SYLLABUS: CLIMATE CHANGE SCIENCE AND SOLUTIONS
Fall 2016 IUF2100/IDH3931

Lead Instructor: Dr Andrew Zimmerman, Department of Geological Sciences
Office: 364 Williamson Hall Ph# 392-0070 email: azimmer@ufl.edu Office meeting: by appointment

Wednesday 7-8 period (1:55-3:50 am), IUF2100 Sec 197A & IDH3931 sec2B53, Meeting: Weimer 1084
Section Instructor (Grad. TA): Carrie Schuman

Thursday 3rd-4th period (9:35-11:30 am), IUF2100 Sec 1988, Meeting: Matherly 14
Section Instructor (Grad. TA): Carla Alonso-Contes

COURSE DESCRIPTION

This course invites students to deepen their understanding of the practice of science by examining the complex issue of climate change. Working collaboratively and using the scientific method, we will explore the multi-disciplinary evidence behind climate change and its effects and develop potential novel adaptation and mitigation solutions and to communicate this work effectively.

Prerequisites: none **Credits:** 3 **Course Fee:** none **Gen. Ed. Fulfillment:** P

Course Objectives

This physical science general education course will cover concepts of climate change and science in our modern and global society. It is the aim of this course that by the end, students will be able to:

- Understand the basic facts and uncertainties regarding climate change and the role of humans in causing it.
- Understand how climate change affects natural and human systems and how these effects vary across nations and with socioeconomic factors and cultures worldwide.
- Apply the process of critical thinking and scientific inquiry in discovering, understanding, and addressing the challenges of climate change.
- Develop hypothesis-driven solutions to address climate change through critical evaluation and teamwork.
- Effectively communicate multi-disciplinary scientific challenges and strategies for addressing them.

Course Structure

The course will require both on-line and in-class participation. Each week, students will cover online content on their own time (about 2 hours total) that will include:

1) Completion of a 'Spark' Discussion (See due date in 'Weekly CCSS Due Dates' at end of syllabus)
2) Readings and on-line lectures
3) A quiz on the on-line materials (See due date in 'Weekly CCSS Due Dates' at end of syllabus)

Each week, in class, students will:

1) Take a team readiness assurance-test (t-RAT) and review on-line material
2) Complete an In-Class Activity that reinforces the 'Fundamental Science Topic' & 'Framework Topic' (see course schedule below). This is usually a group activity that will be turned in (via Canvas, one per group) by the end of the class meeting day.

In addition, students will work on a semester-long group project, both in and outside of class, which will, via hypothesis testing and quantitative analysis, develop a novel approach to addressing one a climate change-related problem. Students are required to bring a laptop or other web-enabled device (though use of a smart phone is not advised). Students are also required to participate in a midterm exam one evening of the semester.

COURSE WEBSITE and COMMUNICATION

Course Website

The course will run via **Canvas** (UF https://ufl.instructure.com/). The course site will be used to post relevant announcements, reading, lecture materials, links, assignments and quizzes, etc. You are responsible for checking this site for updates, announcements and to verify that your grades are recorded correctly. No grade will be changed more than one week following the due date for the assignment. It is recommended that students adjust Canvas settings so that Announcements are sent to phone or email. All communication with instructors should use the mail tool within this site.

Questions in regards to grades etc (e.g. medical emergency, legal, documented disability accommodation, etc.) should be sent to the TA who will forward these to the faculty instructor as necessary.

Required Textbook

Dire Predictions: Understanding Global Warming, by Mann and Kump, 2015, Pearson, 2nd edition ($16 new on Amazon, Kindle or at the UF bookstore for about $39). In addition, there will be numerous selected readings posted or linked through the course website weekly.

ASSESSMENTS AND GRADING

Final Grade Calculation

15%	Homework (individual):		
	3%	12 'Spark' Discussions (2 lowest dropped)	[0.3% = 3 pts each, 30 tot.]
	12%	12 Quizzes (2 lowest dropped)	[1.2% = 12 pts each, 120 tot.]
10%	In-class Quiz (group t-RAT), 12 quizzes, 2 lowest dropped		[1% = 10 pts each, 100 tot.]
25%	In-class Activities (group) 12 assignments, 2 lowest dropped		[2.5% = 25 pts each, 250 tot.]
5%	In-class Attendance (+homework, individual)		[50 pts. total]
30%	Final Project (group)		
		Initial Proposal (group assessment)	[3% = 30 pts]
		Hypothesis/Source (group assessment)	[3% = 30 pts]
		Quant. Method (group assessment)	[5% = 50 pts]
		Final Presentation (group assessment)	[8% = 80 pts]
		Final Paper (group assessment)	[8% = 80 pts]
		Effort (individual/team assessment)	[3% = 30 pts]
15%	Mid-term Exam* (Curved to a median of 85%, No Final Exam)		[15% = 150 pts]

