

## **BSC 2862 Syllabus**

### **Global Change Ecology and Sustainability**

**Class Periods and Location:** Tuesday Period 6 (12:50-1:40) CSE E121; Thursday Period 6 (12:50-2:45) TUR L007

**Academic Term:** spring 2022

#### ***Instructor***

Stephen Mulkey, PhD

[smulkey@ufl.edu](mailto:smulkey@ufl.edu)

Office: 621 Carr Hall

*Please contact through the Canvas website*

Office Hours: By appointment in person and 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. 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 Description and Objectives***

This course uses ecological principles and processes to describe the major anthropogenic changes that are occurring globally, regionally, and locally. Fundamental concepts include changes in land use, alterations in the major elemental cycles (water, nitrogen, phosphorus, and carbon), climate change, redistribution of species, ecosystem disruption, loss of biodiversity and extinctions, and the threat of climate and biosphere disruptions to human civilization. We consider best management practices, technologies, policies, and human behaviors that can mitigate negative human impacts on the climate and biosphere and promote sustainability. Natural science and the [scientific method](#) will provide the basis for understanding [sustainability science](#) as a framework for mitigation and adaptation. The humanities and social sciences will contribute to our understanding of how we engage with the biosphere. The course includes critical analysis of global neoliberal economics and its impacts on our home and future.

Objectives of the course will be achieved if, by its conclusion, students can:

- identify the major factors that influence land use change, alteration in water, nutrient, and carbon cycles, climate change, redistribution of species, and extinctions on a global scale.

- compare different practices, technologies, policies, and human behavior that can promote sustainability.
- provide cogent scientifically based criticisms of economics,
- have sufficient ecological literacy to apply basic concepts of ecology to understand human impact on global systems.
- be able to explain in detail why climate change is a threat to civilization.
- identify the major carbon processes driving climate change and be able to explain why the living biosphere and the climate system are interdependent and must be managed as an integrated Earth System.

### ***Course Communications***

Please use the Canvas Inbox 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.

### ***Suggested Optional Textbook***

*Environment and You*. 2018. Christensen. Edition 3. Pearson. ISBN-13: 978-0134646053

The text by Christensen et al. is available for those who would like a more detailed development of the principles of ecology and sustainability. I have posted this to the textbook adoption page, and it is suggested for its high quality. Affordable used copies are available. Please get the version that is easiest for you to acquire. Exams will be entirely essay and based on lectures and assigned readings. There will be no assigned readings from this text.

### ***Additional Resources***

Additional readings and media are included through the Canvas pages for each week through the [UF Library](#). For resources unavailable through the UF Library, PDF documents have been provided. If alternative versions of these resources are needed for any reason, please contact your instructor and accommodations will be provided.

### ***UF VPN***

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.

### ***Expectations***

This course has high standards for student creativity and scholarship. 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 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.

***This course will meet face-to-face and no recordings will be made of the lectures. Class attendance is essential.***

When you have a question, check the following sources first to see if it is already answered, before e-mailing your instructors:

- Course Syllabus
- e-Learning announcements (this is the primary means that your Instructor has 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. I will help you as 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.

### ***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***

As part of BSC2862 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 50mbs. 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 at a later time. View the [Zoom Privacy Policy here](#). We may occasionally use Zoom to deliver material outside of the regular lecture and discussion periods. Instructions for use will be posted to Canvas.

### ***Course Schedule spring 2022***

**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. 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. Note that chapters are referenced only if you choose to use the optional text as a reference for developing further comprehension. See the module pages for assigned and optional readings.

Module	Topic/Activity	Readings & Media	Exam / Assignment
Module 1	Introductory lecture: Reality and Responsibility in the Anthropocene: An overview of the issues	Generation Anthropocene Climate Adam: Hopes for our climate future How to (seriously) read a scientific paper	Required: Fill out your student profile and introduce yourself to the class on the Discussion board.  Take the <a href="#">orientation quiz</a> .
Module 2	Intro continued; Biomes and biogeography	-Terrestrial biomes -Atmospheric circulation -Life in Biosphere 2	Quiz 1 Discussion 1
Module 3	Evolution, ecology, and demography	-Survivorship -Human population growth -Mechanisms of evolution -Population ecology	Quiz 2 Discussion 2
Module 4	Biodiversity & extinction	-Madagascar -Value of nature -Biodiversity review	Group project subtopics Discussion 3

