Phy 7097: Topics on Transport in disordered systems (Muttalib):

Outline:

- Choice of topics: Recent UF experiments (1 lecture, Refs 1 and 2)
- Overview: Kubo formula, quantum corrections (2 lectures; Ref. 3).
- Transport in 2 dimensional ferromagnetic films: theory (4 lectures, Ref 4).
- Transport in thin Fe films: experiment vs. theory (1 lecture; Ref 1).
- Transport in thin Gd films: experiment vs. theory (1 lecture; Ref. 2).

References:

1. P. Mitra et al, ``Weak localization correction to the anomalous Hall effect in polycrystalline Fe films" Phys. Rev Lett. 97, 046804 (2007).
2. R. Misra et al, ``Spin-wave mediated quantum corrections to the conductivity in thin ferromagnetic gadolinium films", cond-mat/arXiv:0808.4103 (2008).
3. A.A. Abrikosov, L.P. Gorkov and I.E. Dzyaloshinski, ``Methods of Quantum Field Theory in Statistical Physics'', Dover (1975); P.A. Lee and T.V. Ramakrishnan, Rev. Mod. Phys. 57, 287 (1985); B.L, Altshuler and A.G. Aronov in ``Electron-electron interaction in disordered conductors'', Eds A.L. Efros and M. Pollak; Elsevier (1985).
4. P. Wölfle and K.A. Muttalib, ``Anomalous Hall effect in ferromagnetic disordered metals", Ann. Phys. (Leipzig) 15, 519 (2006); K. A. Muttalib and P. Wölfle, ``Disorder and temperature dependence of the Anomalous Hall Effect in thin ferromagnetic films: Microscopic model", Phys. Rev. B 76, 214415 (2007).