CHEM 360
Scaling Sustainability: Global Impacts on Environment and Energy
Spring 2020 Syllabus

Instructor: Nathanael M. Kidwell
Office: ISC 1287, (757)221-1701
Email: nmkidwell@wm.edu
    (include CHEM 360 in subject line)
Office Hours: M 11:30-12:30pm; or by
    appointment (Please email times
    when you are available to meet)

Course Information
Class Meetings: ISC 1111
Class Location: T/R 12:30-1:50pm

Website: Course information will be
    posted on Blackboard

Course Description and Goals

The seemingly small decisions and actions we make on a daily basis not only impact our immediate surroundings but have long-term consequences that shape global perspectives and large-scale events. Small-scale laboratory findings have the potential to revolutionize societies, and grass-roots movements could possibly enact global change. With the focus on sustainability, this course will explore global and cultural viewpoints on environmental and energy-related issues. In particular, we will develop a molecular-scale understanding of regional atmospheric composition in different locations and their collective influence on global warming. Furthermore, we will study global perspectives on day-to-day energy utilization and discuss if renewable energy resources are a viable and scalable option for different societies. Students will develop critical thinking, analytical writing, and presentation skills by evaluating course-relevant scientific literature and media sources. In a broader context, students will improve their ability to better assess the risks and benefits of socially-relevant issues and to make informed decisions about technology-based matters.

Spring 2020 COLL 300 Theme: Scale

The notion of scale is intrinsic to how we understand the world and our place in it. The scale of interactions between people varies across space, evolves over time, and profoundly influences how we relate to each other, to cultures, and to our environment. How do changes in the breadth and speed of global communication influence languages and cultures? How do scientists use small-scale laboratory experiments to solve large-scale global problems? How do small grassroots movements evolve into major forces for cultural change around the world? From the local to the global, the microscopic to the macroscopic, and the personal to the collective, Scale informs our experience and our efforts to effect change.

Required Texts

Chemistry in Context: Applying Chemistry to Society, 8th Edition by Catherine H. Middlecamp; McGraw-Hill Education, 2015. ISBN: 007352297X.

Environmental Success Stories: Solving Major Ecological Problems and Confronting Climate Change by Frank M. Dunnivant; Columbia University Press, 2017. ISBN: 0231179197.

The Great Derangement: Climate Change and the Unthinkable by Amitav Ghosh; University of Chicago Press, 2017. ISBN: 0226526812.

Alternative Energy: Political, Economic, and Social Feasibility (2nd Edition) by Christopher A. Simon; Rowman & Littlefield Publishers, Inc., 2019. ISBN: 1538116367.

Oil on the Brain: Petroleum's Long, Strange Trip to Your Tank by Lisa Margonelli; Broadway Books, 2008. ISBN: 0767916972.

COLL 300 Visitor Seminars

Students are required to attend the three COLL 300 visitor seminars scheduled during the semester. The COLL 300 visitors include Prof. Ana L. Moore, Andrew Farnsworth, and Daniel Hernandez-Salazar who will each describe the context of Scale within their particular disciplines. Following the COLL 300 visitor's seminar, students will write a reflection paper in response to a prompt that will be posted right after the talk. Reflection papers are required for two of the three visitors, but you must attend all three seminars.

COLL 300 Academic Festival

All courses in the campus COLL 300 end the semester with an Academic Festival, where students prepare and host a presentation of some aspect of their work. This is an excellent opportunity to interact with students to see how different courses have approached and engaged this semester's theme of Scale. Required attendance.

For the Academic Festival project in this course, student teams consisting of 3 students (one group will have 4 students) will develop an interactive Story Map with ArcGIS Online to tell a story of an environmental or energy-related topic in another country. Each student within the team will drill deeper into some aspect (economics, policy, science, history, sociology, etc.) that you find particularly interesting or important, and this aspect will also form the basis of each student's term paper. **We will have an in-class Story Map workshop scheduled on Feb. 6 with a representative from the campus Center for Geospatial Analysis to learn best practices when developing Story Maps.** More information will be given about the Story Map projects during the semester.

Student Course Responsibilities and Course Policies

Attendance: A good class discussion depends on the participation of all students; therefore your presence in class is essential. Two unexcused absences (or four late arrivals) will lower your **final** grade by one-third letter grade (e.g. A- to B+). Excused absences include those arranged with me beforehand. You should have completed all assigned reading before class and bring relevant texts to class.

Classroom Behavior: Please remain civil during discussions to promote the open exchange of ideas and foster a culture of open dialogue. Please bear in mind that all students are entitled to their own opinion. You are expected to listen attentively to each person speaking.

