Module: Elective Advanced Lectures: BCGS Courses

Module No.: physics70d

Course: Experimental methods in condensed matter physics (E/A)

Course No.:

Category	Type	Language	Teaching hours	CP	Semester
Elective	Lecture	English	2	3	WT

Requirements for Participation:

Preparation:
Basic knowledge in condensed matter physics

Form of Testing and Examination:
Oral examination

Length of Course:
1 semester

Aims of the Course:
Understanding of experimental concepts in condensed matter science
Knowledge of basic fields and important applications

Contents of the Course:
The lecture introduces to modern experimental approaches in solid state physics. Basic concepts are illustrated with examples of physical problems investigated employing different methods.
Topics covered are
Introduction on sample preparation
X-ray powder diffraction
Specific heat, Thermal expansion
Magnetization and magnetic susceptibility
DC-Transport
Dielectric spectroscopy
Photo-emission spectroscopy
Inelastic scattering (neutrons, light)
THz spectroscopy / Optical spectroscopy
Scanning probe microscopy/spectroscopy (AFM, STM)

Recommended Literature:
Skriptum (available during the course)
Bergmann/Schäfer, Experimentalphysik (Band 6: Festkörper)
Ibach/Lüth, Festkörperphysik
Ashcroft/Mermin, solid state physics