Module 5	Communities & ecosystems	<ul style="list-style-type: none"> <li>-Competitive exclusion</li> <li>-Predation</li> <li>-Symbiosis</li> </ul>	<p>Quiz 3</p> <p>Discussion 4</p>
Module 6	Climate change 1: Causes and processes	<ul style="list-style-type: none"> <li>-GHG emissions summary</li> <li>-How do we know?</li> <li>-The scientific consensus</li> </ul>	<p>Exam 1</p> <p>Quiz 4</p>
Module 7	Climate change 2: Impacts	<ul style="list-style-type: none"> <li>-Imperative to stabilize climate</li> <li>-Climate change and ecosystems</li> <li>-Hothouse Earth</li> <li>-Tidal flooding &amp; SLR</li> </ul>	<p>Draft of annotated bibliography</p> <p>Quiz 5</p>
Module 8	C, N, and water cycles  Group projects.	<ul style="list-style-type: none"> <li>-Water management Gainesville</li> <li>-The nitrogen crisis</li> <li>-How we wrecked the ocean</li> </ul>	<p>Discussion 5</p>
Module 9	Land use: Agriculture and forestry	<ul style="list-style-type: none"> <li>-Sustainable agriculture</li> <li>-Potential for global food crisis</li> <li>-Prescribed fire</li> <li>-Saving the rainforests</li> <li>-Ecology from the air</li> </ul>	

Module 10	Environmental change and human health	<ul style="list-style-type: none"> <li>-Climate change and health (<i>The Lancet</i>)</li> <li>-Air pollution</li> <li>-Mosquito-borne disease</li> <li>-Malaria</li> <li>-Mental health</li> </ul>	Exam 2
Module 11	Energy systems; Urban ecology & waste	<ul style="list-style-type: none"> <li>-Reinventing fire</li> <li>-Grid energy storage</li> <li>-Wind energy</li> <li>-Distributed solar PV</li> </ul>	<p>Quiz 6 due</p> <p>Discussion 6</p> <p>Final annotated bibliography</p>
Module 12	Natural climate solutions & geoengineering	<ul style="list-style-type: none"> <li>-Combining renewables with DAC</li> <li>-The ethics of removing CO<sub>2</sub></li> <li>-Social and health cost of carbon capture</li> <li>-100 solutions</li> <li>-Empowering women</li> </ul>	<p>Assignment of group presentation dates, Sunday midnight</p> <p>Quiz 7</p> <p>Discussion 7</p>
Module 13	Economics & ethics	Various media and readings	
	Group presentations and peer reviews		

	Group presentations and peer reviews		Exam 3
	Group presentation and peer reviews		
Conclusions	Group presentations and peer reviews	Rules of engagement for the environmental century	Peer reviews due
			Final project reports due

Disclaimer: This syllabus represents my current plans and objectives as of 31 July 2021. 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 absolutely essential for success in this course. 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, religious holidays, military obligation, and the twelve-day rule. For religious holidays, students are required to notify the instructor prior to the absence, but documentation of the religious holiday is not required. In all other cases, the following policies apply: It is your responsibility to notify the instructor 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. When this is not possible (e.g., due to emergency or illness), the instructor should be notified as soon as possible. You are strongly encouraged to read the assigned chapters 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.



## ***Exams***

There will be three long-essay exams during the semester. The exams are designed to ensure that you have developed an understanding based on systems rather than rote learning. There is no final exam. Exams will be administered during a specified window of opportunity via Canvas. As long-essay exams you should expect to write more than three short paragraphs as your answer to each essay question. You will receive a list of possible long-essay questions ten days in advance of the exam date. A subset of four questions will be drawn from this list and these will appear on the exam.

The long-essay exams are open book, open internet, and open lecture notes. You may not collaborate with each other in answering these questions. Your answers will be selected at random and reviewed for plagiarism by Turnitin. A successful strategy for these exams is to answer all possible questions in long-essay format and then simply cut and paste your answer into the exam space during the designated time for the exam. Finish your exam by editing your essays for clarity and content.

Students with documented need for extra time and resources will be accommodated (see below).

No additional time will be given to complete an exam if you start the exam late. If necessary to reflect class performance, exams will be curved and normalized to a scale of 0 to 100 after the distribution of scores has been assembled. Review of your performance on an exam will be available by appointment two weeks after the date of the exam. Exams will not be available for review after the semester has ended.

No make-up exams will be given without prior permission or documentation of illness. Students that will be missing an exam due to a prearranged university-approved excused absence (sports, etc.) should let me know a minimum of two weeks in advance. These students may be required to take the makeup exam before the scheduled in-class exam.

In case of illness during the time that the exam is available, a letter from the student's primary care provider is required. This letter must state that the student was unable to complete the exam on the scheduled date (i.e., a letter stating only that the student was seen in a clinic is not sufficient). A personal matter requires a note from the Dean of Students. These notes must be received within five business days after the exam. Make up exams may be short-answer or essay format.

