

# AS.270.3XX Communicating Climate Science

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Fall Term 2020

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Office Hours: open door policy or by appointment

Class meetings: TTh in Olin Hall

Course Description: This course is a study of techniques used to effectively communicate scientific knowledge with a focus on climate science. This will be done with three overarching topics: reading and comprehending scientific papers, critically interpreting science news from the media, and communicate complex climate science to a general audience. Although this course does not have any explicit prerequisites, it is oriented towards science and engineering majors in its level of difficulty.

Required Texts: Students are expected to obtain a copy of the books, but the articles will be provided by the instructor

- *Houston, We Have a Narrative* by Randy Olson, 2015 (purchase new for \$16.43)
- *Lies, Damned Lies, and Science* by Sherry Seethaler, 2009 (purchase new for \$24.99)
- Select scientific journal articles (see course outline)

Learning Objectives: By completion of this course, the student will demonstrate the ability to

1. Comprehend technical content of scientific journal articles
2. Critically analyze scientific studies featured in news media
3. Evaluate media's portrayal of major scientific conclusions
4. Critique effectiveness of the scientific community to present conclusions
5. Effectively communicate a complex climate topic to a general audience

## Assessments:

*Student-led Discussions.* Each week the class will participate in discussions of assigned scientific journal articles. Students will take turns leading these discussions, but their participation will be assessed continually.

*Critical Thinking Exercise.* In the sixth week of the course, students will complete an exercise in class that applies critical thinking to scientific studies highlighted in the news. More details on this exercise will be provided at a later date.

*Media Sources Paper.* Students will find a news report of a scientific study and perform research on the sources behind that report. In a short 1-2 page paper due in the fifth week, students will assess the validity of the conclusions presented in the report by citing those primary sources. A rubric for

this paper will be provided.

*Detailed Critique.* Students will critique and compare the effectiveness of scientists' communication to the public, detailing what techniques were effective and how it might have been improved. This will be written in a short 1-2 page paper due in the eighth week of the course, A rubric for this paper will be provided.

*Culminating Communications Project (CCP).* The major project, designed to utilize tools discussed through the semester, will be for students in assigned groups of 2-3 to choose a complex climate topic and develop a media of their choice (presentation, video, podcast, etc) to explain that topic and its implications to the general public. This project will be the focus of the last third of the course and will have a total of three progress deadlines, a rubric for each deadline will be provided.

Grading Policy: This course will implement *specifications grading*, a form of grading that is competency-based and evaluates students given their accomplishment of the specified learning objectives listed above. The standard for achieving each learning objective is high, but expectations to attain each achievement will be explicitly stated. The details of this specifications grading are:

*All assignments are graded as either satisfactory or unsatisfactory.* Rubrics will be provided to ensure clear expectations, specifying what is required to receive a satisfactory grade for each assignment. For discussion-based lessons, satisfactory grades are awarded to those who demonstrate enthusiastic participation and regular attendance.

*Students are given three tokens that provide opportunities to revise an assignment that was unsatisfactory, or turn in an assignment late without penalty.* The tokens may be applied to any of the assignments excluding the student-led discussions and the final deadline for the Culminating Communications Project in which groups present their work.

	A	B	C
<b>Assignments (# total):</b> <i>Learning Objective</i>	<i>Outcomes Required for Grade Bundle</i>		
Student-led discussions (14) <i>Objective 1</i>	Satisfactory: as leader (1), as participant (10), no more than 3 absences	Satisfactory: as leader (1), as participant (9), no more than 4 absences	Satisfactory: as leader (1), as participant (8), no more than 5 absences
Critical thinking exercise (1) <i>Objective 3</i>	Satisfactory	Two out of three objectives satisfactory	One out of three objectives satisfactory
Media Sources Paper (1) <i>Objective 4</i>	Satisfactory		
Detailed Critique (1) <i>Objective 5</i>	Satisfactory		
Communications Project (1) <i>Objective 6</i>	Satisfies Standards	Satisfies Standards	Approaches Standards

*Letter grades at the end of the semester are set by the number of assignments a student achieves at the satisfactory level, according to the grade bundles in the table above.*

*If a student's work falls between two grade bundles, plus or minus grades will be granted as follows:*

