Interdisciplinary Teaching in and beyond Geoscience: Thinking outside the Box

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Interdisciplinary Teaching

- **Introductory Courses**
  - Unlimited opportunities to enhance relevance and take advantage of diversity
  - Recruiting tool!

- **Upper-level Courses**
  - Cross-course, cross-department, cross-institution
  - Research and publication opportunities for faculty and students
Intro Courses

- Introduce relevance through external topics to increase interest and participation
  - “News of the Day”
  - Students of varying majors can connect their interests and experiences in lab and in-class activities
- Inclusive topics:
  - Human Impacts on the environment
  - Resource exploration, exploitation and dependence
  - Natural Hazards
- Recruiting Tools
  - Identify geology careers, especially in non-geologic fields (i.e. Insurance, Construction, Land development, etc.)
  - Disciplinary demand for increased diversity!
Upper-level Geology

- Endless opportunities for collaborative teaching across disciplinary boundaries
  - The only limitation is lack of imagination!

- Opportunities
  - Cross-discipline activities and projects
  - Course development (blending courses)
    - May help streamline curriculum
    - Helps in recruitment and establishing relevance
  - Undergraduate Research
Cross-discipline Activities (In-course)

- Can enhance learning by creating connections from course to course
  - Reinforces previous concepts
  - Exposure to upcoming content

- Example 1:
  - Landslide correlation w/ stratigraphy
    - 300-level Geomorphology
    - Combines Sed/Strat and GIS (at least!)
    - GIS Indexing project → Landslide susceptibility using factor maps
Cross-discipline Activities (In-course)

- Can enhance learning by creating connections from course to course
  - Reinforces previous concepts
  - Exposure to upcoming content
- Example 2:
  - Rivers, Politics, and Change
    - 300-level Hydrology
    - Establishes relevance of discharge, lateral migration, human impacts, etc.
    - Lower Mississippi River meanders, Nile River and political/cultural divides
“Blended” Courses at CalU

- **Math and Computer Science**
  - MAT 400: Math Modeling
  - Geology students (often Math minors) are invited to use applications in geophysics, groundwater, flow modeling, etc. as their course project

- **Art in Science**
  - ART 130/BIO 130: Biological Illustration: Form and Function
  - Cross-listed, team-taught Fine Arts course

- **Research Topics in Chemistry**
  - CHE 491/492: Chemistry Research I & II
  - Chem majors (dual w/ Geology) and minors typically select Geochemical topics and are co-advised by Geology faculty
Undergraduate Research

- In-course Research
  - Leverage students’ individual interests for course projects
  - Allows course to be more organic
    - Less time in development, more time in problem-solving and assessment
  - Potential for growth into…
- Extra-curricular Research
Example at CalU: Watershed Evaluation

- **EAS 448**
  - Writing-intensive capstone; lots of pre-requisites
  - Spring ‘14: 22 students (mostly Seniors)

- **Semester-long project**
  - Students have free reign to select research, but topic must be approved
    - Helps link non-friend students to collaborate based on interest rather than social status

- **4 “Topical Groups”**
  - Included leader, secretary, scheduler
  - Geochemistry, Geomorphology, Flow (Hydrology), and Soils
Undergraduate Research

- **In-course Research**
  - Leverage students’ individual interests for course projects
  - Allows course to be more organic
    - Less time in development, more time in problem-solving and assessment
  - Potential for growth into...

- **Extra-curricular Research**
  - Allows you to be more selective
  - Promotes collaboration with other faculty within and without your dept.
  - May lead to evolution and augmentation of your own research and increase productivity
Extra-curricular Research

A few of Kyle’s examples:


Other examples:


Questions, Please!