

BSC3307C: Climate Change Biology

Fall 2025 | 4.00 credits

I. General Information

Meeting days and times: online

Class location: online

Instructor

Name: Stephen Mulkey, PhD

Office Building/Number: 621 Carr Hall

Phone: 208.596.3234

Email: smulkey@ufl.edu

Office Hours: TBA one evening per week, determined by class availability and by appointment

Course Description

Climate change and its impacts on biological communities, feedback from the biosphere to the climate system, and human impacts on the carbon cycle. Emphasis on the response of vegetation to climate change and rising atmospheric CO₂ concentrations, and the role of terrestrial ecosystems in regulating climate via the carbon cycle. The definition of the carbon cycle and types of emissions can be found at <https://www.globalcarbonproject.org/>

Prerequisites

BSC 2011 and BSC 2011L with minimum grades of C.

General Education Designation: none.

Course Materials

Materials will be available through the following means:

All materials will be linked via the course Canvas pages. This includes Required, Recommended, and supporting literature, as well as module introductions and lectures.

Course Communications

Please use the Canvas Inbox Tool. Inquiries received Mondays through Fridays will usually receive a reply within 24 hours of receipt; however, if you have not received a reply within 48 hours, please resend your inquiry.

Materials Fee: none

II. Course Goals

Course Objectives

- This course explores the causes and impacts of anthropogenic climate change on living systems.
- We will study global, national, and regional trends in climate impacts on species and ecosystems.
- The course is taught at an advanced level using peer-reviewed scientific literature from a wide range of topics central to understanding climate change and its effects on living systems.

Student Learning Outcomes

A student who completes this course will be able to:

1. Apply knowledge of how climate change and living systems interact at the organismal, species, ecosystem, biome, and planetary levels of organization.
2. Describe markers of climate change related to biogeochemical cycles, species survival, and shifting ecosystems.
3. Use peer-reviewed literature as a foundation for communicating about climate change and living systems.

Statement required by state law: Instructional materials for this course consist of only those materials specifically reviewed, selected, and assigned by the instructor. The instructor is only responsible for these instructional materials.

UF VPN

VPN is essential for your success in this course if you access posted materials from off campus. You should install and learn how to use [UF VPN](#) on your personal computer. This will allow you access to all UF Library holdings directly from the journal publisher when you are not on campus. This is an essential tool for scholarship and will be necessary when you take the exams. (The UF Library proxy service is confusing and often fails to link to a publication directly. It is time-consuming, and I don't recommend it.)

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 a significant portion of the assessment. Not having read or followed the instructions will not constitute an excuse for missing an assignment, exam, or other evaluation. 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.

You should not turn in assignments from an Android or iOS device, such as a phone or tablet. Canvas does not support an app for these devices. UF IT does not support any apps for these devices. The reason for this restriction is that Canvas does not reliably retain documents from these devices. If your assignment is lost and you turned it in from a mobile platform, I will not try to retrieve it. Note that the time stamp on the submission indicates the platform used.

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 promptly)
- e-Learning Discussion General Posts

If you still cannot find the answer to your questions:

- If it is a question that others might find helpful 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 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. Thus, attendance at lectures is critical for your success. Please alert me if you need help. 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 per State of Florida law, you may record lectures on your recording device for personal use only.

Deadline Extension Policy

A health or family emergency is grounds for an extension. Extensions may also be granted for other reasons and planned required absences (e.g., medical procedures). Please understand

that it is not my professional role to determine if your personal issues warrant an extension. If I grant an extension, please respond and provide a date by which a specific assignment will be turned in.

III. Use of Generative AI

Generative AI has certain limitations that will not allow you to pass a long-format essay exam in this course. These limitations will also cause your effort to fail when applied to Discussion assignments. For instance, recent research in the literature is often not accurately represented in AI-generated answers. AI is unlikely to give appropriate responses that reflect your personal experience. AI is also subject to hallucination. The following guidelines will help you decide how and when to use AI.

If I find that you have used generative AI on any key assignment in the course, you will get no points for that assignment. It will be treated as plagiarism. If you violate this policy more than once, I will report you as violating the UF Honor Code.

For exams, I will use one of several ChatGPT detection programs if I suspect that you have misused Generative AI. I may suggest that you meet with me and defend your submission before I assign a grade.

To justify your writing process, I recommend saving a copy of the Track Changes used during your exam editing.

The use of AI tools (e.g., ChatGPT, Dall-e, Grammarly, etc.) is permitted for:

- Brainstorming and refining your ideas
- Fine-tuning your research questions
- Drafting an outline to organize content
- Checking grammar and style.

When you use AI to develop research for your essay or discussion assignment, you must cite it. Here are some suggestions for how to cite AI:

1. Acknowledge AI assistance clearly

At the end of your essay or in a footnote, include a brief disclosure. For example:
“AI Disclosure: I used ChatGPT (OpenAI, 2025) to help brainstorm ideas and rephrase sentences in this essay.”

