Course Unit Descriptor

Study Programme: Physics		
Course Unit Title: Nuclear physics		
Course Unit Code: F18NF		
Name of Lecturer(s): Full Professor Miodrag Krmar		
Type and Level of Studies: Bachelor Academic Degree		
Course Status (compulsory/elective): Compulsory		
Semester (winter/summer): Summer		
Language of instruction: English		
Mode of course unit delivery (face-to-face/distance learning): Face-to-face		
Number of ECTS Allocated: 7		
Prerequisites: Fundamentals of Nuclear Physics		
Course Aims: To introduce students with the basic characteristics of the atomic nucleus, the interactions between nucleons, some of nuclear models, types of radioactive decay, and nuclear reactions.		
Learning Outcomes: General Skills: Knowledge of the properties of the atomic nucleus, nuclear interactions, nuclear models, types of radioactive decay and nuclear reactions. Specific Competencies: Adopting practical knowledge in the field of nuclear physics, which will qualify student to continue education in the field of high energy physics and elementary particles, as well as gain possibility to introduce students to some practical disciplines based on the application of nuclear physics in medicine, energy, industry, etc.		
Syllabus: *Theory* Basic nuclear properties, mass, binding energy, electromagnetic moments of the nucleus (magnetic dipole moment, electrical quadrupole moment, multipolar moments of higher order, measurements of multipole moments.) Nature of nuclear forces, nucleon - nucleon interaction, meson theory of nuclear power. Nuclear models (Fermi gas model, shell model, collective models, radioactive decay probability (alpha decay - tunnel effect, beta decay – week interaction, electromagnetic transitions. Alpha, beta, and gamma spectroscopy). Nuclear reactions. *Practice* Experimental and computational exercises.		
Required Reading: 1. W.E.Burcham, Nuclear Physics An Introduction, Longmans Green and Co Ltd, London 1967 2. K.S.Krane, Introductory Nuclear Physics, John Willey and Sons, 1987 3. K.N. Mukhin, Physics of Atomic Nucleus, Mir Publishers, Moscow, 1987		
Weekly Contact Hours:	**Lectures:** 3	**Practical work:** 3
Teaching Methods: Lectures, seminars and practical work.		
Knowledge Assessment (maximum of 100 points):		

Pre-exam obligations	points	**Final exam**	points
Active class participation	5	written exam	20
Practical work	5	oral exam	50
Preliminary exam(s)	-	…….	
Seminar(s)	20		
The methods of knowledge assessment may differ; the table presents only some of the options: written exam, oral exam, project presentation, seminars, etc.			