

Solid State Physics

For the 1st year MSc students (Fall Semester of 2017/18 Academic Year)

List of subjects for oral exam

Symmetries in Condensed Matter

Quantum mechanical description of phonons

Experimental studies of phonons

Magnetic interactions, ferromagnets, antiferromagnets, magnons, 1d, 2d magnetic structures

Bloch electrons

Bandstructure calculations: quasi free electron model & tight-binding model

Semiconductors

Semiclassical approximation

Electrons in strong magnetic field: Landau levels, cyclotron resonance

Electron-phonon interaction

Transport properties

Optical properties

Ginzburg-Landau theory of superconductivity

Josephson effect

BCS theory