Level: master

Course title: Numerical methods in statistical physics

Status: obligatory

ECTS: 7

Requirements: Theory of phase transitions

Learning objectives

Providing basic knowledge in numerical methods, which are very efficient in practical application in statistical physics and condensed matter physics.

Learning outcomes

After taking the course, students should have developed:

General abilities: basic knowledge of this field, following the literature, analysis of various solutions and the choice of the most adequate solution, application in practice and other subjects. **Subject-specific abilities:** getting familiar with numerical models and solving methods. Choosing the most efficient method for given problem and physical model. Solving current problems in condensed matter physics.

Syllabus

Theoretical instruction

Concept of random variable and distribution function. Generator of random numbers and its testing. Models in statistical physics, "simple sampling", "biased sampling" and "importance sampling". Random walks on lattice. Boundary conditions. Simulation of magnetic materials. Ising model. Heisenberg model. Border effects.

Practical instruction

Problem solving sessions.

Weekly teaching load				Other:
Lectures:	Exercises:	Other forms of	Student research:	
3	3	teaching: 0		