**Unit 7 Lecture Notes (3 Parts, 60+ minutes)**

**Learning goals of unit and module**

1. Communicate accurately about the grand challenge of climate change.
2. Describe natural, social, and economic impacts of climate change.
3. Argue for strong policy to regulate carbon emissions to curb climate change.

This unit synthesizes the previous six units by inviting students to reflect on their experiences throughout the module, identify key learning moments and consider how these events influenced their knowledge and altered their assumptions about the grand challenge of climate change. It reinforces systems thinking and introduces the final assignment.

**Part 1. Metacognition Reflection (20+ minute Discussion and Activity)**

Begin by expressing the importance of understanding "how we learn" so that we can replicate and amplify the characteristics of high-quality learning throughout our educational experiences. *This will: A) improve the effectiveness and efficiency of classroom experiences in higher education by providing guidance to instructors regarding the creation of high-impact lessons; and, B) help us become life-long and high-performing learners through the recognition and nurturing of effective learning habits.*

Return the climate literacy assessment students completed prior to Unit 1 taking care to make sure that students receive their own assessment.

**Slide 1:** Provide students with two minutes to read their assessment and consider where their understanding, assumptions about, and knowledge of climate change has changed as a result of learning that occurred over the course of the module. Ask students to conduct a three-minute free write in which they reflect on their learning throughout the module.

Following the writing period, place students in groups of three and invite them to read their reflections to others in their group. *Encourage students to actively listen for, and ask questions about, moments in the module that brought about shifts in perspectives, events that challenged previously held assumptions and other significant impacts.*

Students should then write a brief list of actions they can take to increase the frequency of high-learning moments like these, and how they might integrate them into their coursework, classes and study habits.

**Part 2. Socio-Environmental Systems Thinking (20+ minute Discussion)**

**Slide 2:** Reflecting upon the **Module System Diagram** ask students some of the following questions to re-enforce systems thinking:

* Is this a reasonable depiction of the causes, effects, and solutions to global climate change?
* What additions or modifications would you make to this system diagram?
	+ Do any new feedback loops appear? (For example, actions by businesses and individuals motivated directly by an understanding of the social costs of carbon emissions in the absence of regulation.)
* What feedback loops exist in the policy development process? Which are more or less significant in this case?
* Who, or what types of professionals and other stakeholders, can play an important role in shaping the policy development process?
* How do elected officials, NGO's industry groups fit into the policy discourse part of the system?

For advanced and/or policy students:

* What leverage points could be used to accelerate policy?
* How do the concepts of conflict, collaboration and education fit into the system?
* Have you identified any new leverage points that are critical to understanding the socio-environmental system of climate change?

Then ask students to consider systems thinking more broadly by asking a few of these questions.

* How does the systems lens help address other grand social and environmental challenges?
* What other societal challenges should be thought of from a socio-environmental systems perspective?
* Can systems thinking help us achieve solutions to environmental and other challenges more efficiently?
* What happens when policy is implemented with an incorrect or incomplete perception of the socio-environmental system? (Answer: unexpected consequences, “policy leakage”. For example, regulations that constrain logging in one place without reducing demand for timber are likely to lead to more logging somewhere else)

**Part 3. Regulating Carbon Emissions to Curb Climate Change (20+ minute Discussion)**

This final discussion introduces students to the final writing assignment where they will demonstrate their integrated understanding of the science, economics, and law behind the regulation of carbon emissions. The [file 99969 'Op-Ed writing assignment'] is a Role, Audience, Format and Topic (**RAFT**) writing exercise. The RAFT method encourages students to critically interpret and analyze the interests of diverse audiences embedded in a social network and write to a target audience with the intention of persuading them to adopt a specific position.

Ask students, given what they have learned,

* What should be done about climate change?

Students will likely suggest individual behaviors (drive less, turn off lights). These behaviors positive but won’t by themselves get the job done. Encourage them to think on a bigger scale by asking one or more of the following:

* What can be done to curb climate change through policy action?
* Is the Clean Power Plan sufficient for the U.S.? Why or why not?
* What are the challenges (technical, economics, political) in formulating and implementing meaningful policy action?

Remind them that policy formulation and implementation is an iterative process that will continue to evolve in the U.S. That is why it is so essential for citizens to be informed and engaged with elected officials and other decision makers at all levels of government.

**Slide 3:** The **Op-Ed writing assignment** gives them an opportunity to apply what they have learned about the science, economics, legal foundations and politics of climate changes in making a persuasive argument for the regulation of carbon emissions. Remind them of the module learning goals (on slide) and explain they will demonstrate their ability to do these things with this assignment.

*The assignment is purposefully vague about the scope of the policy. The module was designed with federal policy, CPP specifically, in mind. However, state policy might be more interesting in some cases (e.g., California and NE states in Regional Greenhouse Gas Initiative). International policy may be more relevant to some courses. You can specify in class what level of policy action and modify the assignment and rubric accordingly. Updated information on the legal status of CPP and carbon emissions regulation in the U.S. are provided in References and Resources at the end of Unit 4.*

**Slide 4:** Students need to be assigned or offered an opportunity to choose a Role, Audience, and Format in order to complete the assignment. A table of potential Roles, Audiences, and Formats is shown in the slide and downloadable from the Instructor webspace (*but not the Student Materials page*). These RAF can be used as is or adapted to your local context and/or to suit the course level and discipline.

The assignment is available on the Student Materials page and includes a **grading rubric** to guide students in the preparation of their responses. *We highly recommend that you explicitly review the grading rubric with students in class and make clear your expectations.* The Op-Ed assignment is made available as a Word document for ease of modifying the assignment or rubric to suit the needs of the class. The rubric should also be used to assess the quality of student responses during grading.