251A Intro. to PDEs Spring 2024

Time and Place: MWF 10am at TBA

We will focus on Energy method. Topics to be discussed include:

- Existence of energy minimizer, Euler-Lagrange Equation.
- Convex Duality
- Constraints
- BV spaces and geometric variational problems, minimal surfaces.
- Evolution problems: gradient flows. Wasserstein space, minimizing movements.

We will assume that students are familiar with basic measure theory (245AB). We will discuss any other necessary preliminary material as we proceed.

There will be 3-4 sets of homework problems.

References will include:

- Evans, Partial Differential Equations.
- Santambrogio, A course in the calculus of variations.
- Struwe, Variational Method.
- Evans and Gariepy, Measure theory and Fine properties of Functions.
- Connor, Lecture note on minimal surfaces.
- Santambrogio, Gradient flows: an Overview, Bulletin of Mathematical Sciences 7, 87-104 (2017).