

## NRES 441: Climate Change Implications, Policies and Solutions

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Spring 2020  
University of Wisconsin-Stevens Point  
College of Natural Resources

3 credits  
Classroom: TNR 271  
Lecture: W 11-11:50 am  
Discussion: Thu 9-10:50 am

### Instructor

#### Dr. Shiba Kar

Office: TNR 180B; Meeting hours: T 10-11 am, W 2-3 pm or by appointment  
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### Course Description

Many communities and ecosystems around the world have observed warming of the climate system and changing climate patterns. This course will focus on addressing climate change implications on the sustainability of the social-ecological systems. We will explore climate change impacts on biosphere, people and societies; identify resource management and community sustainability challenges. We will introduce potential actions and approaches of climate adaptation, mitigation and policy solutions that would help students gain hands-on experience in developing resilient community and sustainable management approach of natural resources and ecosystems. To gain real-world experience of addressing climate change issues, students will be engaged in examining actual place-based impacts and community practices and developing a semester project focused on community adaptation plan and actions.

### Course Philosophy

Students learn best when they are applying what they learn. In this course, lectures will be used to illustrate important concepts and discussion will (most of the time) be focused on application of lecture and reading materials to complete your semester project successfully. I am here to facilitate your learning by providing tools, data, and assistance in finding information you need.

### Learning Outcomes

In addition to the tasks listed above, students will develop several professional skills in this course. Upon successful completion of this course, students will be able to:

1. Explore and assess implications of climate change on social-ecological systems in real-world perspectives
2. Examine and apply tools and methods for adaptation planning and policy solutions of climate change
3. Strengthen skills on how to collaborate and work effectively in team-environment
4. Communicate plans and ideas in writing and orally to peers and public

## **Readings**

All required and supplemental readings are posted in CANVAS.

## **Attendance and Grading**

Attendance is mandatory in all lecture and discussion classes. You are also expected to actively participate in classes and complete your work on time. If any problems arise, please contact us as soon as possible. There will be no makeup assignments, exams or reflection questions unless you have made prior arrangements with one of the instructors. All late assignments will be met with a 10% reduction in your grade each day (including weekends). That said, we expect this class to be fun, and you will be given multiple opportunities in class to ask questions and think about how you will apply course concepts to your case. You will also need to spend a considerable amount of time outside of class working on developing your community adaptation action plan. **Details for all group and individual assignments will be introduced in class as we progress.**

## **Assignments**

### ***I. Public perception survey***

One of the biggest challenges in addressing climate change issues is lack of public awareness and climate literacy. To learn more about public perceptions and understanding on climate change issues, you will be assigned to a group and your group will conduct a brief in-person campus survey (3 surveys each group member). You will then compare, analyze and summarize the survey findings, review existing literature on public perceptions on climate change and submit a 2-page (about 1,000 words, single-space) written report in CANVAS.

### ***II. Climate change impact- case study***

As we explore implications of climate change on different aspects of social-ecological systems, you will be assigned to a group to select a case from a list that may include impacts on forest ecosystem, food and agriculture, water and sea level rise, human health, industry and energy supply. As a group, you will examine and review the relevant literature to give a detail presentation on the selected topic in class.

### ***III. Climate action plan assessment***

To be proactive in addressing climate change issues, many countries, states and local government have developed climate action plan to adapt with and mitigate the changes. To make you familiar with these action plans and to prepare you for the semester group project (below), each member of your group will assess a different plan from given list and, as a group, you will submit a comparative analysis of strengths and weakness of the plans with your recommendations (3-pages).

### ***IV. Semester Group Project: Community adaptation plan and action***

Based on your understanding of potential climate change impacts and familiarity of methods/strategies of climate action plans, your group will be developing a community adaptation and action plan. You will choose a county/municipality within Wisconsin or beyond (who currently does not have such plan), contact the relevant officials for more insights, data and information and, then, develop an adaptation

plan and strategies for actions. This is the key lesson of this course that provides you real-world experience of utilizing existing data and information and applying tools and methods to develop an adaptation plan and find policy solutions to deal with changing climate patterns. There are three components in the assignment—(i) you will gather all relevant data and information, develop an outline and work on the plan as a draft (more than 60% complete), (ii) present plan and ideas in class and then, (iii) considering instructor’s and class feedback, complete the final report and submit in CANVAS. As I expect your best effort within your group project, **grades can be changed by up to 20 points** to address situations where student performance within the group does not meet expectations.

