Faculty of Science and Mathematics / PHYSICS / NUCLEAR PHYSICS

Course:	NUCLEAR PHYSICS								
Course ID	Course status	Semester	ECTS credits	Lessons (Lessons+Exer cises+Laboratory)					
5732	Mandatory	1	6	3+2+0					
Programs	PHYSICS								
Prerequisites									
Aims	This course is aimed to complete general education of physicists, introducing students to the nuclear transformations and nuclear reactions, and developing their research abilities and skills to apply knowledge in practice.								
Learning outcomes									
Lecturer / Teaching assistant	Nevenka Antović / Marija Daković								
Methodology	Lectures, exercises, homework, seminar, consultations.								
Plan and program of work									
Preparing week	Preparation and registration of the semester								
I week lectures	Radioactive nuclear transformations: Alpha decay – origin of alpha emitters, energy of alpha decay, theory, conservation laws.								
I week exercises									
II week lectures	Beta decay – theory, parity non-conservation.								
II week exercises									
III week lectures	Gamma decay – gamma transition probability, selection rules, internal conversion, nuclear isomerism.								
III week exercises									
IV week lectures	General laws governing nuclear reactions: classification, conservation laws, cross section.								
IV week exercises									
V week lectures	Interaction of neutrons with nuclei: Types of interaction. Slowing down of neutrons.								
V week exercises									
VI week lectures	Midterm exam – I								
VI week exercises									
VII week lectures	The Bohr theory of nuclear reaction.								
VII week exercises									
VIII week lectures	Scattering of fast neutrons. Basics of the nuclear optical model.								
VIII week exercises									
IX week lectures	Nuclear fission – elementary theory. Utilization of fission energy.								
IX week exercises									
X week lectures	Fission cross section. Chain reaction. Natural nuclear reactor. Fission asymmetry.								
X week exercises									
XI week lectures	Midterm exam – II								
XI week exercises									
XII week lectures	Nuclear reactions induced by light charged particles.								
XII week exercises									
XIII week lectures	Direct interaction reactions.								
XIII week exercises									
XIV week lectures	Nuclear reactions induced by gamma-quanta.								
XIV week exercises									
XV week lectures	Thermonuclear reactions								

ECTS catalog with learning outcomes University of Montenegro

XV week exe	ercises								
Student wo	orkload	6 x 40/30 = 8 hours per week. Total: 6 x 30 = 180 hours.							
Per week		Per semester							
6 credits x 40/30=8 hours and 0 minuts 3 sat(a) theoretical classes 0 sat(a) practical classes 2 excercises 3 hour(s) i 0 minuts of independent work, including consultations			Classes and final exam: 8 hour(s) i 0 minuts x 16 =128 hour(s) i 0 minuts Necessary preparation before the beginning of the semester (administration, registration, certification): 8 hour(s) i 0 minuts x 2 =16 hour(s) i 0 minuts Total workload for the subject: 6 x 30=180 hour(s) Additional work for exam preparation in the preparing exam period, including taking the remedial exam from 0 to 30 hours (remaining time from the first two items to the total load for the item) 36 hour(s) i 0 minuts Workload structure: 128 hour(s) i 0 minuts (cources), 16 hour(s) i 0 minuts (preparation), 36 hour(s) i 0 minuts (additional work)						
Student obligations			Regular attendance, homework, seminar, two midterm exams and final exam.						
Consultations			As agreed with lecturer and teaching assistant.						
Literature			K. N. Mukhin, Experimental Nuclear Physics. Vol I, Mir Publishers, Moscow, 1987; W. E. Burcham, Nuclear Physics, Naučna knjiga, Belgrade, 1974 (in Serbian); D. Krpić, I. Aničin, I. Savić, Problems in Nuclear Physics, University of Belgrade, 1996 (in Serb						
Examination methods			Regular attendance: 4 points; homework: 2 x 2 points (4 points); seminar: 12 points; midterms: 2 x 15 points (30 points); final exam: 50 points. Grades (points): F (below 50), E (51-59), D (60-69), C (70-79), B (80-89), A (90-100).						
Special remarks									
Comment									
Grade:	F		E	D	С	В	A		
Number of points	less than 50 points		greater than or equal to 50 points and less than 60 points	greater than or equal to 60 points and less than 70 points	greater than or equal to 70 points and less than 80 points	greater than or equal to 80 points and less than 90 points	greater than or equal to 90 points		