# Module: Specialization I

**Module No.:** physics610

# Course: Condensed Matter Physics I

**Course No.:**

| Category | Type | Language | Teaching hours | CP | Semester |
|---|---|---|---|---|---|
| Elective | Lecture with exercises | English | 3+1 | 6 | WT |

**Requirements:**

**Preparation:**
Basic knowledge in condensed matter physics and quantum mechanics

**Form of Testing and Examination:**
Oral or written examination

**Length of Course:**
2 semesters

**Aims of the Course:**
Comprehensive introduction to the basic principles of solid state physics and to some experimental methods. Examples of current research will be discussed.

**Contents of the Course:**
The entire course (Condensed Matter I & II, given in 2 semesters) covers the following topics:
Crystal structure and binding
Reciprocal space
Lattice dynamics and thermal properties
Electronic structure (free-electron gas, Fermi surface, band structure)
Semiconductors and metals
Transport properties
Dielectric function and screening
Superconductivity
Magnetism

**Recommended Literature:**
Skriptum (available during the course)
Ashcroft/Mermin: Solid State Physics
Kittel: Introduction to Solid State Physics
Ibach/Lüth: Festkörperphysik