

UMCS  
Condensed Matter Physics  
Summer 2019/2020

**Instructor Information:**

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**Course Web Page:** See [this](#) page.

**Course Content:** The (potential) topics of this course include:

- Crystal structure
  - Lattices
  - Bragg's law
- Crystal dynamics - sound and phonons - heat capacity
- Free electron gas
- Electrical and thermal conductivity - Wiedemann-Franz law
- Nearly-free electron theory
- Classification of metals, insulators and semiconductors
- Tight-binding approach
- Band structure and effective mass
- Semiconductors
- Metals
- Magnetic order

**Grading:** The course grade will be based on participation in the classes and a final exam.

**Objectives:** To have an overview of the foundations of solid state physics, and an understanding of the properties of electrons in periodic crystal lattices.

**Prerequisites:** Quantum Mechanics, Calculus.