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SUMA K4734.001

Practicum on Environmental Research Science-Based Solutions for Sustainability

Time: Wednesdays, 4:10 – 6:00pm

Location: 326 Uris Hall

Instructor Information

Alison Miller (she/her)

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Office Hours: By appointment

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Instructional Assistant

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Office Hours: By appointment

This is an inclusive class/classroom and we are committed to ensuring that you are treated with respect and dignity and where every individual has equitable opportunity to participate, contribute and succeed in the class and at Columbia. We encourage you to contact us at any time if you have any questions or concerns.

Response policy: Email is the preferred mode of communication for getting in touch with us. You should expect a response within 24-48 hours.

Modality: This course meets in person / on-campus. If you need to miss class (e.g. due to illness) you will be expected to review the course PPT material, which will be posted on Canvas after class, and be expected to contribute to the discussion board online. There will not be an option to join class virtually.

Course Description

The Practicum on Environmental Research is a broad survey of the applications of frontier academic research to the practice of sustainability management, sustainable development, and environmental policy. **We'll explore how research can help address real world problems**, to have a direct impact on intractable problems that practitioners are facing every day.

The Practicum on Environmental Research is a **dynamic forum featuring a series of lectures and discussions by faculty and scientists**, both within Columbia University and from other institutions. These lectures emphasize key concepts in earth and environmental sciences and the social sciences relevant to sustainability practice, including introductions to data sources, analytical methods, and decision tools. We will also discuss an emerging approach, **co-production of knowledge**, to develop solutions. Co-production involves bringing non-academic stakeholders into the research process, from the design and

implementation to the translation of results into action. These partners inform the types of questions and solutions being posed, ultimately enhancing academia's ability to have impact, and contributing to better, more effective, and more equitable outcomes.

This course emphasizes the importance of science and how it critically advances society's knowledge and our ability to improve our resilience in the face of environmental change. Along with case studies and background reading/material, the lectures will illustrate how research can be used to provide the basis for actions by governments, the private sector, international organizations, and advocacy groups needed to address sustainability challenges. Through these examples, students will explore different approaches to research and data and how they can be applied to policy and management solutions using evidence-based, analytic approaches.

Through the course assignments, students will practice forming reasoned arguments based on fact, data, and scientific evidence, then use that evidence to recommend specific policy and management decisions. In a political era where facts are being questioned regularly and scientific discourse is attacked, this class will demonstrate the ability of science to illuminate opportunities for meaningful solutions related to sustainability.

Most class sessions will comprise a guest lecture followed by class discussion. Students will be expected to complete assigned readings and materials in advance and engage in class discussion. We will also engage in structured in-class debates on topics explored in the lectures and conducted by assigned debate teams. The debates will allow students to engage in evidence-based verbal arguments against opposing viewpoints in a mock setting.

There are no prerequisites for this course and students are not expected to have in-depth exposure to any of the sustainability topics/science presented in the course.

The course is open to both graduate and undergraduate students. Undergraduate students with the Special Concentration in Sustainable Development are required to take a practicum and this course fulfills that requirement.

Course Objectives

By the end of this course, students will:

- understand the connections between science and its application toward problems that practitioners face in the real world;
- identify the use of quantitative data and qualitative factors in advancing sustainability initiatives/policies;
- identify the importance of external stakeholder involvement and knowledge in addressing sustainability challenges;
- critically evaluate and analyze readings, other sources of information, and lectures around topics of sustainability science;
- present analysis, supported by data, in different formats (oral presentations, short-form summaries, term paper);
- synthesize, apply, and communicate sustainability knowledge to address complex sustainability challenges.

