness.* As per State of Florida law, you may record lectures on your personal recording device for personal use only.

Required Readings & Media

You are responsible for understanding all assigned readings and media. Not all reading and media materials will be covered in the course lectures.

Assignments/Quizzes/Exams

You are required to complete online quizzes and assignments. Please contact me if at any time you have questions about these assignments. A schedule will be posted on e-Learning with the due dates for each assignment. Most assignments are due by 11:59 P.M. (ET) on the date specified in the course schedule, usually a Sunday night, but not always. All assignments must be completed by the stated due date and time for full credit. Extensions will not be given because of technical or personal issues that occur within 24 hours of the assignment deadline. Many assignments will also have a set time limit, so make sure you have time to devote to that assignment before you begin. You are expected to work by yourself on the assignments and cheating will not be tolerated. Note that all due dates for assignments are clearly posted on course website and reflect the most up-to-date information.

Make-up Policy

Requirements for class attendance, make-up exams, assignments, and other work in this course are consistent with university policies that can be found in the [Undergraduate Catalog Academic Regulations](#).

Required Equipment

You must have a personal computer or laptop. This class depends on reliable internet connectivity. The download speed should be at least 50 mbs. This course cannot be reliably

accessed from your phone or a tablet because the webpages on canvas are not optimized for mobile devices. Contact me if you require special consideration with respect to equipment or its use in this course.

Zoom Conferencing

Zoom is a video conferencing tool that allows for screen sharing and real-time communication at a distance. It also allows for synchronous communication to be recorded for viewing later. View the [Zoom Privacy Policy here](#). I may occasionally use Zoom to deliver material outside of the regular lecture and discussion periods. If I become ill and contagious, but I am still able to be at my desk, your lectures will be delivered on Zoom until I am cleared to return to class.

Course Schedule spring 2023

Please read this: The lecture schedule will change periodically due to unfolding logistics as the course proceeds. Please check this syllabus on a regular basis. Unless stated otherwise all assignments are due on Sunday at 11:59 the week of the module where they appear. You are responsible for scheduling your time to avoid multiple assignments due at the last minutes. Unless otherwise specified, exams will be timed and become available in the morning on Thursday and are due by Friday at midnight of the week when they occur.

Module	Topic	Assignments
1	Anthropogenic climate change: Causes and process	Discussion 1 Quiz 1
2	Anthropogenic climate change: Impacts	Discussion 2 Quiz 2 Project part 1
3	Carbon cycle; Earth System models; Emissions	Discussion 3 Quiz 3
4	Overview of climate change and public health	Discussion 4 Quiz 4 Project part 2
5	Heat	Discussion 5 Quiz 5
6	Air quality	Discussion 6 Quiz 6 Project part 3

		Midterm exam possible questions 7 February
7	Vector borne disease	Discussion 7 Quiz 7
8	Water and food borne disease	Discussion 8 Quiz 8 Midterm exam 1 due 20 February
9	Risks and hazards	Discussion 9 Quiz 9 Project part 4
10	A primer on geoengineering	Discussion 10 Quiz 10
11	Agriculture; food and water security; nutrition security	Discussion 11 Quiz 11
12	Energy systems and the social costs of carbon; Economics	Discussion 12 Quiz 12 Midterm 2 exam questions available
13	Reality of the climate and health emergency	
14	Group Presentations	

Disclaimer: This syllabus represents my current plans and objectives as of 3 January 2022. As we go through the semester, those plans may need to change to enhance the class learning opportunities and meet logistics. Such changes, communicated clearly, are not unusual and should be expected.

Attendance

Attendance is expected and essential for success in this course. You should attend as often as you are able, but no attendance will be taken. If you are absent from class when an activity requiring your participation occurs, you will receive a zero grade for the activity unless the absence is *excused*. An absence is considered *excused* if there is an *acceptable reason* according to UF policy (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>). Examples of acceptable reasons are medical illness (including COVID positive test), religious holidays, military obligation, and the quarantine rule. Documentation of a religious holiday is not required. In all other cases, the following policies apply: It is your responsibility to notify me of an excused absence and to provide documentation of an acceptable reason. Otherwise, the absence will be considered *unexcused*. Whenever possible, notify the instructor by email prior to the absence, but do not notify me when you simply choose to not attend for logistical reasons or family matters. I should only be notified when you are ill or have a situation described above. When this is not possible (e.g., due to emergency or illness), I should be notified as soon as possible. I encourage you to read the assigned materials before coming to class as this will make it easier to comprehend the lecture material. If you miss class, visit the e-Learning site for any lecture notes and course announcements.