Breaking News: New information relevant to this course appears every day. Relatively reliable sources for this information include:
- National newspapers (e.g., *The New York Times*, *The Washington Post*, *etc.*)
- National news magazines (e.g., *Time*, *Newsweek*, *U.S. News and World Report*)
- Scientific news magazines(e.g., *Science News*, *Scientific American, Discovery*)

The first part of each class session will be spent discussing news items *relevant to the class*. Contributions of breaking news items will be used as a partial basis for the class contribution grade. Teams will be the assigned "News Anchors" at each class meeting. These students will provide an overview of the most significant or interesting class-related news stories since our last class and coordinate discussion.

Preparation for class discussions: Unlike most chemistry classes, this will be a class based on informal discussion of the reading assignments. For this reason, it is essential that students come to class prepared to discuss the reading. Students will be expected to bring a **printed** list of *discussion points* (NOT questions) from the reading assignments to be used during class. These lists will be collected and used as a partial basis for the class participation grade.

Team Presentation: Each student team will be responsible for presenting a 15-20 minute PowerPoint presentation on the team's project to the rest of the class. A coherent story should be told on an environmental or energy-related topic in another country, where each students describes a particular aspect they chose (economics, policy, science, history, sociology, etc.). **We will have an in-class Swem Library workshop on Jan. 30 to refresh skills on researching topics, databases, etc., and to fine tune the specific ideas for each team.**

> The presenting student team will be responsible for giving a general overview of the significance of the environmental or energy-related topic chosen; for discussing background material and answering questions; and for directing class discussion. All other students must be prepared to ask questions at the end of the presentation, which will count toward the class participation grade.

Final Presentation: Prior to the Academic Festival, student teams will give a 20-30 minute presentation, showcasing the Story Map they constructed on an environmental or energy-related topic in another country. Effective communication, creativity, and a compelling story will be rewarded. More information concerning formats and grading rubrics will be provided as the time approaches. Each team's final presentation grades will be an equal combination of grades assigned by your team peers, that assess your individual contributions to the team's effort, and grades assigned by the instructor on the overall quality of the presentation.

Writing Assignments: Writing assignments will be distributed as follows:

Reflection papers: These assignments are two pages (max) in length. Students will write a responsive paper to a prompt that will be posted following the COLL 300 visitor seminars. They will be graded for content and style on a high pass/pass/low pass/fail basis. Reflection papers are required only for two of the three visitors, but you must attend all three seminars. You may submit three papers, and I will use the top two grades.

Term paper: This assignment is eight to ten pages (max., not including references). Every student within each team will write a final term paper based on the particular aspect they chose as their focus for the Story Map project. Topics must be approved in advance by the instructor. A schedule for term paper research and development is given below. Suggestions to guide your choice of a topic can be found at the end of this syllabus.

Peer feedback: Each student must have one other student from another team read and comment upon a draft of their term paper; each student must read and provide one page (250 words) of comments for one other student's term paper draft in return. Feedback should take the form of a letter to the author addressing the *content* of the paper. Your comments may argue with the writer, add to what they are saying, point out weaknesses in the argument, etc. Written copies of the feedback will count towards the class contribution grade. Additional comments of an editorial nature (need transition, spell check, sentence fragment, etc.) should be noted on the manuscript. Each student should turn in the peer feedback they received with their term paper. This peer feedback will count toward the class participation grade.

Manuscript Preparation: All papers should be written individually, computer-generated, double-spaced, with left justified one-inch margins (**NOTE**: The default in Microsoft Word is 1.25" unless you change it!) and using 12-point Times New Roman font. Citations for the term paper should be in APA format, and should also be provided as a bibliography at the end of your document (this portion of the paper will not count towards the page limit). Direct quotes from sources should not be used. Extensive paraphrasing of sources and failure to cite sources are unacceptable and possible causes for Honor Council deliberation of plagiarism. Papers which do not fulfill the stated requirements of the assignment will not receive a grade higher

than a C. Papers should always be submitted with the **pages numbered**. Proofread carefully before submitting your work! Place your name, the date, and the title of the paper at the top of the first page.

Manuscript/Assignment Submission Procedures:

- The reflection papers and the term paper should be submitted to me as computer-generated **hardcopy printouts**. A PDF or Word version will also be uploaded to Blackboard.
- The discussion points for each day's reading, and the peer feedback of term papers should be submitted to me as computer-generated **hardcopy printouts** formatted as outlined above.