Fall 2023 Course Calendar

<u>Sept. 6:</u>	<i>Intro to the Course</i>
<u>Sept. 13:</u>	<i>Co-Production of Knowledge: Working with the Indigenous Community of Kotzebue</i>, Ajit Subramaniam, Lamont Research Professor, Lamont-Doherty Earth Observatory, Columbia Climate School
<u>Sept. 20:</u>	<i>Climate Adaptation and Co-Production</i>, Kristina Douglass, Associate Professor, Columbia Climate School
<u>Sept 27:</u>	<i>Solving Climate Change - What Data Tell Us About How to Clean Up our Energy</i>, Melissa Lott, Senior Research Scholar, Center on Global Energy Policy, School of International and Public Affairs, Columbia University
<u>Oct. 4:</u>	<i>Sustainable Investing</i>, Lisa Sachs, Research Scholar and Director, Center on Sustainable Investment, Columbia Law School
<u>Oct. 11:</u>	<i>Reimagining Conservation Today: Decolonization, Indigenous Sovereignty, and Collaboration</i>, Paige West, The Claire Tow Professor Of Anthropology, Barnard College
<u>Oct. 18:</u>	<i>Global Climate Change and Human Health: From Science to Practice</i>, Cecilia Sorensen, Associate Professor, Department of Environmental Health Sciences, Mailman School of Public Health, Columbia University **Midterm Abstracts Due **
<u>Oct. 25:</u>	<i>Connecting Beauty Standards, Toxic Chemicals, and Our Health</i>, Lariah Edwards, Associate Research Scientist, Department of Environmental Health Sciences, Mailman School of Public Health, Columbia University
<u>Nov 1</u>	<i>Community-Based Conservation of Freshwater</i>, Sui Chian Phang, Freshwater Fisheries Scientist, The Nature Conservancy
<u>Nov. 8:</u>	Debates 1, 2, & 3
<u>Nov. 15:</u>	Debates 4, 5 & Reflection
<u>Nov. 22:</u>	** Thanksgiving Break; No Class **
<u>Nov 29:</u>	Peter Ellis, Global Director of Natural Climate Solutions Science, The Nature Conservancy
<u>Dec. 6:</u>	<i>Putting People at the Center of Climate-Resilient Food Systems</i>, Jessica Fanzo, Professor of Climate, Columbia Climate School ** Final Papers Due **

Method of Evaluation

There are two methods of evaluation for this course. Students may elect to take the course for 1 credit or for 3 credits. The differences are as follows:

1 Credit:	3 Credit:
<ul style="list-style-type: none"> ● Participation: 20% ● Discussion posts (3x/semester): 10% ● Group debate: 20% ● Midterm abstract (1 page): 20% ● Final paper (4-6 pages): 30% 	<ul style="list-style-type: none"> ● Participation: 20% ● Discussion posts (weekly): 10% ● Group debate: 20% ● Midterm abstract (1 page): 20% ● Final paper (8-10 pages): 30%

Grading

The following identifies how points translate into letter grades for the course:

Grade	Percentage
A+	98–100 %
A	93–97.9 %
A-	90–92.9 %
B+	87–89.9 %
B	83–86.9 %
B-	80–82.9 %
C+	77–79.9 %
C	73–76.9 %
C-	70–72.9 %
D	60–69.9 %
F	59.9% and below

Rubrics will be provided in advance of the assignments' due dates (abstract, debate, and final paper) to ensure students are aware of how they will be assessed.

Late Assignment Policy

Assignments are due on the dates/times identified. Late midterms will be deducted 1.5 points (out of 20 points) (equivalent to a 1/2 letter grade). Midterms will not be accepted after Nov 23rd. After that date, they will receive a 0 for the assignment. Late finals will be deducted 3 points (out of 30 points). Finals received after the deadline requires prior faculty approval. The instructor may grant extensions to students for emergencies, if requested in advance of the due date.

Participation

Participation is expected during in-class discussion following the guest lectures. All students are also expected to attend and participate in the discussion portion for all five debates, which will also count towards participation evaluations.

If you need to miss class due to observance of religious holidays, please notify us in advance.

Weekly Discussion Posts

In addition, as preparation for weekly discussions with lecturers, students are expected to prepare a thoughtful and critically reflective statement related to the week's readings/videos/other materials. Weekly reflections should be posted on the discussion board **by midnight the day before the respective class session**. Students will be assigned 2 short readings or other materials (e.g., podcasts, videos, etc.) related to the class topic in advance. Posts should be roughly 250-350 words.

When posting to the board, you may respond with your own observations or comments on what you find interesting, controversial, or useful in the assigned materials. These statements should be used to help stimulate questions and issues, and to set the agenda for in-class discussions. Posts will be evaluated based on critical thinking, analysis and application and synthesis of reading material. Students are also encouraged to respond thoughtfully to posts by other students. **The posts will be shared with the guest lecturer on the day of class** for them to read in advance so that they can orient their discussion towards the areas that were most interesting to the students and to help guide the Q&A.