Grading and Assessments

EXAMS (25%): You will have two essay exams in this course, a First Midterm and Second Midterm Exam. The second exam will not be comprehensive, although it will draw on principles and materials developed throughout the course. There is no official final exam during the assigned final examination period provided by the Registrar. Both exams will be long-format essay based, wherein you will select from a list of topics and respond according to the prompts provided. You will be allowed 2 hours to answer the questions. A possible list of essay questions will be distributed no later than one week in advance of the exam date. I expect you to develop full essay responses to all of these questions. The exam questions will be chosen from these questions. Preparation for the exams should be based on review of the possible questions and your responses to each. You may have access to your prepared answers and to the internet during the timed exam. Exams are open-book and the internet/provided course resources may be used to develop your answers. I recommend that you answer all possible essay questions in advance and cut and paste your essays to the selected questions into the exam.

Your answers must be in your own words and must reflect scholarship as well as comprehension and synthesis. When you can, cite a reference in the text of your answer, but complete citation is not necessary. You will not be assessed on use of language or grammar, but proper use of scientific terminology is important. Your clarity of communication is important. The grading rubric is included in Canvas.

*PLEASE be aware that answers to these questions must be fully developed with sufficient detail to demonstrate your understanding of literature and the lectures. Answers to the exam questions are **not brief essays** that you may have been asked to provide in other courses.*

Provide a synthesis and context for your answer at the end of your essay.

TERM PROJECT WITH GROUP (40% divided in the following parts): Each group will be assigned to a theme for development within Canvas. Each member of the group will select an aspect for construction of an annotated bibliography and peer-reviewed presentation. Each of you will write a final report with citations on the entire group project summarizing the primary results in your own words.

- Part 1: Submission of group selection of subtopic/theme for each group member. Submitted by one group member.
- Part 2: Submission of individual topic description (1-2 paragraphs) of each topic chosen by group members. Submitted by each group member.
- Part 3: An annotated bibliography written by each individual on one of the assigned individual topics within a theme. Submitted by each group member.
- Part 4: Group presentation developed by all group members delivered by 2 or 3 members.
- Part 5: Provide feedback to two peers based on criteria provided in Canvas.
- Part 6: Submit final project report written by each individual in their own words drawing on the collective literature reviewed by the group. Submitted by each group member.

More detailed instructions are posted separately for each aspect of the assignment. A more detailed review of these requirements has been posted to the course website.

QUIZZES (15%): Module comprehension quizzes will be given online and provide you with an opportunity to apply what you have learned in the module. You are encouraged to seek out correct answers from the module content and activities. The module quizzes should be used to gauge and assess your comprehension of course materials and concepts and prepare for your First and Second Midterm Examinations.

- Quizzes have 20 multiple choice questions and two short answer essay questions based on the literature.
- The time limit is 70 minutes, and you will have only one attempt for each quiz. You may use your notes.

- After you have submitted the quiz, your graded responses along with the correct answer will be available for the multiple-choice part of the quiz. The essay part of the quiz will be graded within a week of submission.

Please submit the quiz by the due date. Specific due dates are listed in Canvas, and all quizzes are due by **11:59 PM (ET) on Sundays or the specified due date**, usually but not always on Sunday.

Please allow five business days from the due date for quiz feedback on free-response questions. Instructor comments will appear on the right side. Contact me via the Canvas Mail Tool to clarify any questions or quiz responses.

DISCUSSIONS (15%): There are several modules having discussion forums. These are opportunities to extend what you have learned in the same module. Students are expected to adhere to professional etiquette/netiquette standards as outlined above (see UF Policies) in all posts and to engage in constructive dialogue.

You are expected to contribute your thoughts about one of the topics available in each module as indicated in the Assignments portion of Canvas. Each discussion is worth 10 points. *You will receive 6 points for your original and thoughtful contribution, and 4 points for responding to at least two of your peer's posts. Posts are expected to be thoughtful, detailed responses (i.e., "yes," "no," "good job," "I agree," or "I disagree" answer is not sufficient).*

See the rubric attached to each discussion for additional grading criteria.

In most cases, discussions require some research or reading before initial post. For discussion forum assignments, **timeliness is critical**, and due dates should be adhered to. Please check the course schedule for the specific due dates.

OUTSIDE SPEAKER EVENTS (5%) There will be many opportunities to virtually attend outside speaker events during this semester. Please attend in person or via Zoom recording at least four of these and follow the directions for submission of your review as an assignment. I will announce many of these as they become available, but you are welcome to propose your own. Note that these talks must be science based and delivered by a recognized expert. Many IFAS Extension talks are excellent, but some target a lay audience and contain only minimal science. Talks in Sustainability Studies should be critically evaluated and cleared by me before you submit them for a grade.

