

Level: bachelor				
Course title: Statistical Physics				
Status: obligatory				
ECTS: 4				
Requirements: Modern Theoretical Physics				
Learning objectives Acquiring the basic knowledge of the fundamental concepts, methods and laws of thermodynamics and statistical physics.				
Learning outcomes After taking the course, the student 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: application of methods of statistical physics in the analysis of simple model systems (condensed matter systems, plasma, ionized gases). Knowledge acquired in this course presents the necessary base for the student to follow the more advanced courses (theory of magnetism, liquid crystals, superconductivity, phase transitions etc.).				
Syllabus <i>Theoretical instruction</i> The basic concepts and laws of equilibrium phenomenological thermodynamics. Application to some thermodynamic systems (magnets, superconductors, ferroelectrics). Thermodynamic potentials and Legendre transformations. The thermodynamic equilibrium conditions. Maxwell relations, thermodynamic response functions, stability conditions. Phase transitions of first and second order. Critical phenomena and critical indices; application of the mean-field theory to simple systems. Introduction to the theory of phase transitions: critical behaviour of Heisenberg model, mean-field approximation. Ising model. Landau's theory of phase transitions. <i>Practical instruction</i> Exercises.				
Weekly teaching load				Other:
Lectures: 2	Exercises: 2	Other forms of teaching: 0	Student research:	