*NMSU Climate Change Strategies for a Changing World*

ES 451/AGRO 598/AGRO 698 Elective for undergraduate & graduate students

Spring 2020: Tuesdays and Thursdays 1:30-2:35pm - Gerald Thomas 360

Professor & TA

Professor - Dr. David DuBois, New Mexico State Climatologist: 575-646-2974, dwdubois@nmsu.edu

Office Hours: Immediately after class or by appointment in Skeen N334

Teacher’s Assistant (TA), Emily Creegan: ecreegan@nmsu.edu: NMSU PhD candidate – background in composting/soil carbon sequestration/water conservation

Course Description

*Climate Change Strategies for a Changing World* is intended to provide a broad base scientific background and introduction to climate change definitions and parameters, including past affects and future predictions. This course is multifaceted and highlights climate change impacts on the following disciplines and sectors: sciences, engineering, health, business, international studies, media, language arts and communication, and more. The foundation of the course is tailored to each discipline and development of an application-based model in local and global climate change mitigation and resiliency strategies via a semester project (with potential future implications/extensions). In addition to the course being taught by our State Climatologist, several established and influential project mentors and guest lecturers will assist in student project mentorship and course supplemental learning objectives.

Tentative Grading Rubric

1) Course group project/presentation: 40% (20% group project; 10% group presentation; 10% individual group project assessment **individual contributions and group collaboration is key to project success!**)

* For each project the following **metrics** of **project success** must be accounted for:

-Identify **mitigation or resiliency project strategy (or both)**

-**Impact analysis:** definition of impact for the given project and if the project is not implemented (null) – impacts on social, environmental, governance, and cultural (and international sensitivities) factors

**-Cost/benefit analysis** (research or rough estimate needed – could be an emerging idea you will be contributing to!)

-**Overall feasibility and risk assessment (application factors)**

**-Longevity factors** (project complexity factors, regulations and codes – international, regional, university vs. City etc., technology & cost factors, utilizing locally available resources etc.)

* Final group presentation format (to be discussed during the course): the final group presentation may be videotaped and shared publicly – facilitating real world networking, communication and education outreach!
* Completion of individual group project assessments (you will assess each group members level of participation and contributions to the project)

2) Course individual paper: 20%

* A minimum of (6) double spaced pages, can include graphs and other source citations, based on the course project
* **Graduate students: a minimum of (9) double spaced pages formatted as a journal manuscript, based on the course project**

3) (4) online quizzes based on past readings, class discussions and guest lecturer presentations: a total of 20% of your grade; each quiz is worth 5% of your grade

4) Class participation (including attendance, ***course individual habit challenge***, online social media posts/roundtable group check-ins and learning projects/guest lecturers' participation and in-class discussion on news articles): 20%

5) **Graduate students** must attend and provide a brief write-up (one page, double spaced) on at least one climate change related event

6) Extra credit is available for attending climate change related events/workshops/presentations etc. (Dr. DuBois needs to clear it first; **graduate students must attend at least two**).

Course Texts/Readings

* **PRIMARY TEXT**: Henson, R. (2018) *The Thinking Person's Guide to Climate Change.* Boston, Massachusetts: American Meteorological Society. 2nd Edition.
* *Cooler, Smarter: Practical Steps for Low Carbon Living* (available on CANVAS)
* Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II 10 Agriculture and Rural Communities: <https://nca2018.globalchange.gov/downloads/NCA4_Ch10_Agriculture_ExecSum.pdf>

Late assignments will automatically receive a 50% loss of points. The assignments will not be accepted later than 2 days after the due date and will result in a zero for that assignment. If you can’t get it done on time, then please turn in a partially completed assignment for partial credit. If you are sick and can’t come to class, you may email the homework to me no later than the end of class when the homework was due.

Missed quizzes will be assigned a zero.

