GEL 217 Topics in Geophysics: Back-of-the-Envelope Physics (3 units)

Winter Quarter 2024
MWF 10:00-10:50 in Earth and Physics Sciences Room 1119 (Moores Conference Room)

Professor Sarah T Stewart

- Office hour: Friday 2:10-3:00 pm
- The best way to reach me outside of class is to send an email in canvas

This class focuses on developing the skill of estimation and building physical intuition by using a variety of simplifying strategies. The class will have a flipped classroom format. Students must prepare for each meeting by reading the textbook and doing the assigned problems. The class in-person meetings will focus on individual and group-based estimation activities to develop quick estimation skills.

Required Textbook: The Art of Insight in Science and Engineering: Mastering Complexity by Sanjoy Mahajan

- Open textbook PDF: https://ocw.mit.edu/courses/res-6-011-the-art-of-insight-in-science-and-engineering-mastering-complexity-fall-2014/
- Hard copy available from Amazon: https://www.amazon.com/gp/product/0262526549

Other good resources for practicing order of magnitude problems with a wide variety of topics. We will draw problems from these resources for our in-class activities.

- Back-of-the-Envelope Physics by Clifford Swartz
- Guesstimation: Solving the World's Problems on the Back of a Cocktail Napkin by Lawrence Weinstein and John Adam
- Guesstimation 2.0: Solving Today's Problems on the Back of a Napkin by Lawrence Weinstein and Patricia Edwards

Grading structure

- Weekly problems to prepare for class (30%)
- In-class activities will be turned in (50%)
- Final project (20%)