Course Information Sheet for Physics 560A: Condensed Matter Physics

Quantum theory of solids; second-quantization; bosons and fermions; broken symmetry; band theory; transport theory and nonequilibrium Green's functions; magnetism; superconductivity.

Each student must investigate an advanced topic in condensed-matter physics to be agreed upon with the instructor, and present their findings either in a 20-minute oral presentation or a 10-page term paper.

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Office hours: W 1:30–3:30pm

Lectures: MWF, 9–9:50am, PAS 416

Grading:

The course is graded on a curve, based on the cumulative score. The minimum cumulative percentages necessary to obtain the following letter grades will be roughly: $A \geq 80\%$, $B \geq 65\%$, $C \geq 50\%$, $D \geq 40\%$. The cumulative score will be determined as follows:

Homework: 0% if no grader (solutions provided)
Midterm (October 7): 30%
Project (20-min. oral presentations Dec. 2, 5): 20%
Final Exam (Take-home exam Dec. 7; due 4pm Dec. 12): 50%

Disabilities:

Students requiring accomodation in testing or note taking must notify the instructor and provide a letter from the Disability Resource Center by August 31, 2011.

Required Text:

G. D. Mahan, "Condensed Matter in a Nutshell" (Princeton University Press, 2011)

Additional suggested references

G. D. Mahan, "Many-Particle Physics"

M. Marder, "Condensed Matter Physics" (Wiley, 2000)

C. Kittel, "Quantum Theory of Solids"

H. Haug and A.-P. Jauho, "Quantum Kinetics in Transport and Optics of Semiconductors" (Springer, 1996).

J. M. Ziman, "Principles of the Theory of Solids" (2nd Ed., Cambridge University Press, 1972)

N. W. Ashcroft and N. D. Mermin, "Solid State Physics" (Saunders College Publishers, 1976)

P. M. Chaikin and T. C. Lubensky, "Principles of condensed matter physics" (Cambridge, 1995)