Final Grade Scale

A = ≥93%, A- = 90-92.99, B+ = 87-89.99, B = 83-86.99, B- = 80-82.99, C+ = 77-79.99, C = 73-76.99, C- = 70-72.99, D+ = 67-69.99, D = 63-66.99, D- = 60-62.99, E < 60

***Note:** The midterm exam scores will be curved to a median of 85% using a linear method described here: http://www.ats.amherst.edu/software/excel/excel-grading/excel-grades/#CurvingGrades

***Note:** A grade of 'C-' or below does not qualify for major, minor, Gen. Ed., or college basic distribution credit.

Discussions
Students have 2-3 days from the end of class (See due date in 'Weekly CCSS Due Dates' at end of syllabus) to complete the on-line 'Spark' Discussion. Each student must make one substantive original comment and one substantive response to the comment of another student. That is, students must read what has been said before and add something more than a few words of agreement or disagreement. No credit will be given for late submissions.

Quizzes and Exams
Each week students must complete a time-limited (30 min.) quiz on Canvas by midnight of the day before class consisting of 12 multiple choice questions (open book) on all lecture and reading materials presented on-line that week. These quizzes cannot be made up or taken late if missed except in the case of an excused absence. (At 11:59 pm, the quiz will lock students out and unanswered questions will be marked wrong. So start by 11:30 p.m.)

At the start of class each meeting day, students will take a team-Readiness Assurance Test (tRAT) consisting of 3 - 8 multiple-choice questions based on the on-line material of that week. Some of these questions may have appeared in the Canvas Quiz of that week. Team answers will be recorded on scratch-off cards that will be provided (if the team does not uncover a correct answer, they continue to discuss the question and sequentially select other choices, but receiving progressively lower scores: 1/2 for 2 scratchs, ¼ for 3 scratchs). All team members present will receive the same score. These quizzes cannot be made up or taken late if missed except for because of an excused absence. Individuals (for quiz questions) or teams (for t-RAT questions) can submit a written appeal to their instructor for questions they feel may have a valid alternate answer.

The Midterm Exam will be given on campus in the evening of Monday Oct. 3 (7:20-9:10 pm), closed book. Students must bring a laptop to take the exam which will consist of about 50 multiple choice questions (some taken from quizzes, some new). Everything associated with the class up to the point of the exam (Weeks 1-6), including on-line material and in-class discussion/exercises, is fair game on the mid-term exam. If there is an issue with attending the exam at this time, it should be discussed with the TA at least one week prior to the date.

In-Class Activities
At each class meeting, there will be a team assignment (answer to questions, spreadsheet calculation, etc.) to be completed and turned in, usually via Canvas (Assignment Tab) by the evening of the day of class (11:59 pm). Exceptions may be granted by special arrangement with the TA. These assignments will not be accepted after 1 week following the class. Full credit will be awarded as follows:

- 4 points – Assignment was submitted by the due date (2 points if submitted within 1 day of due date)
- 7 points – Demonstrates complete competence in the terminology, concepts, methodologies and theories used within the subject area.
- 7 points – Critical Thinking: Carefully, logically, and fully analyzes information from multiple perspectives and develops reasoned solutions to problems within the subject area.
- 7 points – Communication: Clearly and effectively communicates knowledge, ideas, and reasoning in forms appropriate to the subject area.

Attendance
Worth 5% of your grade, attendance will be managed by the Canvas system. Also, 30% of the attendance score for a day will be deducted for lateness. Let your TA know about any excused absence/lateness and the Canvas score can be corrected. No corrections will be made more than 1 week after the absence/lateness event.

Semester Project
Students, in groups of 3-4, will be asked to work as a team to create and evaluate either a strategy to mitigate or adapt to climate change. The strategies will range widely, e.g., from a solar-powered bicycle to a change in international law. But we encourage student groups to consider a local or regional problem and solution. Each group will also quantitatively evaluate the cost and/or potential impacts that would result from the adoption of

their strategy. During the course of the semester, both lectures and sub-assignments will build students' skills and the knowledge base needed for this kind of problem solving. At the end, both an oral and a written presentation will be due. More details can be found on the course website.

Extra Credit/Field Trip

We will visit the Solar Park just south of campus (Solar Decathlon House, Solar array, Bioenergy Lab) on the afternoon of Friday Oct. 7 (likely). Those attending the field trip will receive 2.5% extra credit added to final grade tally. HOWEVER, if you commit to going but do not show up, I will deduct 0.5% from your final grade. Transportation will be provided.

The only other extra credit opportunity will be a survey about your views of science and climate change. If you complete BOTH an initial and final survey, you will receive a 1% addition to your final grade. You will receive announcements about this via e-mail (first and last week of the course).

COURSE AND UNIVERSITY POLICIES

Absence/Late Assignments

Students are expected to complete all requirements (quizzes, exams, presentation) on the specified dates and will not be granted an alternate date unless they have an acceptable reason for their absence (e.g., due to medical emergency, observance of religious holidays, military obligation, etc.) and pre-arranged consent of the instructor. These requests must be timely and accompanied by all necessary written documentation. This policy is accordance with UF's attendance policies, which can be reviewed further at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx. Quizzes and assignments completed late will suffer a loss of points spelled out in each section above (generally half off). No assignment can be turned in more than 1 week after its due date without instructor consent. Discussions cannot be completed late.