Format your citation like any other outside source. Examples in different styles:

- **APA:**
OpenAI. (2025). *ChatGPT* (July 17 version) [Large language model].
<https://chat.openai.com/>

- **MLA:**
OpenAI. *ChatGPT*, July 17 version, 2025, <https://chat.openai.com/>.
- **Chicago:**
OpenAI. *ChatGPT*. July 17, 2025. <https://chat.openai.com/>.

2. Specify what the AI was used for

Be transparent: brainstorming? Grammar help? Outlining?

The use of generative AI is NOT permitted for:

- Impersonating you on Discussion boards
- Impersonating you on Long-format Essay Exams
- Impersonating you on the Final Report
- Writing sentences, paragraphs, or papers to complete assignments

IV. Graded Work

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

Graded Components

Exams (25 %): You will have two Exams in this course, one Midterm and one Final Exam. Both will be essay-based, wherein you will select from a list of topics and respond according to the prompts provided. You will be allowed 200 minutes to answer four long-format essay questions. A list of eight possible essay questions will be distributed at least two weeks in advance of the exam date. The four exam questions will be chosen from the following options. Preparation for the exams should be based on a review of the possible questions and an outline of your answer for each. You may have access to your outlines during the timed exam. Exams are open-book, and the internet and provided course resources may be used to develop your answers. Your answers must be in your own words and must reflect scholarship as well as comprehension and synthesis.

Cite a reference in the text of your answer as author and date only. At the end of your essay, provide a section on references cited. This should include any application of AI that you find necessary to cite.

You will not be assessed on the use of language or grammar, but clarity and proper use of scientific terminology are essential. The grading rubric is included in Canvas. You should be aware that answers to these questions should be fully developed with sufficient detail to demonstrate your understanding of the literature and the lectures. Answers to the exam questions are not brief essays that you may have been asked to provide in other courses.

Quizzes (25 %): Module Quizzes 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 Midterm and Final Examinations. o Quizzes have 20 multiple-choice questions and two short-answer questions. The time limit is at least 60 minutes, and you will have only one attempt for each quiz. You may use your notes. o 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. 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 the specified due date. 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 the instructor via the Canvas Inbox Tool to clarify any questions or quiz responses.

Term project (25 %): Your membership in a group will be assigned by Canvas. The purpose of having groups is to ensure that each of you has a unique term project. The only job of the designated group leader is to check for topic overlaps and alert the group members who are in conflict. Each group will be assigned to a theme for development within Canvas. Each member of the group will select an aspect for the construction of an annotated bibliography and a peer-reviewed presentation. Each of you will write a final report with citations for the primary results for your topic within the theme.

- Part 1: Submission of topic
- Part 2: Submission of topic description (1-2 paragraphs)
- Part 3: Annotated bibliography
- Part 4: Presentation
- Part 5: Peer review of two presentations
- Part 6: Final formal report

More detailed instructions are posted separately for each aspect of the assignment. To view the project requirements holistically, view the [Term Project Overview](#).

Discussions (15 %): There are several modules with 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. Posts are expected to be thoughtful, detailed responses (i.e., "yes," "no," "I agree," or "I disagree" answer is not sufficient). 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 posts by your peers. See the rubric attached to each discussion for additional grading criteria.

Discussions require some research or reading before the initial post. Follow-up posts are typically required. For discussion forum assignments, timeliness is critical, and due dates should

be firmly adhered to. Please check the course schedule for the specific due dates.

External media and synchronous tutorials (10 %): Determined by engagement with group projects, video quizzes, and synchronous tutorials. You must complete each video assignment by viewing the entire presentation and answering all associated questions by the assigned due date. Attending a live tutorial in person or via recording is worth 8 points and requires a report for each.

TOTAL: 100 %

Requirements for essays

1. **PLEASE** Avoid transitional phrases that take up space and word count. These include, *in conclusion, the points above, as stated previously. This is the case, and the following* points further support this. You find these phrases in high school essays, and they do not belong in university-level work. Before you use a transitional phrase or word, ask yourself, “Is this something the reader needs?” An essay that uses many of these phrases will receive much lower scores.
2. **Break your essay into parts** using several paragraphs to develop your answer. If you write as a stream-of-thought in one long paragraph, *you will likely fail the exam.*
3. The **Development** of your essay should reflect expanded descriptions of each paragraph. You must show that you have more than a superficial understanding of the topic. This is the most essential part of your essay.
4. **Synthesis** should reflect your thinking on the context and importance of the topic of the essay. This is where you mention your personal experience or the broader import of the topic. Synthesis is the second most crucial part of your essay.
5. Do not simply answer the numbered parts of the question. Write the essay from a holistic perspective and answer the numbered parts within this context. Do not provide numbers. Make the parts of your essay hang together as part of an overarching narrative.
6. **Most important: Use declarative, active voice, fact-based, descriptive sentences.**

Grading Scale

Letter Grade	Number Grade
A	100-92.5
A-	92.4-89.5
B+	89.4-86.5
B	86.4-82.5
B-	82.4-79.5
C+	79.4-76.5
C	76.4-72.5

Letter Grade	Number Grade
C-	72.4-69.5
D+	69.4-66.5
D	66.4-62.5
D-	62.4-59.5
E	59.4-0

See the UF Catalog's "[Grades and Grading Policies](#)" for information on how UF assigns grade points.

