GEO 597: Grad Research Methods (aka, the 2 credit version of Research Workshop)

Instructor
Andrew Wilcox
CHCB 357
Office hours: by appointment (please email)
andrew.wilcox@umontana.edu

Zoom info:
We will start the semester by Zoom. We will potentially move toward a blended format, where some of us are face-to-face. As a graduate class, I ask that you’re your video on and help us to maintain as interactive a format as possible.
https://umontana.zoom.us/j/95756167716?pwd=SERSMlg2UTU3L3NJM3RsMUNYRFk2QT09
Meeting ID: 957 5616 7716 ; Passcode: 567803

Prerequisites
This course requires graduate standing and an active research project.

Summary
This is a graduate-level seminar intended to discuss and troubleshoot research challenges. Students will bring current research challenges for consideration by the whole group. Challenges will be dependent on individual research programs and may range from proposal development to methodological questions, data analysis, data interpretation, manuscript development, and preparation for professional presentations.

Expectations
Course grade will be determined by class participation and a final project demonstrating how the workshop discussions were used to augment or modify ongoing research.

Learning outcomes

- Critical thinking: Students will be able to evaluate a scientific problem.
- Scientific reasoning: Students will be able to outline a pathway to overcoming a research barrier.
- Constructive collaborative discussion: Students will be able to constructively collaborate on solving specific research challenges.
- Overview of data collection methods: Students will be familiar with a wide range of data collection strategies used in geosciences.
- Overview of data reduction methods: Students will be familiar with a wide range of data reduction strategies used in geosciences.
- Principles of scientific writing: Students will be able to write in standard scientific style suitable for proposal and manuscript development.

Topics
Basic topics to be covered will depend on student interests. Topics could include but are not limited to (also see list at end):

- Statistical methods
- Scientific writing
• Scientific speaking and presentations
• Numerical simulation and modeling
• Advances in AI and ML for geosciences
• Critical reading of current literature
• Uncertainty and confidence
• Interpretation of results

Schedule
Please sign up for one week, before April, in which we’ll “workshop” a research challenge that you identify. If multiple people identify the same research challenge, we can combine. During the last few weeks of the course we will revisit research challenges we’ve previously addressed in an effort to evaluate progress and move toward coming full circle.

Jan. 11 Course intro
Jan. 18 MLK no classes
Jan. 25
Feb. 1
Feb. 8
Feb. 15 Presidents day no classes
Feb. 22
March 1
March 8
March 15
March 22
March 29
April 5
April 12
April 19
April 26 (finals week but we’ll meet)

Here is a list of topics grad students posted in Boxnote at the start of the academic year, that they’d like to see addressed.

• Professional Introductions
• Code switching: science, public, faculty, peers, etc
• Imposter syndrome in the sciences and working through science anxiety
• Integration: roots based vs. bridge based (I can spearhead this if no one knows what I am talking about)
• Reaching out to undergraduates in the department
• Different modes of science: western science, eastern science, and Indigenous science.
• Building a science resume
• Health insurance and Graduate school
• Advocating for yourself with advisors
• Research discussions
• Presentation and poster practice
• Problem solving in research
• Debugging code (matlab, python, etc)
• Effective scientific figures: best practices, coding, share figures and critique.