Grade Appeals

Students or student groups who feel that their quiz, discussion, in-class activity or semester project was graded unfairly or incorrectly should make an appointment with their TA to discuss the issue. If students are still dissatisfied with the resulting explanation or action, they should then make an appointment with the lead instructor to discuss the issue.

Classroom policy

Students are required to bring to each class meeting a laptop or similar device for use in taking notes, summarizing in-class activities, and accessing the Internet. However, use of mobile devices and computers during class for purposes other than viewing readings or conducting sanctioned research/communications is not allowed. Students who receive or make calls or text messages or engage in other disruptive behavior during class will be asked to leave will not be allowed to turn in the assignment due on that day.

Academic Honesty Policy

Students must conform to UF's academic honesty policy regarding plagiarism and other forms of cheating. This means that 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 university specifically prohibits cheating, plagiarism, misrepresentation, bribery, conspiracy, and fabrication. For more information about the definition of these terms and other aspects of the Honesty Guidelines, see http://www.dso.ufl.edu/sccr/process/student---conduct---honor---code/. All students found to have cheated, plagiarized, or otherwise violated the Honor Code in any assignment for this course will be prosecuted to the full extent of the university honor policy, including judicial action and the sanctions listed in paragraph XI of the Student Conduct Code. For serious violations, you will fail this course.

Software Use
All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Such violations are also against University policies so disciplinary action may be taken.

Accommodations for Students with Disabilities
Please do not hesitate to ask for accommodation for a documented disability. Students requesting classroom accommodation must first register with the Dean of Students Office (http://www.dso.ufl.edu/drp/). The Dean of Students Office will provide documentation to the student, who must then provide this documentation to the Instructor when requesting accommodation. Please ask the instructor if you would like any assistance in this process. Please provide this information to your TA within the first two weeks of the semester.

Instructor Evaluation
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. 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.

Drop/Add/Withdrawal
A student can drop/add during the drop add period with no penalty. After drop/add, a student who drops will receive a W until the date listed in the academic calendar. After that date, the student may be assigned an "E" (fail). Note: it is the responsibility of the STUDENT to withdraw from a course, not the instructor. Failure to participate/complete the class is NOT a drop.

Additional Resources
Students facing difficulties completing the course or who are in need of counseling or urgent help may contact the Counseling and Wellness Center: http://www.counseling.ufl.edu/cwc/Default.aspx, 392-1575; or the University Police Department: 392-1111 or 9-1-1 for emergencies.
Other Resources available on-campus for students include:

a. Student Mental Health, Student Health Care Center, 392-1171, personal counseling;
b. Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual counseling;
c. Career Resource Center, Reitz Union, 392-1601, career development assistance and counseling.

Generic Week Schedule/ Due Dates*

FOR WED CLASS:

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		Finish module **Quiz due 11:59 pm**	**Class 1:55 pm** **ICA due 11:59 pm**		**Spark Discussion due 11:59 pm**	

*this does not include due dates of assignments relating to the Semester Project, Midterm Exam or Field Trip

Fall 2016 COURSE SCHEDULE

Week Of:	Week #		Fundamental Science Topic	Framework Topic	Other Activities	Reading in 2nd Ed. *Dire Predictions* pgs.
21-Aug	1	Introduction to climate and CC	Disciplines of climate change	Interdisciplinary Science		
28-Aug	2		Climate Drivers	Scientific Method		6-29
4-Sep	3		Climate History	How Science is Done		30-51
11-Sep	4		Evidence for Anthro. CC	Uncertainty/Consensus		30-51
18-Sep	5		CC and the Weather	Research and Big Data	Intro. Semester Project (2nd hr)	52-67 & 112-115 & 132-135
25-Sep	6		CC Projections	Models	Sem. Proj. Initial Proposals	68-117
2-Oct	7	Problems and Solutions	Ecological Impacts of CC	Team Science	Midterm Exam – Oct. 3 (7:20 pm)	124-131 & 188-189
9-Oct	8		Population/Consumption	Ethics /Sustainability	Field trip – Oct 7	136-149 & 206-207
16-Oct	9		Agriculture/ Land Use	Communicating Science	Sem. Project Hypoth./Source	150-163 & 184-187
23-Oct	10		Energy	From Lab to the Real		164-177
30-Oct	11		Built Environment	Effecting Change	Sem Proj. Quant. Method Pres.	178-199
6-Nov	12	CC Policy	Environmental Policy	Science in Action		200-213
13-Nov	13		Sea Level Rise	Science in the Public Realm		36-37 & 110-111 & 122-123 & 158-159
20-Nov	x		- No Class – Thanksgiving Week -			
27-Nov	14		- Semester Project Presentations During Class -			
4-Dec	15		- Semester Project Paper & Individual Assessment Due Dec 9 -			