Grading: Combination of a term paper and an oral presentation.
The course aims at being a fairly self contained introduction to some advanced aspects of condensed matter physics. Methods of quantum field theory will be introduced as needed.

• Critical Phenomena and the Renormalization Group
  – Phenomenology of critical phenomena
  – Renormalization group: Kadanoff picture
  – Renormalization group: $\epsilon$ expansion
  – Kosterlitz Thouless transition
  – Kondo problem
  – Dynamical critical phenomena

• Interacting Fermions
  – Grassman integrals
  – Fermi Liquid theory
  – Coloumb interactions
  – Disorder and localization

To be continued in 242-B

• Quantum Magnetism

• Superfluidity and Superconductivity

• Topological Phases of Matter