- A+ All requirements for the A bundle *plus* the communications project was exceptional
- A- All requirements for the A bundle *except* attendance and/or participation in discussions is slightly lagging
- B+ All requirements for the B bundle *plus* exceptional attendance/participation in discussions
- B- All requirements for the B bundle *except* communications project was approaching standards
- C+ All requirements for the C bundle *plus* exceptional attendance/participation in discussions OR two of objectives 3-5 are satisfactory
- C- All requirements for the C bundle *except* attendance and/or participation in discussions is slightly lagging

As achievement of learning objectives are assessed on a satisfactory basis, a student who fails to meet the qualifications of a C grade will fail the course. Assigning grades of D or D+ will only be considered in extenuating circumstances.

Attendance: It is expected that students will be present at all class sessions as it is crucial to their comprehension of topics and overall success in the course. If for any reason a student is unable to be present, they must notify the instructor of their excused absence in advance of that class and are still responsible for any content they may have missed.

Academic Integrity: It is expected that all students at Johns Hopkins University uphold academic and personal integrity above reproach. Ethical violations, including cheating, plagiarism, lying, dishonesty, falsification, alteration, will not be tolerated in this course. Collaboration among students is encouraged, but all work submitted must be completed solely by the individual, excluding projects that are group based.

Disabilities: Students with disabilities may be granted appropriate accommodations after registering with the Student Disability Services. If you think you may require accommodations, please contact the Student Disability Services at (410) 516-4720, studentdisabilityservices@jhu.edu, or in-person at Shaffer Hall 103. More information is available at <https://studentaffairs.jhu.edu/disabilities/>.

Course Outline:

	<b>Week's Topic</b>	<b>Journal Article</b>	<b>Background Reading</b>	<b>Assessment</b>
31-Aug-2020	Disagreement in Science	Knutson et al. [2010] Emanuel [2013] Merlis et al. [2013]	Seethaler [2009]: Chap. 1	Discussion
7-Sept-2020	Evaluating Interests	Keeling [1970] additional news op-eds	Seethaler [2009]: Chap. 2	Discussion
14-Sept-2020	Seeking Validity	Phillips [1956]	Seethaler [2009]: Chap. 10	Discussion
21-Sept-2020	Science Narrative	Held and Soden [2006]	Olson [2015]: Intro, Thesis	Discussion
28-Sept-2020	Alternative Solutions	Budyko [1969]	Seethaler [2009]: Chap. 3-4	Discussion Due: media sources paper
5-Oct-2020	Evaluating Certainty	Held [2005]	Seethaler [2009]: Chap. 5	Discussion Critical thinking exercise
12-Oct-2020	Significance and Implications	Manabe and Wetherald [1967]	Seethaler [2009]: Chap. 6	Discussion
19-Oct-2020	Science Narrative	Trenberth and Caron [2001]	Olson [2015]: Antithesis	Discussion Due: detailed critique
26-Oct-2020	Filtering Noise	Wittenberg [2009]	Seethaler [2009]: Chap. 7	Discussion
2-Nov-2020	Science and Policy	IPCC Summary for Policy-Makers	Seethaler [2009]: Chap. 8	Discussion  CCP deadline 1: choose topic
9-Nov-2020	Logical Interpretation	Hansen et al. [1984]	Seethaler [2009]: Chap. 9	Discussion
16-Nov-2020	Science Narrative	Zwally et al. [2002]	Olson [2015]: Synthesis	Discussion CCP deadline 2: submit outline
23-Nov-2020		<i>Thanksgiving Break</i>		
30-Nov-2020	Science Narrative	Hansen et al. [2005]		Discussion
7-Dec-2020	Science Narrative	Mann et al. [1999]		Discussion CCP deadline 3: present

## References

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- C. D. Keeling. Is carbon dioxide from fossil fuel changing man’s environment? *Proceedings of the American Philosophical Society*, 114(1):10–17, 1970.
- T. R. Knutson, J. L. McBride, J. Chan, K. Emanuel, G. Holland, C. Landsea, I. Held, J. P. Kossin, A. Srivastava, and M. Sugi. Tropical cyclones and climate change. *Nature geoscience*, 3(3):157, 2010.
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- S. Seethaler. *Lies, damned lies, and science: How to sort through the noise around global warming, the latest health claims, and other scientific controversies*. FT Press, 2009.
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