Students taking the class for 1-credit are required to **post 3x per semester**, in advance of a guest lecturer. Students taking the class for 3-credits are required to **post each week**, in advance of a guest lecturer. Posts are not required on debate days.

Group Debates

We will have **five in-class debates**. The debate topics are focused on topical sustainability challenges. The structure and terms of the debates will be discussed during the first class (and noted below). You will have an opportunity to indicate preferences for your debate topic. You will be assigned to a debate group by the third class.

Grades are assigned as a group, not for each individual member. An important part of your professional career will be learning how to work and lead in groups, even if every member does not contribute equally. This involves assigning roles, developing a work plan, creating and sticking to deliverable deadlines, and mediating conflicts if they arise. We expect that all students will treat one another with respect as you navigate group dynamics and project work. We suggest that groups set the norms and guidelines for their group collaboration. For example: meeting expectations; listening carefully; hearing from all group members; confronting without trying to shame; calling in rather than calling out; etc. If you do have a serious issue with a group member, contact the professors or instructional assistant.

There will be two sides to each debate: affirmative (pro) and negative (con). Each side will present their position with an opening statement (affirmative goes first). This will be followed by short rebuttals from each side, and then closing statements from each. The debate will conclude with audience questions.

- Opening vote tally (yes/no)
- Affirmative opening statement: 4 minutes
- Negative opening statement: 4 minutes
- *Break: 2 minutes*

- Affirmative rebuttal: 3 minutes
- Negative rebuttal: 3 minutes
- Affirmative closing statements: 4 minutes
- Negative closing statement: 4 minutes
- Audience questions (moderator fields questions): 10 minutes
- Closing vote tally (yes/no/undecided)

Tips/Notes on Format:

- Opening statements: Clearly state the question and your team’s position. Present the major arguments for that position, and support those with reasoning and evidence (including specific examples and noting the sources for all evidence. They should be reputable and citable!)
- Rebuttals: Respond to opening statements by questioning and refuting their arguments. Focus on the substance of the opposing team’s arguments. Avoid arguing over specific language or terminology. You should know enough about the opposing sides’ general arguments (through your own research before the debate) to be prepared with evidence refuting their points.
- Closing statements: Summarize your team’s arguments and present concluding points.

No PowerPoints or other visuals will be allowed. These are oral arguments only, so you can’t rely on slides to keep your audience focused. Keep your argument down to a few key points. You want the audience to understand and take your side, so concise, reasoned arguments are stronger than listing 12 reasons. Less than five points keeps your debate presentation brief and coherent but memorable. Choose the strongest points that demonstrate your position on the issue. Try not to bombard the audience with statistics; they won’t follow it all. Use a few key data points that support your argument.

There is no written output required, however it is important to come prepared, having done sufficient background research. Teams will be judged on the structure and presentation of their arguments and use of supporting facts, data, evidence, and examples. It is up to each group to ensure that each team member has contributed to the debate preparation and execution. You may assign your roles internally.

Midterm Abstract and Final Paper:

Please note that the midterm abstract and the final paper are required for all students.

- 1 credit students:
 - 1-page Midterm Abstract + initial reference list
 - Final Paper: **4-6 pages**, double-spaced
- 3 credit students:
 - Midterm Abstract + initial reference list
 - Final Paper: **8-10 pages**, double-spaced (you will be deducted for going over)

Midterm Abstract:

All students are required to turn in the 1-page abstract for their paper midway through the course (Due: October 18). This allows opportunity for feedback early in your process. Abstracts are concise summaries of full research papers often requested in advance of the full paper's completion. Abstracts should include the following – the major topic(s) you will address, the problem/purpose of the paper, scope of the work, your methodology and thesis, short summary of relevant case material, and your expected findings/conclusions. It is not a table of contents, outline, or introduction to the report; it is a short summary of your final paper (see below for more detail). We will share a rubric in advance of the deadline. We will also share some examples on Canvas.

Final Paper:

Choose a sustainability topic to analyze and develop a policy or management recommendation using an evidence-based approach (Due: December 6). You are surveying and analyzing a sustainability problem and developing a recommended course of action based on a reasoned analysis, with a scientific basis for your rationale. Your paper should include the following elements:

- (1) introduction,
- (2) thesis statement,
- (3) relevant background information, including data, case studies and/or prior findings that inform your analysis,
- (4) your analysis of the policy implications, including the development of new policies if warranted,
- (5) conclusions, recommendations, and rationale for any further work.

