ESCI 5310 Interdisciplinary Environmental Problem Solving
ESE 6307 Interdisciplinary Problem Solving
Fall 2019

Class: F 9:30-12:20 Classroom Building C204
Some classes will be taught in Prospect Hall 300

Instructor

Dr. Deana Pennington
Department of Geological Sciences
GEOL 305C
ddpennington@utep.edu
Office Hours: Friday 12:30-1:30 after class or by appointment

TA

Nakul Karle nnkarle@miners.utep.edu

General Information

Scientific synthesis across disciplines is at the heart of addressing important challenges such as trade-offs between water, food, and energy; declines in biodiversity and ecosystem services; and the need for sustainable cities. In this course students will gain the knowledge, skills, and attributes necessary to work collaboratively in interdisciplinary teams on complex socio-environmental problems, using an active learning approach. The course will focus on learning to integrate diverse knowledge, perspectives, methodologies, and data using socio-environmental water systems as an exemplar problem.

Prerequisite: Graduate standing

Course Objectives

- Know the fundamental issues underlying sustainability science and engineering
- Understand the challenges and opportunities working across disciplines
- Learn how to analyze complex socio-environmental problems using qualitative and semi-quantitative modeling techniques
- Connect the workings of socio-environmental systems with implications for sustainability
- Think creatively about how policy and management alternatives impact sustainability
- Communicate concisely across disciplines and perspectives about complex socio-environmental problems

Course Texts

No required textbook.

Blackboard: I will use Blackboard for assignments and to send announcements to the entire class. I rarely check my email in Blackboard, so please do not attempt to contact me through the system. Email me directly at ddpennington@utep.edu.

Packback Questions: This is an online discussion system, described in more detail below. It is $25 per student for the entire semester and *is required*. If you were registered as of Monday, you should have an email with registration instructions from Packback and a link that will access the course directly. If you lost the email, you can register here: https://www.packback.co/. You will need the community access code: fc2f38e1-2a26-4631-b0dc-70efbd3cfca6

Readings of journal articles will be assigned every week for the first eight weeks of the semester. These readings will be made available to you in one of the following ways (depending on logistics and copyright issues):

- on the Internet (e.g., certain open-access journal articles and websites); or
- from a UTEP library database (go to the UTEP library home page and type the exact name of the journal's title into the search window under E-Journals. This usually results in your being able to access the journal from one or more sources.

Academic dishonesty

A student's submission of work for academic credit indicates that the work is the student's own. Any outside assistance should be acknowledged. *This includes entries into Packback, which must be appropriately sourced*. While cooperation in teams throughout this course is mandatory, the homework assignments *must be constructed and written by each individual student*. The only exception is a group presentation at the end of the semester, which will be a group effort.

Academic deadlines

The UTEP Fall 2019 drop deadline is November 1st. The College of Science will not approve any drop requests after that date. If you have any concerns about whether or not to drop, please see me.

Makeup policy

Due dates are firm. No late Packback activity will be accepted.

Students with Disabilities

Students with disabilities are encouraged to meet with the instructor in order that course materials can be updated and adapted appropriately to better foster a positive teaching and learning experience.

Grading

This is an active learning class. Your grade is almost entirely based on engagement in hands-on activities and discussion, inside and outside of class. The only written assignments are in Packback, which will act as a place to discuss the readings and other topics that come up in class. Please read the sections below for a description of each of the grade categories.

Attendance	5%
Reading & Packback	50%
Teamwork Assessment	15%
Team Presentation	20%

Field trips (2)	10%
Total	100%

A course grade of Incomplete will only be given in extraordinary circumstances. If a student has missed a significant amount of work (e.g. multiple assignments or tasks), a grade of Incomplete is not appropriate or warranted. All grades of Incomplete must be accompanied by an Incomplete Contract, signed by the instructor of record, student, Geology Department Chair, and the Dean of Science. The College of Science limits the due date to one month after the end of class.

Attendance (5%)

Much of the class will be based on working within a team. This work cannot be made up. It is essential that you be in class and be there on time. You simply cannot contribute effectively to your team if you straggle in late, or do not come at all. Class will start promptly at 9:30. Sign in as you arrive at each class. You will receive full credit if you arrive by 9:30; half credit if you arrive after 9:30; no credit if you are not there by 10:00.

If you must miss class, it is imperative that you make arrangements with your team, preferably BEFORE you miss. You must establish mutual respect and trust, partially based on their belief that you will contribute your part and will not miss class unnecessarily. As soon as possible after the missed class contact your team to a) find out what they did; and b) find out how you can still contribute. Some assignments cannot be made up. For example, your team presentation must occur on November 29. If you cannot make this date, work with your team to record your part of the presentation in advance, or to videoconference in during the presentation. It is your responsibility, not the instructor's, to figure out how to do either of these.

Please be aware that ***you lose points*** when you miss class, even if you have a valid excuse (field trip, conference, etc.). This is because your team mates pay a price regardless of your reason for missing, and therefore so should you. It also helps ensure that you do not take missing class lightly.

Readings and Packback Questions (50%)

Group discussion and reflection on the material is an essential component of this course, and the Packback Questions platform will be used for online discussion about class topics and the assigned reading. Packback Questions is an online "curiosity community" where you can fearlessly ask BIG questions about how what we're studying relates to the real world, team experiences you may have had in the past and anticipate in the future, and the role of interdisciplinary research in 21st century science. For a brief introduction to Packback Questions and why we are using it in class, watch this video: vimeo.com/packback/Welcome-to-Packback-Questions

Your participation on Packback will count towards **50 percent of your final grade**. We will use Packback for 10 weeks, so your activity in Packback each week is 5% of your grade.