Grading criteria: Letter grades will be assigned according to the following:

90-100% = A; 80-89% = B; 70-79% =C; 60-69% = D; <60% = F

Potential Projects

1. 100% renewable: Environment NM
2. Climate resilience “At home/apartment/in your space”:

-Ruth Florez will present images of her house retrofits

-Used clothing share/re-use project (and full cycle international assessment)

-Solar oven

**-**Carbon footprint analysis, i.e. grocery stores, etc.; mitigation component - tree planting

-Lighting retrofitting

-CoCoRaHS (Community Collaborative Rain, Hail and Snow Network)

**-**Students correlate cost savings with fossil fuels, water savings etc. and come up with an initial budget

3) NMSU sustainability internship/Earth Day coordination with campus Facilities Sustainability Manager, Allison Jenks or Bike-Ability project: how do we make our campus more bike friendly

1. Native/plot at organic farm/educational signage on water conservation, native species etc. students assess what has already been done on other campuses and related projects with Angie Swanson, Skeen Compost Club
2. Journalism: students write about projects and this class, local radio, published through the Green Chamber etc. KRWG or KTAL with Michael Hernandez

**ALL:**

* PES Open House presentations (DATES) (extra credit)
* Earth day (extra credit)
* NM Success: evening lectures (extra credit)
* Focus more on metrics of analysis on fossil fuels and water savings, etc.
* Create a budget (if any) for your project
* Dr. D will explain project budgets/the reimbursement procedure and this will be posted on canvas

**NMSU SPRING SEMESTER 2020: January 22 – May 19, 2020 (spring break: March 23-27; finals week: May 11-15)**

**WEEK 1 (January 23): Course introduction**

Thursday:

* Syllabus overview, project introductions & group activity (name tags, major, why are you in the course, and extreme events sharing)
* Discussion on professional & safe interactions
* Course questionnaire (non-graded, class participation credit)

Assignment: Research and print out a relevant (within the past 6 months) news article on climate change

**WEEK 2 (January 28 and 30): How do we know climate change is real?**

Tuesday: The science behind the facts

Assignment: News Article 1 due before class this Thursday (assignment due on CANVAS and in class discussion)

Thursday: News article, project parameters, and proposal discussion, CANVAS interface, project management assignment plan

Assignment: Create your CANVAS interface group & a group name

**WEEK 3 (February 4 and 6): Climate change mitigation and resiliency**

Tuesday: Local and global initiatives; review of what is due for the Feb. 13 group proposal presentations; Emily will present on mitigation and resiliency

Assignment: Coordinate group schedules and meet with your group to begin identifying past example projects and your group project management assignment and proposal (due Feb. 13)

Thursday: Guest lecturer Allison Jenks (NMSU Sustainability Manager) on her position and local and campus sustainability projects (and ideas for current ones!)

Assignment: Chapter 1 reading on Cooler, Smarter: Practical Steps for Low Carbon Living

**WEEK 4 (February 11 and 13): Projects!**

Tuesday: In class project group time and mentoring

Assignment: Project management assignment/proposal (due this Thursday, Feb. 13)

Thursday: Project management assignment due and GROUP PROPOSAL PRESENTATIONS & PIZZA – INPUT TIME!

Assignment: reading

**WEEK 5 (February 18 and 20): Human health and international factors**

Tuesday: Local and global island and coastal, water, heat effects etc. Lecture

**Assignment**: **online quiz re. class readings, discussions, and guest lecturer discussions; submit by midnight tonight**

Thursday: International factors and time to work on projects in class (mentor time)

Assignment: reading

**WEEK 6 (February 25 and 27): Health, agriculture, and water**

Tuesday: Agriculture, Water and Climate Change local lecture Dr. Brian Hurd GUEST LECTURER

Assignment: work on group project

Thursday: Potential guest lecturer, Catie Steele

Assignment: reading

**WEEK 7 (March 3 and 5): Food production/Eating Habits, transportation, and air quality**

Tuesday: Food production/eating habit/climate change lecturer Dr. Kulbhushan Grover Guest Lecturer

Assignment: work on group project

Thursday: Emily presents on organic material, composting, soil carbon sequestration & water conservation

Assignment: work on group project and bring in a relevant news article to discuss next Thursday

**WEEK 8 (March 10 and 12): The economy and climate change policy & politics**

Tuesday: Dissecting the political dichotomies: the economy, policy and climate change lecture

Assignment: work on group project

Thursday: Carbon footprint online analysis tool and news article discussion; Emily will present on her business model

Assignment: reading

**WEEK 9 (March 17 and 19): Waste, recycling and climate change**

Tuesday: Waste, recycling and climate change lecture

Assignment: work on group project

Thursday: Las Cruces City Recycling Coordinator guest lecturer Miguel Fernandez

**Assignment: Online quiz re. class readings and discussions submit by midnight tonight**

**SPRING BREAK**

**WEEK 10 (March 31 and April 2): Energy and climate change**

Tuesday: Full life cycle and energy and climate change lecture by Emily

Assignment: reading

Thursday: EnvironmentNM, Solar Initiative and legislation potential guest lecturer

Assignment: reading

**WEEK 11 (April 7 and 9): Energy continued and media and climate change**

Tuesday: Guest speaker: Matthew Meyers E.ON Energy talking about wind energy.

