Design Thinking and Field Geology
Course Incomes and Course Outcomes

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TEAMWORK
A FEW HARMLESS FLAKES WORKING TOGETHER CAN UNLEASH AN AVALANCHE OF DESTRUCTION.

SAFETY FIRST
APSC151
GEOL 104
GEOL 106

Geol/GeoE Majors
Geol Minors
? Certificates?
? Just plain interested?
Design Question / Problem 1 – Where are our incoming students in terms of knowledge and skills?
Design Problem 2 - There is just too much stuff in this course, (and evaluation based on many items is distracting the core messages)
Personas
Scenarios
Empathy Map

**Design Thinking 101**

- **Explore**
  - Test: Return to your users for feedback.
  - prototype: Build real, tactile representations for a range of your ideas.
- **Define**
  - Define: Combine all your research and observe where your users’ problems exist.
- **Empathize**
  - Empathize: Conduct research to develop an understanding of your users.
- **Ideate**
  - Ideate: Generate a range of crazy, creative ideas.
- **Materialize**
  - Materialize: Put the vision into effect.
TASKS
What tasks are users trying to complete? What questions do they need answered?

FEELINGS
How is the user feeling about the experience? What really matters to them?

INFLUENCES
What people, things or places may influence how the user acts?

PAIN POINTS
What pain points might the user be experiencing that they hope to overcome?

OVERALL GOAL
What is the user's ultimate goal? What are they trying to achieve?
7 detailed interviews across 4 ‘feed’ courses
1 student who took ‘old’ version of course

1. WHAT are we empathizing with?
   - Who is the person we want to understand?
   - What is the situation they are in?
   - What is their role in the situation?

2. GOAL
   - What do they need to do differently?
   - What decision(s) do they need to make?

3. THINK and FEEL?
   - What do they think and feel?
   - What are their thoughts, feelings, and anxieties?

4. WHAT do they SEE?
   - What have we seen?
   - What can we imagine them seeing?

5. WHAT do they SAY?
   - What have we heard?
   - What can we imagine them saying?

6. WHAT do they DO?
   - What do they do today?
   - What behavior have we observed?

7. PAINS
   - What are their fears, frustrations, and anxieties?
   - What are they worried about?

8. GAINS
   - What are their thoughts and feelings that motivate their behavior?
7 detailed interviews across 4 ‘feed’ courses
1 student who took ‘old’ version of course

Everyone feels they need more mineral-rock practice

Everyone struggles with thinking spatially

Everyone wants randomly assigned groups (!)
There are known knowns. These are things we know that we know. There are known unknowns. That is to say, there are things that we know we don't know. But there are also unknown unknowns. There are things we don't know we don't know.

(Donald Rumsfeld)
Everyone feels they need more mineral-rock practice. Everyone struggles with thinking spatially. Everyone wants randomly assigned groups (!).

The emphasis on multiple choice examinations is focusing students on factoids and so they are weaker in broad conceptual understanding than we hoped.
Moving on to the journey - collaborative design with the students... how do we address your concerns?

**Identify Moments of Opportunity**

- Emotion
- Pain Point
- Moment of Truth

Where can you effect real change?
Just starting on the course journey map:

Focus on the first three weeks:
- bring people to common level
- share weaknesses, build core skills
- emphasize collaborative tutorials
  (case case case so flip flip flip...)

“We want to be tested in
the field, showing we can
do the stuff”

People want tutorial
materials in multiple formats
(virtual, real-with-labels,
real-hidden-labels, ...
APSC151

GEOL 104

GEOL 106

core language and skills

culture

0                   3                   6                    9              12

First field-based solo evaluation
(and exit for \(\frac{1}{4}\) course?)

Random groups are seeded – not so random!
Role for upper year students in mentoring?
What emotions do we want them to associate with this course, 5-10 years from now?

What do we hope the students say ‘YES’ to?