

# Physics 232

## Condensed Matter Physics

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Location: 231 ISB  
Times: Mondays and Wednesdays, 11:00–12:45 am.

This course description and other course materials will also be available on my web site at

<http://apyoung.com/232>

### TOPICS

This course on condensed matter physics will cover three areas:

- **magnetism,**
- **optical properties,**
- **superconductivity.**

They have been chosen because of their intrinsic interest and because they are both areas of active research.

### BOOKS

No one book covers all the material. General books on solid state physics such as

*Condensed Matter Physics* by **M. Mardar**

*Solid State Physics* by **N. Ashcroft** and **N. D. Mermin**

*Introduction to Solid State Physics* by **C. Kittel** (more elementary)

will be useful. The concise book

*Principles of the Theory of Solids* by **J. M. Ziman** is also useful.

Other more specialized books will also be used, for example:

*Lectures on The Theory of Magnetism* by **R. J. Elliott**

*Quantum Theory of Magnetism* by **R. M. White**

*Electrodynamics of Solids* by **Martin Dressel** and **George Grüner**

*Quantum Theory of Solids* by **C. Kittel**

*Theory of Interacting Fermi Liquids, Vol. 1* by **D. Pines** and **P. Nozières**

*Theory of Superconductivity* by **J. R. Schrieffer**

*Introduction to Superconductivity* by **M. Tinkham**

*Theory of Superconductivity* by **G. Rickayzen**

*Superconductivity of Metals and Alloys* by **P. G. de Gennes**

*Superconductivity* edited by **R. D. Parks**, Vols I and II.

These are, or soon will be, on reserve in the library.

## REQUIREMENTS

This course will require:

- Quantum mechanics, preferably at graduate level
- Statistical mechanics, at graduate or advanced undergraduate level
- Basic atomic physics
- Knowledge of basic condensed matter physics, e.g. Physics 231, would also be helpful.

## GRADES

The grades for the course will be decided on the basis of homework, 50%, and a final exam, 50%. To pass the course you must receive a satisfactory score in **both** parts.