

**COLORADO STATE UNIVERSITY**

**ESS 130 System Theory for Sustainability**

*Instructor:*

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*Graduate Teaching Assistant:*

**Anna Pfohl**, Department of Geosciences, CS 374, Anna.Pfohl@colostate.edu

*Times:* Fall 2019, Tue and Thurs, 3:30 – 4:45; Nov 5 – Dec 12, 2019

*Location:* Clark A102

*Prerequisites:* CS 110 or BUS 150 (BUS 150 has a challenge exam to test out)

*Office Hours:*

Moore – Wed & Thurs 9-10am NESB B204

Pfohl – Wed 12-2pm CS 374

**Course Objectives and Learning Goals**

- 1) Understand the fundamentals of Systems Theory and develop skills in Systems Thinking.
- 2) Gain experience in integrating systems theory and thinking into scientific practice when making observations, developing hypotheses and designing studies.
- 3) Develop skills to align data needs with system properties.
- 4) Become effective in developing data summaries (tables and graphs) and other forms of visualization that can be shared with a diversity of stakeholders.

**Course Schedule and Topics (subject to change)**

<b>Date</b>	<b>Course Topic</b>	<b>Readings &amp; Assignments</b>
<b>T Nov 5</b>	Course Introduction - What is a System?, Types of Systems, Properties of Systems	<b>DUE:</b> Weekly Reflection Nov 8 Assign Scientist
<b>R Nov 7</b>	Information - How information is used in Sustainability Science	<b>Reading:</b> Moore & de Ruiter 2012
<b>T Nov 12</b>	Hierarchic Systems – Boundaries, Feedbacks, Emergent properties, and Cases Studies	<b>DUE:</b> Weekly Reflection Nov 15 <b>DUE:</b> Assignment 1: Ecosystem Scientist Worldview <b>Reading:</b> Simon 1962 Assign Cards
<b>R Nov 14</b>	Systems Analysis – Observations, Hypotheses, Theory	<b>Reading:</b> Platt 1964, Cottingham et al. 2016
<b>T Nov 19</b>	Systems Analysis - Experimental Approaches	<b>DUE:</b> Assignment 2: Cards <b>DUE:</b> Weekly Reflection Nov 22
<b>R Nov 21</b>	Data Visualization	Assign Ecosystem Study
<b>T Dec 3</b>	Data Interpretation – Limitations and Biases	<b>DUE:</b> Weekly Reflection Dec 6 <b>Reading:</b> Easterbrook 2014
<b>R Dec 5</b>	Systems Analysis – Qualitative Analyses and Mathematical Analyses	<b>DUE:</b> Assignment 3: Ecosystem study
<b>T Dec 10</b>	Systems and Sustainability – Human Dimensions	<b>DUE:</b> Weekly Reflection Dec 13
<b>R Dec 12</b>	Final Exam	
<b>F Dec 13</b>	Final Portfolio due on canvas at 9 pm	

## Grading System

*Grading (Traditional Letter Grade) based on score out of 300 total points:*

- **Assignments – 100 points**

All assignments will be submitted via canvas. Please put your name, the class, date, semester, and assignment number on each assignment. Consider framing the situation in a systems context and defining the boundaries.

- Assignment 1: Ecosystem Scientist Worldview (25 points)
- Assignment 2: Cards (25 points)
- Assignment 4: Ecosystem study – observation, hypothesis, experimental design, and data interpretation (50 points)

- **Weekly Reflections – 50 points**

All weekly reflections will be submitted via canvas (10 points each). Each week, you will be asked to write a 3-sentence reflection on the concepts we cover during that week. The goal is to give you an opportunity to reflect on your own learning and progress throughout the course. Consider the following questions when writing up your weekly reflections (you do not need to answer all each week; you are also not limited to writing on only these topics):

- What was the most important/interesting thing you learned this week?
- Do you have any questions or confusions about the course material for the week?
- How do the concepts we covered this week relate to your other courses or experiences?

- **Final Project Portfolio - 100 points**

The final project portfolio will be submitted via canvas.

Final Project Portfolio Rubric

- Table of contents (5 points)
- Organization/ Neatness (10 points) - How well is it put together? don't be sloppy, take pride
- Material/Content – Revised: Observation and Hypotheses (20 points), Experimental Design (20 points), Data Interpretation (20 points)
- Narrative/Reflection (25 points) – Write a course reflection in which you consider your weekly reflections throughout the course and discuss what you have learned during the course. Consider how this course will inform your continued education in ecosystem science and sustainability. Please compile and include your weekly reflections (5 points) and include a course reflection (20 points).

- **Final Exam - 50 points**

In class, comprehensive, written exam

*Late Assignment Policy*

Late assignments will receive a 25% penalty and can be submitted up to one week after the deadline.

## Course Decorum

Please turn off or mute cellular phones and other mobile devices and put them away. In class mobile device use, including texting is disruptive. If you are expecting an urgent call, please put your device on vibrate and leave the classroom to answer or respond to the call or message.

## Academic Integrity

This course will adhere to the Academic Integrity Policy of the Colorado State University General Catalog and the Student Conduct Code. For more information, see the TILT website:

<http://tilt.colostate.edu/integrity>. For project, write-ups, and examinations, *a student shall not have given, received, or used any unauthorized assistance, and a student shall not give, receive, or use any unauthorized assistance*. Academic integrity also refers to citing references properly. It is assumed that the students may be communicating with one another while working on the assignments. While each student will submit their own work, discussions related to methodology are acceptable, when necessary.

Instructors shall follow the following procedures when they feel academic misconduct has occurred:

- If a course instructor has evidence that a student has engaged in an act of academic misconduct in his or her course, prior to assigning any academic penalty, the course instructor shall notify the student of the concern and make an appointment with the student to discuss the concern. The student shall be given the opportunity to give his or her position on the matter. After being given this opportunity, if the student admits to engaging in academic misconduct, or if the course instructor judges that the preponderance of evidence supports the allegation of academic misconduct, the course instructor may then assign an academic penalty. The course instructor may refer the case to the Office of Conflict Resolution and Student Conduct Services for a Hearing before deciding on a penalty. The course instructor shall notify the student in writing of the infraction and the academic penalty to be imposed. A copy of this notification shall be sent to the Office of Conflict Resolution and Student Conduct Services. Examples of academic penalties include assigning a reduced grade for the work, assigning a failing grade in the course, removing the Repeat/Delete option for that course, or other lesser penalty as the course instructor deems appropriate.
- If, after making reasonable efforts, the course instructor is unable to contact the student or is unable to collect all relevant evidence before final course grades are assigned, he or she shall assign an interim grade of Incomplete and notify the student in writing of the reason for this action.
- If evidence of academic misconduct is discovered after the final course grades have been submitted, the course instructor shall follow the above procedure in properly notifying the student and providing an opportunity for the student to give his or her position on the matter before making a decision about any academic penalty. The course instructor must notify the student in writing of the infraction and any academic penalty subsequently imposed. A copy of this notification shall be sent to the Office of Conflict Resolution and Student Conduct Services.
- If the course instructor so desires, he or she may request that the Office of Conflict Resolution and Student Conduct Services conduct a Hearing to determine whether additional disciplinary action should be taken by the University, or if the offense warrants the addition of the "AM" (Academic Misconduct) notation to the student's transcript.