Assignment: reading on geospatial analysis

Thursday: Media and climate change; Facebook, Twitter & YouTube - how to decipher and share the truth

Assignment: research and post a summary of a climate change related peer-reviewed article findings on social media

**WEEK 12 (April 14 and 16): International issues and climate change**

Tuesday: International issues and climate change lecture and career development in international work and collaborations

Assignment: work on your group project and individual paper

Thursday: Movie on international issues and climate change and discussion on potential student research on grant funding availability and real-world collaborations/group project extensions on climate change mitigation and resiliency strategies

Assignment: work on your individual paper

**WEEK 13 (April 21 and 23): Climate change communication: education and art**

Tuesday: How to incorporate scientific facts into education and art

Assignment: work on your group project

Thursday: Potential journalist guest lecturer

**Assignment: online quiz re. class readings and discussions submit by midnight tonight**

**WEEK 14 (April 28 and 30): Engineering and climate change & project work week**

Tuesday: Lecture on engineering and geoengineering climate change principles and strategies

Assignment: reading

Thursday: Work in your groups in class to finalize your presentations

Assignment: work on project presentations and your final individual paper

**WEEK 15 (May 5 and 7): Student Project Presentations/Seminar Forum\***

Tuesday: Student group project presentations

Thursday: Student group project presentations

\* Seminar invitation to all departments and presentation filming

**WEEK 16 (May 11-15): Finals week**

**Tuesday:** in-class evaluation and **final (non-cumulative) online quiz re. class readings, guest lecturers, and discussions; submit by midnight tonight**

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Code of Conduct: Please see the Student Code of Conduct in The Student Handbook: <http://deanofstudents.nmsu.edu/student-handbook/1-student-code-of-conduct/> Pay particular attention to “III.B. Academic Misconduct.” Academic misconduct will not be tolerated and will result in severe penalties including an F in the class.

Email Communication: Please use your NMSU email for communicating with the instructor. Communication regarding any university matters should be to and from NMSU e-mail only. This is to protect confidentiality.

Students with Disabilities: If you have, or believe you have, a disability and would benefit from accommodations, you may wish to self-identify. You can do so by providing documentation to the Services for Students with Disabilities (SSD) Office located at Garcia Annex (phone: voice 646-6840, TTY 646-1918). If you are already registered with the SSD office and need accommodations please provide your “Accommodation Memo” from the SSD within the first two weeks of class. If you have a condition that may affect your ability to exit safely from the premises in an emergency or that may cause an emergency during class, you are encouraged to discuss this in confidence with the instructor and/or the Coordinator for SSD. All information will be held in strict confidence.

Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act Amendments Act (ADAAA) covers issues relating to disability and accommodations. If a student has questions or needs an accommodation in the classroom (all medical information is treated confidentially), contact:

Trudy Luken, Director

Student Accessibility Services (SAS) - Corbett Center, Rm. 244

Phone: (575) 646-6840 E-mail: sas@nmsu.edu

Website: <http://sas.nmsu.edu/>

University policy on discrimination and sexual harassment: NMSU policy prohibits discrimination on the basis of age, ancestry, color, disability, gender identity, genetic information, national origin, race, religion, retaliation, serious medical condition, sex, sexual orientation, spousal affiliation and protected veterans status.

Furthermore, Title IX prohibits sex discrimination to include sexual misconduct: sexual violence (sexual assault, rape), sexual harassment and retaliation.

For more information on discrimination issues, Title IX, Campus SaVE Act, NMSU Policy Chapter 3.25, NMSU's complaint process, or to file a complaint contact:

Gerard Nevarez, Title IX Coordinator

Agustin Diaz, Title IX Deputy Coordinator

Office of Institutional Equity (OIE) - O'Loughlin House, 1130 University Avenue

Phone: (575) 646-3635 E-mail: equity@nmsu.edu

Website: <http://eeo.nmsu.edu/>

Other NMSU Resources:

NMSU Police Department: (575) 646-3311 www.nmsupolice.com

NMSU Police Victim Services: (575) 646-3424

NMSU Counseling Center: (575) 646-2731

NMSU Dean of Students: (575) 646-1722

For Any On-campus Emergencies: 911