

Level : PhD				
Course title: Interactions of Cosmic Rays				
Status: elective				
ECTS: 15				
Requirements: Nuclear Instrumentation, Nuclear Physics				
Learning objectives Introducing students to the characteristics of cosmic radiation at the Earth's surface and interactions of cosmic rays with a medium.				
Learning outcomes Understanding the principles of interactions of cosmic rays with a medium and knowledge on application of cosmic-ray muons for imaging of different structures.				
Syllabus Production of secondary cosmic radiation in atmosphere. Components of cosmic radiation on the Earth's surface. Variations of flux of cosmic radiation. Low-energy photon ionizing radiation of cosmic origin. The energy and angular distribution of the muon component of cosmic radiation. Electromagnetic and nuclear processes in materials induced by cosmic radiation. The interaction of cosmic-ray muons. The interactions of cosmic-ray neutrons. Cosmogenic radionuclides. Detection of cosmic radiation. Coincident techniques for the detection of cosmic radiation. Cosmic-ray muons deep below the Earth's surface. Simulations of the interaction of cosmic radiation. Muon imaging techniques with applications.				
Weekly teaching load				Other:
Lectures: 6	Exercises:	Other forms of teaching:	Student research: 4	