COURSE GRADING:

Assessment	Points	%
Exams (2@100 pts each)	200	25
Online quizzes (12@20 pts each)	240	15
Online discussions (12@10 pts each)	120	15
Outside speakers (4@10 pts each)	40	5
Description of subtopic	10	2
Draft of annotated bibliography	20	2

Final annotated bibliography	100	12
Presentation by group on term project	100	12
Peer review of presentations (2@25 pts each)	50	2
Final project report	100	10
Totals	990	100

Note that the current UF policy for assigning grade points is available at the following undergraduate catalog web page: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

GRADING SCHEME:

A	100 %	to 94.0%
A-	< 94.0 %	to 90.0%
B+	< 90.0 %	to 87.0%
B	< 87.0 %	to 84.0%
B-	< 84.0 %	to 80.0%
C+	< 80.0 %	to 77.0%
C	< 77.0 %	to 74.0%
C-	< 74.0 %	to 70.0%
D+	< 70.0 %	to 67.0%
D	< 67.0 %	to 64.0%
D-	< 64.0 %	to 61.0%
E	< 61.0 %	to 0.0%

Note that the current UF policy for assigning grade points is available at the following undergraduate catalog web page: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

Students Requiring Accommodations

Students with disabilities requesting accommodations for online programming should first register with the Disability Resource Center (352-392-8565, <https://www.dso.ufl.edu/drc>) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Course Evaluation

Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at <https://evaluations.ufl.edu/evals>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results/>.

University Honesty Policy

UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (<https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class. This course will use Turnitin to identify plagiarizing.

In-Class Recording (the following statement is required by state law)

As required by state law, students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third-party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of

action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Student Privacy

There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see: <http://registrar.ufl.edu/catalog0910/policies/regulationferpa.html>

Academic Resources for Getting Help

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352- 392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

Use and Commercial Sale of Course Lectures

The content presented in the class is the property of UF and may not be duplicated in any format without permission from UF and may not be used for any commercial purposes. Students violating this policy may be subject to disciplinary action under the UF Conduct Code.

No part of the PowerPoints or other instructional content posted on Canvas may be reproduced, shared, or posted in any form outside of the class without permission in writing from Stephen Mulkey. Please see statement above regarding in-class recording by students.

Resources

Journals*

[Climatic Change](#)

[Climate Risk Management](#)

[Earth's Future](#)

[Ecology and Society](#)

[GeoHealth](#)

[Global Environmental Change Nature](#)

[Nature](#)

[Nature Climate Change](#)

[Nature Communications](#)

[Proceedings of the National Academy of Sciences US](#)

[Science](#)

[Science Advances](#)

[Scientific Reports](#)

[Sustainability Science](#)

[The Lancet Planetary Health](#)

*All are freely available if accessed from UFL.EDU or through UF Library as proxy. I strongly recommend that you use [UF VPN](#) to access articles behind a paywall. This is much more direct than using the UF Library proxy.

Sources of Literature Reviews and Assessments

US Climate Resilience Toolkit. <https://toolkit.climate.gov/tools>

US Global Change Research Program overview of resources <https://www.globalchange.gov/browse>

US Global Change Research Program report on human health <https://www.globalchange.gov/browse/reports/impacts-climate-change-human-health-united-states-scientific-assessment>

UN Intergovernmental Panel on Climate Change (IPCC) <https://www.ipcc.ch/>

UN Development Program for Climate Change Adaptation. <https://www.adaptation-undp.org/resources/featured>

About Stephen Mulkey: Stephen Mulkey is an environmental scientist dedicated to developing undergraduate and graduate programming to build society's capacity for environmental mitigation, adaptation, and resilience. Mulkey was the president of Unity College in Unity, Maine from 2011 through 2015. His leadership and forward-looking vision resulted in Unity College being the first college in the U.S. to divest its endowment from the top 200 fossil fuel companies, and the first college in the U.S. to adopt sustainability science as the framework for all academic programming. Mulkey believes that higher education has an ethical duty to prepare generations of graduates for the extreme sustainability and climate change challenges of this century. During and after earning his PhD at the University of Pennsylvania, he spent over twenty years as a tropical forest ecologist affiliated with the Smithsonian. Mulkey has served as tenured faculty at three doctoral granting universities, as science advisor to the state of Florida, and as a program officer at the National Science Foundation.

You can see more of my writings at environmentalcentury.net

Letters of Recommendation: *Do not request a letter of recommendation unless you have cultivated a professional relationship with me.* Getting an A in my course is not sufficient. I need to know much more about your professional development before I can write a meaningful letter.