***V. Climate change communication***

To learn how to communicate climate change issues to public and other targeted stakeholders, this assignment will ask you to develop a 1-pager announcement with graphics and key communication messages on climate change issues to take actions.

***VI. Reflection Questions/ class participation***

Reflection questions (RQs) will be completed randomly in either lecture or discussion section during the semester to assess your content knowledge and identify areas that need clarification. You will either be asked questions based on material from lectures, discussions, and readings, or will be asked to identify concepts about which you are unclear in class and need additional help. Attendance of class lectures and active participation in class discussion is mandatory. No make-up for these RQs will be allowed. Your top 10 scores out of 12 RQs will be added to the grade (10 points each, total 100 points).

***VII. Mid-term & Final Exam***

There will be two exams consisting of multiple choice, short answer, and/or essay questions. The exams must be taken during the scheduled times and make-up exams will not be given unless there is a documented, valid reason for missing the scheduled exam.

**Summary of Deadlines / Assignments**

Due Date	Assignments	Brief Description	Points
Week 3	Group	Public perception survey	50
Week 5	Group	Impact study Presentation	50
Week 7	Group	Climate action plan assessment	50
Week 8	Individual	Mid-Term Exam	50
Week 10	Group	Community adaptation plan and action report- draft	20
Week 12	Group	Presentation on community adaptation plan	50
Week 14	Group	Community adaptation plan and action final report	50
Week 15	Individual	Climate change communication	30
Finals	Individual	Final Exam	50
Assignments must be submitted to CANVAS unless otherwise noted.			
	Individual	Class participation/ Reflection Questions	100
<b>Total</b>			<b>500</b>

*Percentage ranges for letter grades*

<b>A</b>	93-100%	<b>B</b>	83-86%	<b>C</b>	73-76%	<b>D</b>	60-66%
<b>A-</b>	90-92%	<b>B-</b>	80-82%	<b>C-</b>	70-72%	<b>F</b>	below 60%
<b>B+</b>	87-89%	<b>C+</b>	77-79%	<b>D+</b>	67-69%		

**Academic Integrity, CANVAS, and turnitin.com**

Familiarize yourself with the academic honesty policy of UWSP. In a nutshell, if you cheat, plagiarize, or turn in work other than your own, you will at a minimum receive a zero on that assignment. The CANVAS dropboxes are linked to turnitin.com. This means that everything you submit is compared to multiple other sources to check for originality. We encourage you to turn in a copy of your work early and check the report generated by turnitin.com. If there are issues with originality, you can address them and then turn in another copy of your work, thus negating any chance of you losing points on your assignment for plagiarism.

**Accessibility Statement**

If you have a learning or physical challenge which requires classroom accommodation, please contact the UWSP Disability Services office with your documentation as early as possible in the semester. 103 Student Services Center, (715) 346-3365; TTY (715) 346-3363; [www.uwsp.edu/special/disability/studentinfo.htm](http://www.uwsp.edu/special/disability/studentinfo.htm)

### Course Schedule

The instructor reserves the right to make changes to the syllabus and schedule when necessary to meet the learning needs of the students, compensate for cancelled classes or other unforeseen circumstances.