Long-essay exams will require at several days for me to grade. Please be patient while I carefully read and evaluate your answers. A grading rubric is provided for these exams, and I advise you to carefully read and understand the criteria for grading.

## ***Comprehension Quizzes***

There will be 6 online quizzes to assess comprehension during the semester. You will be allowed two attempts for each question and the highest score received will be recorded for

that quiz. All quizzes must be completed by the stated date and time. Extensions will not be given because of technical or personal issues that occur within 24 hours of date of the quiz. Quizzes will have a set time limit. Students are expected to work independently on the quizzes and to not use notes.

### ***Term Group Project***

Each of you will be assigned a group by Canvas. Each group will pick from a limited number of themes for development as a research project. Each member of the group will select an aspect or topic that is part of the theme 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 theme for group to be submitted by each group member with Part 2.
- 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: Review with Caitlin or Stephen your plans for presentation by your group.
- Part 5: Peer presentation given by your group.
- Part 6: Provide feedback to two presentations based on criteria provided in the instructions.
- Part 7: Submit final project report written by each in their own words drawing on the collective literature reviewed by the group. Submitted by each group member.

More detailed instructions and deadlines are posted separately for each aspect of the assignment.

### ***Online Discussions***

Associated with selected modules I will pose 10 questions derived from the readings and lectures. Your online participation in these will be noted and recorded as part of your grade as indicated in the grading scale.

### ***Grades***

<b><i>Assessment</i></b>	<b><i>Points</i></b>	<b><i>Percentage weight of Final Grade</i></b>
In-class Exams (3 @ 100 pts each)	300	25
Online quizzes (6 @ 20 pts each drop lowest of 7)	120	10

Attendance at outside speaker events or video lectures (4 @ 5 pts each)	20	2
Online Discussions (8 at 10 pts each)	80	15
Presentation on Term Project	100	12
Annotated Bibliography on Term Project	100	12
Project Report Peer Review (2 @ 10 pts each)	20	4
Final Project Report	100	20
totals	840	100

### ***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***

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](mailto: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](mailto: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.

### ***Materials for Projects and Discussion***

#### ***Books and Essays***

*The Sixth Extinction: An Unnatural History*

Elizabeth Kolbert

Holt and Company 2014

ISBN-13: 978-1250062185

*Drawdown 2020: The Most Comprehensive Plan Ever Proposed to Reverse Global Warming*  
(download from website)

*Merchants of Doubt*

Naomi Oreskes and Erik M. Conway

Bloomsbury Press 2011

ISBN-13: 978-1596916104

*21 Lessons for The 21<sup>st</sup> Century*

Yuval Noah Harari

Spiegel & Grau 2018

ASIN: B079WM7KLS

*Sustainability Science*

Ariane König and Jerome Ravetz (eds.)

Routledge 2017

ISBN-13: 978-1138659285

*Thinking in Systems: A Primer*

Donella H. Meadows (author) and Diana Wright (editor)

Chelsea Green Publishing 2008

ISBN-13: 978-1603580557

*Silent Spring*

Rachel L. Carson

Houghton Mifflin Harcourt 2002 (Anniversary Edition)

ISBN-13: 978-0618253050

*The Unsettling of America: Culture and Agriculture*

Wendell Berry

Counterpoint 2015

ISBN-13: 978-1619025998

*Half-Earth: Our Planet's Fight For Life*

E. O. Wilson

Liveright 2017

ISBN-13: 978-1631492525

*Transitioning Toward Sustainability: Advancing the Scientific Foundation*

Brose, D. et al.

National Academies Press

ISBN 978-0-309-44375-3

*Sustainability Key Concepts 2nd Edition*

Leslie Paul Thiele

Polity Press

ISBN-13:978-1-5095-1106-8

***Journals\****

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

[Nature](#)

[Nature Communications](#)

[Science Advances](#)

[Scientific Reports](#)

[Earth's Future](#)

[Nature Climate Change](#)

[PLOS One](#)

[Global Change Biology](#)

[Ecology Letters](#)

[Environmental Research Letters](#)

[Trends in Ecology and Evolution](#)

[Sustainability Science](#)

[Biological Conservation](#)

\*All are freely available if accessed from UFL.EDU

***Sources of Literature Reviews and Assessment***

[US Global Change Research Program](#)

[Intergovernmental Panel on Climate Change](#)

[Skeptical Science](#)

**Letters of Recommendation:** *Please 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. A letter that simply recapitulates what can be read on your transcript will not help you with admission to professional school.*