Level: bachelor

Course title: Nuclear physics

Status: elective

ECTS: 7

Requirements: Contemporary experimental physics III

Learning objectives

To introduce students to the properties of atomic nuclei, models of the atomic nuclei, types of radioactive decays and nuclear reactions.

Learning outcomes

To gain knowledge about the properties of atomic nuclei, models of the atomic nuclei, types of radioactive decays and nuclear reactions.

Syllabus

Models of the atomic nuclei (Fermi gas model, Shell model, Collective models, Unified models, Meson theory of the nuclear force). Electromagnetic moments of the nucleus (Magnetic dipole moment, Electric quadrupole moment, Higher electromagnetic models, Measurement of the multipole moments). The probability of radioactive decays (Alfa decay- tunnel effect, Beta decay - weak interaction, Electromagnetic transitions between nuclear levels). Alfa, beta and gamma spectroscopy.

Nuclear reactions (The kinematics of nuclear reactions, The probability of nuclear reactions. Fission and fusion).

Weekly teaching load				Other:
Lectures: 3	Exercises: 1	Other forms of teaching: 3	Student research:	