V. Calendar

Module	Topic	Activity	Due Dates
21 August	Orientation and syllabus	Orientation video and quiz	23 August
1 24 August	Climate change causes and processes	Survey for live session time	24 August
		Discussion External media quiz Quiz	31 August
2 31 August	Climate change impacts	Discussion Live session exposition External media quiz Quiz	7 September
3 7 September	Models, emissions, carbon cycle	Discussion Live session exposition External media quiz Quiz Project part one	14 September
4 14 September	Impacts on species distribution and abundance	Discussion Live session exposition Quiz	21 September
5 21 September	Phenological responses	Project part two Midterm exam study guide available	23 September
		Discussion Live session exposition External media quiz Quiz	28 September
6 28 September	Disrupted ecosystems	Discussion Live session exposition External media quiz Quiz	5 October
7 5 October	Paleoclimate	Discussion Live session exposition External media quiz Quiz Note project part 3 due 27 October	12 October
8 12 October		Midterm exam	20-23 October

		Discussion Live session exposition External media quiz Quiz	19 October
		Finalize project part 3	
9 19 October	Land use and land cover change	Discussion Tutorial exposition External media quiz Quiz Mid-semester report Project part 3 Finalize project part 4 due on 6 November	26 October
10 26 October	Climate change and human health	Discussion Live session exposition External media quiz Quiz	2 November
		Project part 4	6 November
		Begin project part 5	
11 2 November	Conservation	Discussion Live session exposition External media quiz Quiz Project part 5	9 November
12 9 November	Climate interventions	Discussion Live session exposition External media quiz Quiz Peer reviews due	16 November
13 16 November	Climate change mitigation	Discussion Live session exposition External media quiz Quiz	23 November
		Second midterm exam	30 November - 3 December
Final report			8 December

VI. University Policies and Resources

Attendance policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at:

<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>.

Students Requiring Accommodations

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center. See “Get Started With the DRC” Disability Resource Center webpage (<https://disability.ufl.edu/get-started/>). Students need to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

Course Evaluation

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete the assessment in three ways: [1] The email they receive from GatorEvals; [2] Their Canvas course menu under GatorEvals; or [3] The central portal at <https://my-ufl.bluer.com>. Guidance on how to provide constructive feedback is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-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 Conduct Code outlines several behaviors that violate this code, along with the possible sanctions. See the UF Conduct Code website (<https://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) for more information. If you have any questions or concerns, please consult with the instructor in this class.

In-class Recording

Although this course is delivered online, state law requires the following statements. All lectures, introductions, and evening synchronous sessions are recorded and available on the course website.

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.

Procedure for conflict resolution

Any classroom issues, disagreements, or grade disputes should be discussed first between the instructor and the student. If the problem cannot be resolved, you may get in touch with the Associate Chair of Biology. Be prepared to provide documentation of the problem, as well as all graded materials for the semester. Issues that cannot be resolved departmentally will be referred to the University Ombuds Office (<http://www.ombuds.ufl.edu>; 352-392-1308) or the Dean of Students Office (<http://www.dso.ufl.edu>; 352-392-1261).

Student Privacy

There are federal laws protecting your privacy about grades earned in courses and on individual assignments. For more information, please see: (<https://catalog.ufl.edu/UGRD/academic-regulations/ferpa-confidentiality-student-records/>)

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.

Academic Resources: 1317 Turlington Hall. The mission of Academic Resources at the University of Florida is to empower students to become successful lifelong learners. Through a variety of services and instructional approaches, CLAS Academic Resources seeks to help students enrolled in College of Liberal Arts and Sciences courses master effective ways of learning for different disciplines. Services include tutoring, supplemental instruction, standardized test preparation, and language support.

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

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

Health and Wellness

If you have or develop a chronic health issue during the semester that affects academic performance, you should process your concerns with DRC. If you have a DRC letter, then it must be brought to my attention early in the semester. I will not make retroactive assignment extensions.

UF Dean of Students Office - U Matter, We Care: If you or someone you know is in distress, please get in touch with umatter@ufl.edu, 352-392-1575, or visit the 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.