Level: PhD

Course title: Radioactivity in nature

Status: elective

ECTS: **15**

Requirements: Modern experimental physics III, Nuclear Physics

Learning objectives

Teaching students about the origin and distribution of naturally occurring radioactive isotopes.

Learning outcomes

Students will become familiar with the origin and distribution of radioactivity in nature, as well as with the application of nuclear physics for exploration of natural radioactivity.

Syllabus

The origin of the elements. The origin of radioactive nuclei. Transformations in the radioactive series.

Balance. The natural radioactive elements. Cosmogenic radioisotopes. Anthropogenic radioisotopes.

Radioactive dating. Radioisotopes in the living environment. Regional and local variations.

Migration of radionuclides in nature. Radioisotopes in the lithosphere, hydrosphere, atmosphere. Chemical and biological effects of radiation. Radioisotopes in ecosystems. Contamination. Spatial and temporal development. Transmission of radioisotopes through the food chain.

Measurement of radioactivity in the samples from the environment. Counting and spectrometric techniques. Measurement of low activity. The origin and reduction of background. Nuclear detectors for measurement of radioactivity in the environment. The measurements in situ. Sampling and preparation of samples from the environment. Processing, analysis and presentation of results.

Weekly teaching load				Other:
Lectures: 4	Exercises:	Other forms of teaching:	Student research: 6	