Study program	Level of studies		**Third cycle**	
	Title of the study program		**Doctoral studies in physics**	
Course title	**PERCOLATION THEORY**			
Course ID	Semester	Course status	ECTS credits	Teaching hours
PCM7041	**I /II**	**Elective**	**10**	**30**
Course aims and expected learning outcomes	The course aims to acquire knowledge and competencies in the percolation theory; introduce basic percolation models; determine the percolation threshold; introduce the random sequential adsorption model and its connection with percolation. Learning outcomes: * qualitatively and quantitatively explain percolation theory and explain different percolation models; * determine the percolation threshold in the classic percolation model; * explain and apply the random sequential adsorption model.			

COURSE CONTENT

Introduction to Percolation Theory. Types of percolation models - classical, explosive, invasion, bootstrap and correlated percolation. Exact solution for a 1D Bethe lattice. Cluster structure. Finite-size scaling. Application of percolation. The random sequential adsorption (RSA) model and its relation to percolation.

LITERATURE	ASSESSMENT OF LEARNING	
1. D. Stauffer, A. Aharony, Introduction to Percolation Theory, Taylor& Francis, London, 1992. 2. N.E. Cusak, The Physics of Structurally Disordered Matter, Adam Higler, Bristol, 1988. 3. A. Bunde, S.Havlin , Eds., Fractala and Disordered Systems, Springer, Berlin, 1996.	Assessment Method	Points
	Seminar paper	100
	Total	100

Remarks

In the seminar paper, theoretical knowledge from percolation theory will be applied to concrete results of Monte-Carlo simulations.