You must support your arguments, key points, and analysis with clear evidence, logic, or theory. This is not an opinion paper or a reflection piece. **All sources and evidence must be properly cited and referenced in your paper.**

While many sustainability challenges are global, solutions are place-based, and analyses should consider local and regional impacts. To reflect this, **please select a specific geographic location**, i.e., regional, city, state, etc. Your recommendation should also be directed **to a particular audience**, i.e., non-profit, corporate, government, depending on the issue. (Think about who would implement your recommendation!)

Make sure you **clearly introduce and identify the scientific problem/challenge** you are seeking to address, including the scientific basis, and the policy or policies you are analyzing and recommending. Ensure you understand the possible solutions that have already been proposed to address the problem/challenge. Depending on the problem, a solution could be specific policy actions or, in some cases, further scientific study. If the latter, articulate what sort of additional scientific research might be needed. If the science is already clear enough to act on, what are the policy options and how do they compare? Are there case studies to learn from (from other problems in that location or similar sustainability problems in other places)? **Make a recommendation based on your analysis of the problem.** Assess the overall effectiveness of your recommendation in addressing the problem it is supposed to resolve.

Finally, **consider issues of equity and justice in your evaluation of the problem and potential solutions.** Are historically marginalized or underserved communities going to benefit from the solutions proposed?

Will they be made worse off? Have the needs and considerations of the communities most impacted by the problem been involved in developing the solution? If not, how might they be?

The additional questions posted below are provided to help guide your analysis; you do not have to provide answers to all of them. It's recommended that you consider the ones that are most pertinent to your topic and explore those in depth.

The sustainability problem:

- Why is this a critical problem that warrants attention?
- What is the scientific basis for the problem you are trying to solve?
- Are there areas of scientific uncertainty related to the problem or solution(s)?
- What are the equity and justice considerations and/or impacts? More specifically, how does systemic racism underlie the problem?

The institutional setting:

- Who are the key stakeholders (e.g. political actors, communities, NGOs, activists, businesses, etc.)?
- What are the equity concerns for impacted communities/stakeholders?
- Who is affected by the problem and who was (or is) causing the problem?
- What are the stakeholders' perspectives and interest in the problem?
- Do relevant key political actors care?
- Where is the problem you are analyzing and how does the location impact the problem and possible solutions?

The possible solutions:

- What policy solutions have been proposed, if any? Describe and compare solutions.
- Have such policies, programs, or actions been successful in other cases/places?
- What factors contributed to that success? What lessons (good or bad) can be drawn from those cases to this situation?
- What are the political realities facing the solution(s)?
- Are there technological solutions available to address the problem?
- Is more research needed before solutions can be considered?
- How willing are affected stakeholders going to be in complying with the policy?
- Do the organizations who would implement your recommendation have the capacity to do so?

Paper Format:

- Citations/references must be formatted according to APA style. Here's a good resource: https://owl.purdue.edu/owl/research_and_citation/apa_style/apa_style_introduction.html
References will not count towards the page limits.
- All information that is directly quoted must be placed in quotation marks and cited in text. Be sure to ***give reference even when you summarize the main idea of something***. Properly refer to any tables or data sources that you use in the text as well as in your bibliography.
- **Include a minimum of 10 sources.**
- Use Size 12 font, Times New Roman, 1-inch margins all sides, double spaced, with page numbers.
- Include a title. Use clear headings, as appropriate.

- Include an updated abstract (not included in above page limits, but no longer than 1 page). The final abstract summarizes the paper's topic and key findings; it is not an outline in narrative form, nor is it an introduction. It should have its own introduction, problem statement, approach, findings, conclusions, and recommendations. It should emphasize key ideas or results. It is a concise description of your full paper.
- You may include appendices, such as tables, graphs, or other supplemental data if it is relevant and clearly discussed and cited in the text of your paper. Appendices will not count towards the page limits.
- Submit your paper on Canvas as a Word document (**not a PDF!!**).

If you have any questions about how to structure the paper, or would like feedback on your topic, please reach out to Professor Alison Miller (acm2179@columbia.edu), Professor Hayley Martinez (hjm2120@columbia.edu), or Charlotte Munson (cmm2350@columbia.edu).