	Topic	Reading	Assignments: **Due: Friday at 5 pm to CANVAS
<b>Week 1</b> 1/22-1/23	Lecture	Syllabus, icebreaker – Overview on Climate Change Issues	
	Discussion	Begin: Survey and literature review on climate change perception History of Earth’s climate (Eggleton 2013, Ch. 8, 9)	
<b>Week 2</b> 1/29-1/30	Lecture	Factors forcing climate change	
	Discussion	Reading Discussion NASA: <a href="http://climate.nasa.gov/causes/">http://climate.nasa.gov/causes/</a> (Eggleton 2013, Ch. 3 & 4)	
<b>Week 3</b> 2/5-2/6	Lecture	Climate change research, models and predictions	<b>**Survey results summary</b>
	Discussion	IPCC Synthesis Report for Policymakers Survey results Discussion; Exercise- Climate change myths and facts Begin: Climate change impact- case study	
<b>Week 4</b> 2/12-2/13	Lecture	Climate change impacts on Biosphere and societies	
	Discussion	NOAA: <a href="http://www.noaa.gov/topic-tags/climate-impacts">http://www.noaa.gov/topic-tags/climate-impacts</a> Reading discussion- impacts on biosphere and communities	
<b>Week 5</b> 2/19-2/20	Lecture	Impact case study presentations	<b>Case Studies (In-class)</b>
	Discussion	<a href="https://nca2014.globalchange.gov/">https://nca2014.globalchange.gov/</a> Impact case study presentations Begin: Climate action plan assessment assignment	
<b>Week 6</b> 2/26-2/27	Lecture	Climate change adaptation	
	Discussion	NRC- National Academies 2010; IPCC Report on Adaptation; U.S. Climate Resilience toolkit Reading Discussion Begin: Project on community adaptation plan and action	
<b>Week 7</b> 3/4-3/5	Lecture	Climate-Smart conservation and Community resiliency	<b>**Action plan assessment</b>
	Discussion	Stein et al. 2014. Climate-Smart Conservation: Putting Adaptation Principles into Practice; Work session: adaptation planning; Exam review	
<b>Week 8</b> 3/11-3/12	Lecture	Mid-Term Exam	<b>Mid-Term Exam</b>
	Discussion	EPA community-based adaptation 2015; WICCI report Discussion on place-based evidences and practices Work session on community adaptation plan	

<b>March 16-20</b>		<b>Spring Break!</b>		
<b>Week 9</b> <b>3/25-3/26</b>	Lecture	Climate change, culture and Traditional ecological knowledge	UCS: Importance of Traditional Ecological Knowledge, 2017; Tribal adaptation toolkit: <a href="https://toolkit.climate.gov/tool/tribal-climate-change-adaptation-planning-toolkit">https://toolkit.climate.gov/tool/tribal-climate-change-adaptation-planning-toolkit</a>	
	Discussion	Work Session: Traditional practices in tribal lands		
<b>Week 10</b> <b>4/1-4/2</b>	Lecture	Climate change communication and raising public awareness	Yale Climate Change communication program: <a href="https://climatecommunication.yale.edu/">https://climatecommunication.yale.edu/</a>	<b>** Draft project report due</b>
	Discussion	Work session: Effective climate change communication Begin: climate communication assignment		
<b>Week 11</b> <b>4/8-4/9</b>	Lecture	Climate change mitigation	IPCC 2014: Report- Mitigation; U.S. CC mitigation: <a href="https://nca2014.globalchange.gov/report/response-strategies/mitigation">https://nca2014.globalchange.gov/report/response-strategies/mitigation</a>	<b>**Climate change communication piece due</b>
	Discussion	Work Session: Energy, greenhouse gas metrics and mitigation pathways		
<b>Week 12</b> <b>4/15-4/16</b>	Lecture	Guest speaker, TBD		
	Discussion	Work with your group on completing adaptation project		
<b>Week 13</b> <b>4/22-4/23</b>	Lecture	Climate change and economics	RFF Paper (2006): The Economics of Climate Change	<b>**Project report due</b>
	Discussion	Work Session and reading discussion		
<b>Week 14</b> <b>4/29-4/30</b>	Lecture	Policy tools: carbon trade, tax, dividend	OECD 2015. Climate Change Mitigation: Policies and Progress, Ch 1	
	Discussion	Work session: Mitigation policy tools and practices		
<b>Week 15</b> <b>5/6-5/7</b>	Lecture	Climate policy and negotiations	UNFCCC 2015_ Paris Agreement; <a href="https://unfccc.int/documents">https://unfccc.int/documents</a> ; <a href="https://sustainabledevelopment.un.org/sdgs">https://sustainabledevelopment.un.org/sdgs</a>	<b>**Project group presentations (in class)</b>
	Discussion	Work session: policy debate; Group presentations		
<b>Final Exam</b> <b>May 11, Monday; 8:00- 10:00 am, TNR 271</b>				