Heegaard-Floer flow chart for topics course at Brandeis University, circa January 2010.

Heegaard-Floer homology: \( HF_\infty, HF^+, HF^-, HF^\wedge \)

- Morse Theory
- Heegaard diagrams
- \( \text{Spin}^c \) structures
- Euler structures
- Lagrangian Floer theory
- Contact structures; Tightness
- Knot surgery
- Property P
- Lens space surgeries
- Genus bounds
- Thurston norm
- Fibrations
- Surgery techniques
- Absolute \( Q \)-gradings
- Intersection forms; \( d \)-invariant
- Homology cobordisms
- \( \text{HFS--Sutured Heegaard-Floer homology} \)
- Knot Genus bounds
- Fibrations
- \( \tau \)-invariant
- \( \text{HFK Knot homology} \)
- Knot concordance
- 4-ball genus
- \( \text{Bordered Heegaard-Floer homology} \)
- 3-manifolds with boundary
- Gluing theorems
- Calculations
- \( \text{Combinatorial HF, HFK theories} \)
- Calculations --someday!
- Multi-pointed Heegaard diagrams
- Surgery exact sequence
  \( HF^\bullet (Y_1) \rightarrow HF^\bullet (Y_0) \rightarrow HF^\bullet (Y) \)
- Cobordism maps
- 4-manifold invariants
- Symplectic 4-manifolds
- Dim=4 Genus bounds
- \( \text{Calculations} \)
- \( \text{HFS--Sutured Heegaard-Floer homology} \)