Commitment to Diversity, Equity, Inclusion, & Antiracism

SUMA & CS DEIA

The MS in Sustainability Management program and its co-sponsors – the School of Professional Studies and the Columbia Climate School – are committed to anti-racism. From the perspective of our program specifically, anti-racism is especially pertinent because the pursuit of equity is bound with the pursuit of sustainability. The program is implementing measures to improve diversity among its faculty, students, and staff, as well as to integrate equity concerns in its curriculum.

It is our intent that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and that the diversity that the students bring to this class be viewed as a resource, strength and benefit. It is our intent to present materials and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture.

School of Professional Studies DEIA Resources can be found here:

<https://sps.columbia.edu/ideas-impact/deia/university-resources>

Information on the DEI work at the MS in Sustainability Management Program can be found here:

<https://www.sustainability.ei.columbia.edu/dei>

University resources for promoting racial justice and combating bias can be found here:

<https://universitylife.columbia.edu/content/resources-promoting-racial-justice>

Names/Pronouns

You deserve to be addressed in a manner that reflects your identity. You are welcome to tell the instructors your pronoun(s) and/or name (if different from University records) at any time, either in person or via email.

Accessibility

I want you to succeed in this course. Columbia is committed to providing equal access to qualified students with documented disabilities. A student's disability status and reasonable accommodations are individually determined based upon disability documentation and related information gathered through the intake process. For more information regarding this service, please visit the University's Health Services website here: <http://health.columbia.edu/services/ods/support>. Contact disability@columbia.edu for learning accommodations.

Discrimination

We embrace the diversity of gender, gender identity & expression, sex, sexual orientation, race, ethnicity, national origin, age, religion, disability status, family status, socioeconomic background, and other visible and nonvisible identities. Columbia University does not tolerate unlawful discrimination, discriminatory harassment, sexual assault, domestic violence, dating violence, stalking, or sexual exploitation and all such conduct is forbidden by [Columbia University Policy](#).

Duty to Report

You deserve a University community free from discrimination, harassment, and gender-based misconduct including sexual harassment, sexual assault, domestic and dating violence, stalking, and sexual exploitation. It is therefore University policy to require Columbia faculty and staff to report to EOAA any instance or allegation of prohibited conduct involving any undergraduate or any graduate student that is disclosed to, observed by, or otherwise known to that employee. This requirement to report is in place to help ensure that students are provided appropriate resources and to allow the University to mitigate harm to our community. I have a duty to report potential issues of discrimination, harassment, and gender-based misconduct if I witness or am told about an occurrence.

Confidential Resources

There are confidential resources on campus who do not have a Duty to Report, including:

- Sexual Violence Response & Rape Crisis/Anti-Violence Support Center (SVR)
- Ombuds Office
- Medical Services
- University Counseling and Psychological Services
- University Pastoral Counseling
- Columbia Office of Disability Services

University employees working in a confidential capacity will not report information shared with them.

Columbia University Policies & Resources

Academic Integrity

Columbia University expects its students to act with honesty and propriety at all times and to respect the rights of others. It is fundamental University policy that academic dishonesty in any guise or personal conduct of any sort that disrupts the life of the University or denigrates or endangers members of the University community is unacceptable and will be dealt with severely. It is essential to the academic integrity and vitality of this community that individuals do their own work and properly acknowledge the circumstances, ideas, sources, and assistance upon which that work is based. Academic honesty in class assignments and exams is expected of all students at all times.

SPS holds each member of its community responsible for understanding and abiding by the SPS Academic Integrity and Community Standards posted at:

<http://sps.columbia.edu/student-life-and-alumni-relations/academic-integrity-and-community-standard>. You are required to read these standards within the first few days of class. Ignorance of the School's policy concerning academic dishonesty shall not be a defense in any disciplinary proceedings.

Columbia University Library

Columbia's extensive library system ranks in the top five academic libraries in the nation, with many of its services and resources available online: <https://library.columbia.edu/>.

SPS Academic Resources

The SPS Office of Student Affairs provides students with academic counseling and support services such as online tutoring and career coaching:

<http://sps.columbia.edu/student-life-and-alumni-relations/academic-resources>.

Copyright Policy

Please note - due to copyright restrictions, online access to this material is limited to instructors and students currently registered for this course. Please be advised that by clicking the link to the electronic materials in this course, you have read and accept the following:

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