Each week the instructor (via the TA) will post one question on Packback during class. You must answer that question. That question will be "pinned" to the top so that it is the first thing you see

in your Packback Feed. In addition to answering the instructor's question, each subsequent week through week 10 you are required to post 1 Packback question yourself and post 1answer to a classmate's question, each week. Your question should be about the reading assignment, something we have been discussing in class, or a related topic. Your question will be due on Sunday night at 11:59 pm. The reading assignments will be posted on Blackboard at least one week in advance of this due date in case you need to read in advance. Your two answers should respond to the question posted by the instructor, and to one question posed by your classmates and are due Tuesday night at 11:59 pm. That is the reason for the question being due on Sunday – to give classmates time to respond with answers before the deadline Tuesday night. ***NO partial credit will be given for late postings*** under any circumstances. The online discussion will move quickly. Like any internet-dependent tool, networks and servers occasionally go down. Do not wait until the last minute to try to do your postings Sunday night and Tuesday night. Also, note the deadline is 11:59 pm – NOT midnight. This is a constraint of the system.

Before you start posting, be sure to read the **Community Guidelines** found in the tutorial on Packback. If your post doesn't follow the Packback Community Guidelines, there is a chance it will be removed and you won't receive points for that post.

Your Readings & Packback grade will be based two things: 1) a count of your postings (1 question/2 answers each week) – 20%; and 2) the *quality* of your postings (30%). Packback has an algorithm that calculates "Curiosity Points" based on the complexity of the content (length, weblinks, color, font, etc.). *I do not use that feature*, since it is based more on format than quality of the content. Rather, *every* posting will be read by myself and assigned a quality grade. I will let you know that grade through a feedback option on each posting. Be sure to check your quality feedback, especially early in the semester, to see what suggestions I have made for improving the quality of your posts.

Each week in class we will spend some time highlighting discussions from Packback. These will be posted in advance of class as a Featured posting. However, the system also Features postings automatically so it is difficult for you to distinguish posts that we Feature from system Features. To solve this problem, when we Feature a posting we will also give Praise feedback, which will be viewable by everyone.

Teamwork Assessment (15%)

This will be comprised of three assessments. The first two will entail each student assessing how well each person on your team is performing within the team, including a self-rating. These will happen at two different times during the semester. The third will be my assessment of each team members contribution.

Team Presentation (20%)

At the end of the semester, each team will prepare and deliver a presentation to the class. More details about the presentation will be provided in class.

Students are responsible for dividing the work among themselves equitably. Each student is responsible for contributing to their group in meaningful ways. Be aware of the following descriptions of team members:

Loafer (noun). A person who idles time away and does not contribute.
Synonyms: deadbeat, layabout, good-for-nothing, lounger, shirker, sluggard, laggard, slacker, slob, lazybones, bum, drone – DON'T BE ONE OF THESE

Antonyms: doer, go-getter, hustler, self-starter – BE ONE OF THESE

I will use an online teammate rating system to assess how well teams are working together, how well each team member is contributing, and intervene if necessary. This will be an anonymous assessment that enables each team member to rate themselves and their teammates on a wide variety of criteria.

Field Trips (10%)

Students must attend two field trips on their own or in self-organized groups, selected from a menu of options. These are tours and other free events that are open to the public related to water issues in this region. Transportation to the event must be arranged by the student. The list of options is available in Blackboard, and will be updated as new events are identified.

To receive credit for attending an event, take a selfie with the guide and/or the facility sign as evidence that you attended. Email the photo to the TA.

Tentative schedule

DATE	TOPIC	READ	ASSIGNED
30-Aug	Introduction to the course; Interdisciplinary problem solving Activity: Challenges and Opportunities in Interdisciplinary Research	Rittel & Webber, 1973; Fiore et al., 2018	Packback 1 Q Sunday 2 A Tuesday
6-Sep	Wicked problems; Sustainable Development Goals Activity: C-Roads World Climate	Hall & O'Rourke, 2014	Packback 1 Q Sunday 2 A Tuesday
13-Sep	Team assignments; Team member dispositions and disciplinary cultures Activity: Dispositional differences, Toolbox	Pennington, 2008	Packback 1 Q Sunday 2 A Tuesday
20-Sep	Learning across disciplines; team assignments Activity: Share Your Research	Hargrove et al, 2013 plus ABQ journal series	Packback 1 Q Sunday 2 A Tuesday
27-Sep	Introduction to regional water issues. Activity: Stakeholder Analysis	Binder et al., 2013	Packback 1 Q Sunday 2 A Tuesday
4-Oct	Problem bounding and framing Activity: Explore the Problem Space & Using Frameworks	TBD	Packback 1 Q Sunday 2 A Tuesday
11-Oct	Systems Thinking Activity: Mental Modeler	Zvoleff & An, 2014	Packback 1 Q Sunday 2 A Tuesday
18-Oct	Tools that integrate Activity: InsightMaker	Wiek et al., 2011	Packback 1 Q Sunday 2 A Tuesday; Team assessment
25-Oct	Anticipatory and strategic thinking Activity: SWIM	TBD	Packback 1 Q Sunday 2 A Tuesday
1-Nov	TBD	Select 1 from Rio Grande list	Packback 1 Q Sunday 2 A Tuesday
8-Nov	Interdisciplinary research proposals Activity: Mock Solicitation		
15-Nov	Activity: Mock Solicitation		
22-Nov	Thanksgiving holiday		
29-Nov	Team presentations		Presentation
6-Dec	Dead day – no class		Team assessment
	No final		

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Rittel, H. W., & Webber, M. M. (1973). Dilemmas in a general theory of planning. *Policy Sciences*, *4*(2), 155–169.

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RIO GRANDE: Read Hargrove et al. 2013 plus choose a second article related to your discipline

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