Modules:

physics700 **Elective Advanced Lectures**
physics710 **Experimental Physics**
physics720 **Applied Physics**

Course: Superconductivity (E/A)

Course No.:

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

Requirements:

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 the fundamental aspects of superconductivity.

Contents of the Course:
The lecture provides an overview of the fundamental aspects of superconductivity, theoretical description and technological applications, including the following topics:

Basic experimental facts and critical parameters
Phenomenological description: London equations
Ginzburg-Landau theory
Magnetic flux quantization
Type I and type II superconductors, characteristic length scales, vortices
Microscopic description: BSC theory
Electron-phonon interaction, Cooper pairs
Josephson effects
Applications of superconductivity in science, transport, and medicine
Brief introduction to unconventional superconductivity with recent examples

Recommended Literature:
J. F. Annett: Superconductivity, Superfluids and Condensates (2004)
M. Tinkham: Introduction to Superconductivity (1996)
V. V. Schmidt: The Physics of Superconductors (1997)
J. R. Waldram: Superconductivity of Metals and Cuprates (1996)
D. R. Tilley and J. Tilley: Superfluidity and Superconductivity (1990)