Program	Level of studies		First cycle	
	Program name		**Physics**	
Course name	**STATISTICAL PHYSICS**			
Course ID	Semester	Course status	ECTS credits	L+E
PTH6611	**VI**	**MANDATORY**	**6**	**3+2**
Lecturer	**Prof. dr. Aner Čerkić**			
Aims and intended learning outcomes	Aim of the course is to introduce students to statistical physics by lectures and exercises. Expected outcomes: Adopting the basic ideas and concepts of equilibrium statistical physics. Mastering the mathematical apparatus of classical and quantum statistical physics. Getting acquainted with the applications of equilibrium statistical physics.			

Course content

Goal and methods of the statistical physics
Elements of combinatorics and probability calculus.
Classical statistical physics
Microstates and macrostates of a system. Phase space and phase trajectories. Statistical ensemble. Distribution function. Liouville equation. Gibbs definition of entropy. Gibbs equilibrium ensembles. Applications of the canonical ensemble.
Quantum statistical physics
Mathematical apparatus of quantum mechanics. Density matrix. Gibbs equilibrium ensembles. Statistical sum of the ideal gas and solids. Mie-Grüneisen equation of state for solids.
Ideal gas of quantum-mechanical microobjects
Fermi-Dirac and Bose-Einstein statistics. Boltzmann distribution. Fully degenerate Fermi gas. Degenerate Fermi gas. Degenerate Bose gas – Bose-Einstein condensation. Weakly degenerate Bose gas. Weakly degenerate Fermi gas.
Application of quantum statistical physics
Photons. Phonons. Electron gas in metals.

Student workload (hours)		Grading	
Lectures and Exercises	75	Assessment method	Points
Exam preparation	60		
Assignments	10		
Other	5	Partial exam	50
Total	150	Final exam	50
		Total	100

Literature

Mandatory literature:
1. A. Čerkić, S. Odžak i D. Hadžiahmetović, *Statistička fizika*, Univerzitetsko izdanje, Sarajevo, 2013.

Additional literature:
1. Đ. Mušicki, *Uvod u teorijsku fiziku II - Statistička fizika*, Izdavačko informativni centar studenata (ICS), ŠIP Srbija, Beograd, 1975.
2. L. D. Landau, E. M. Lifšic, *Teoretičeskaja fizika. Tom V* (1): *Statističeskaja fizika*, Nauka, Moskva, 1976. (ruski, engleski, bosanski)
3. B. S. Milić, S. M. Milošević, Lj. S. Dobrosavljević, *Zbirka zadataka iz teorijske fizike*: *Statistička fizika*, Naučna knjiga, Beograd, 1979.

Remarks