Grading Policies

Grading: Your grade will be calculated as follows:

- Story Map/term paper (and associated assignments): 45%
  - Feb. 4: Last day to submit ideas for the Story Map project and term papers
  - Mar. 24: One paragraph abstract, outline & preliminary bibliography (at least 5 sources)
  - Final Presentation given on assigned date
  - Apr. 23: Polished term paper draft to be given to peer reviewer.
  - Apr. 30: Peer feedback on term paper drafts due
  - May 12: Final version of the term paper due by 5:00 pm in ISC 1039 and uploaded to Blackboard. A link to your team's Story Map should be included with your term paper.
- Team Presentation: 15%
- Class contributions: 20%
- Reflection papers from COLL 300 visitors (2 @ 10% each): 20%

There is no final exam, but a final term paper and the Story Map are due by the final exam date.

Deadlines: Assignments must be turned in on time. The following policies apply:

1) Daily lists of discussion points will be turned in at the *end of the class period*. Late assignments will receive no credit. Assignments must be completed ***before*** you come to class.

2) All other assignments are due on the designated day as a hardcopy by 5:00 pm in the chemistry main office (ISC 1039) and electronically as PDF files on Blackboard by 11:59 pm. These assignments are subject to the following rule: for every day they are late, they will be worth 25% less. Note that weekend days and non-class days do count. This policy will only be waived in extreme circumstances.

Class Climate, Culture and the Honor System

This is a COLL 300 course, designed to give students a chance to explore an academic area of interest through the lens of a global perspective. Most class periods will be filled by discussion of the assigned reading, with frequent opportunities to write and showcase their work. In order for discussions to be productive, all students need to feel comfortable participating. We will create and maintain an atmosphere of mutual respect in which everyone's ideas can be heard.

Scientists always seek feedback from their colleagues when preparing papers and oral presentations. I encourage students to collaborate in this way as well. Note that feedback includes comments and critiques; it does NOT include doing the work for someone else.

Since William & Mary has an Honor System, I feel comfortable encouraging collaboration between students. Please see me if you have any questions about how the Honor System applies to your responsibilities in this course.

Relevant Resources to this Course

I strongly encourage you to use these resources. Every professional needs to be able to write and to speak in public. Practice over time with good feedback is the best way to develop these skills.

> A. The Writing Resources Center:
> Located on the main floor of Swem Library, the Writing Resources Center serves students, faculty, and staff. Writing consultants (students trained by the Writing Resources Center staff) will give individual assistance with writing assignments at any stage of the writing process. Expect to work: they will not do the writing for you, but they can give you feedback that will improve your writing skills and result in a better final product. Consultations are free, but must be scheduled in advance.
>
> B. The Purdue Online Writing Lab – OWL (https://owl.english.purdue.edu/):
> This site provides some exercises and general rules for word use, spelling of similar sounding words, etc.
>
> C. Oral Communication Studios:
> The Oral Communications Studios, located with Writing Resources, are staffed by oral communications consultants (students trained by the staff of the Oral Communications Studio) who can critique and advise students who are preparing oral presentations.
>
> D. Center for Geospatial Analysis:
> The Center for Geospatial Analysis is located on the second floor of Swem Library, and is staffed with professionals who may be used as a resource for your team as you are developing the Story Map project.

Choosing a Topic for your Story Map and Term Paper

Choosing an appropriate topic takes time. Plan to:

1) Spend time brainstorming; use news sources and your textbooks to come up with a short list of topics that interest you. A Google search can help you find a wide selection of information sources, some of which will be reliable: use the results with care! Brainstorm with your teammates and use the Swem Library workshop to your advantage.

2) Discuss possible topics with the instructor, either by e-mail, during an appointment, or before/after class.

3) Do preliminary literature searches using the databases available through the Swem home page to see if the topics you have found can be covered effectively in your Story Map presentation and term paper. To search the scientific literature for information on your possible topic, be sure to use the Summon Discovery search engine in Swem's web research pages.

***Talk to the reference librarians in Swem, if you need help finding information on your topic.

A good Story Map and term paper topic will have the following characteristics:

1) The topic should be current: Be sure that most of your citations were published in the last five years; papers from 2015 – 2020 should **dominate** your reference list for maximum credit!

2) The topic should be focused: be sure that you can discuss details rather than generalizations.

3) The topic should be understandable. Be sure that the references you find when you do your initial search for key sources are reasonably easy for you to understand.

4) The topic should be interesting to you. By the end of the semester, you will have spent a great deal of time with your topic. If it started out seeming boring but appropriate, you will hate it by the time the paper is finished.

Course Calendar (tentative)

Date	Readings	Assignments	News Anchors
Jan. 23	Course introduction - Review of syllabus, policies, etc.		
Jan. 28	Middlecamp Ch. 0.1-0.7; Ghosh 1.1-1.4	In-class: Form teams and brainstorm preliminary team project ideas	
Jan. 30	**Swem Library Workshop**		
Feb. 4	Dunnivant Ch. 1; Middlecamp Ch. 5.3-5.4, 5.10; Ghosh Ch. 1.5-1.8	Team project idea due; In-class: Make story boards	
Feb. 6	**Story Map Workshop**		
Feb. 11	Dunnivant Ch. 2; Middlecamp Ch. 5.11-5.12; Ghosh Ch. 1.9-1.12		Team #4
Feb. 13	Dunnivant Ch. 3; Middlecamp Ch. 4.1,4.3, 4.4; Ghosh Ch. 1.13-1.18		Team #5
Feb. 18	Dunnivant Ch. 4; Ghosh Ch. 2.1-2.5	Team Presentation #1	Team #6
Feb. 20	Dunnivant Ch. 5; Middlecamp Ch. 6.11-6.13; Ghosh Ch. 2.6-2.9	Team Presentation #2	Team #7
Feb. 25	Dunnivant Ch. 6; Middlecamp Ch. 1.3-1.5, 1.10-1.13, 2.1, 2.6-2.11	Team Presentation #3	Team #8
Feb. 27	Dunnivant Ch. 7; Ghosh Ch. 3.1-3.5	Team Presentation #4	Team #1
Mar. 3	Dunnivant Ch. 8-9; Middlecamp Ch. 3.1, 3.2, 3.5, 3.8-3.11; Ghosh Ch. 3.6-3.9	Team Presentation #5	Team #2
Mar. 5	Simon Ch. 1; Middlecamp Ch. 4.7-4.9, 4.11; Margonelli Ch. 1	Team Presentation #6	Team #3
	Spring Break		
Mar. 17	Simon Ch. 2; Margonelli Ch. 2	Team Presentation #7	Team #4
Mar. 19	Simon Ch. 3; Middlecamp Ch. 7.1, 7.3, 7.5, 7.6, 7.9-7.11; Margonelli Ch. 3	Team Presentation #8	Team #5

Date	Readings	Assignments	News Anchors
		Story Map Project	
Mar. 24		Outline, Abstract, & Preliminary Bibliography (at least 5 sources) for term paper	
Mar. 25	**COLL 3OO Visitor: Daniel Hernandez-Salazar from 5-6:30 pm - Sadler Center (Reflection Paper due Mar. 29 by 11:59pm)**		
Mar. 26		**Story Map Project**	
Mar. 31	Simon Ch. 4; Middlecamp Ch. 8.7, 8.8; Margonelli Ch. 4		Team #6
Apr. 1	****COLL 3OO Visitor: Dr. Andrew Farnsworth from 5-6:30 pm - Sadler Center (Reflection Paper due Apr. 5 by 11:59pm)**		
Apr. 2	Simon Ch. 5; Margonelli Ch. 5	Final Presentation #1	Team #7
Apr. 7	Simon Ch. 6; Margonelli Ch. 6	Final Presentation #2	Team #8
Apr. 9	Simon Ch. 7; Margonelli Ch. 7	Final Presentation #3	Team #1
Apr. 14	Simon Ch. 8; Margonelli Ch. 8	Final Presentation #4	Team #2
Apr. 15	**COLL 3OO Visitor: Prof. Ana Moore from 5-6:30 pm (Reflection Paper due Apr. 19 by 11:59pm)**		
Apr. 16	Simon Ch. 9; Margonelli Ch. 9	Final Presentation #5	Team #3
Apr. 21	Margonelli Ch. 10	Final Presentation #6	
Apr. 22	****COLL 3OO Visitor: Dr. Andrew Farnsworth from 5-6:30 pm - Sadler Center (Reflection Paper due Apr. 26 by 11:59pm)**		
Apr. 23	Margonelli Ch. 11	Polished draft of term paper due today Final Presentation #7	
Apr. 28	Decoding the Weather Machine (PBS Documentary)	Final Presentation #8	
Apr. 29	**Academic Festival from 5-6:30 pm in the Sadler Center**		
Apr. 30	Reflections on the Course	Peer feedback on term paper due	
	Final Exam Period Begins		
May 12		Final version of term paper due by 11:59 pm as a PDF file uploaded to BB.	

** Dr. Andrew Farnsworth will either visit Apr. 1 or Apr. 22