Табела 5.1 Спецификација предмета на студијском програму докторских студија

Назив предмета: Ultrabrzi Fenomeni		
Наставник или наставници: Dr. Predrag Ranitovic		
Статус предмета: Izborni		
Број ЕСПБ:		
Услов: Atomska Fizika, Optička Fizika, Engleski Jezik		
Циљ предмета **Upoznavanje studenata sa temom ultrabrzih lasera i njihovom primenom na ispitivanje i kontrolu dinamike elektrona u atomima i molekulima koja se dešava u vremenskom domenu tipičnom za dinamiku elektrona, od femto do attosekundnog nivoa.**		
Исход предмета **Student dobija priliku da se upozna sa modernim ekepsrimentalim tehnikama i teorijskim modelima koji opisuju ultrabrze procese dinamike elektrona koji se dešavaju u atomima, molekulima i materijalima.**		
Садржај предмета *Теоријска настава* 1: Generacija i primena ultrabzih laserskih pulseva i atosekundnih VUV, XUV i mekih X zraka. 2: Moderne ekperimentalne metode koje se koriste za praćenje i kontrolu dinamke elektrona. Osnovni teorijski modeli koji se koriste za opisivanje ultrabzih elektronskih i photonskih pulseva. 3: Dinamika elektronskih i nuklearnih talasnih paketa i metodi koherentne kontrole u atomskoj i molekularnoj fizici i fizičkoj hemiji. 4: Specijalna poglavlja		
Препоручена литература Attosecond and Strong-Field Physics: Principles and Applications by C.D. Lin, et. al. Cambridge University Press. (2018) i reference.		
Број часова активне наставе	Теоријска настава:	Практична настава:
Методе извођења наставе Predavanja		
Оцена знања (максимални број поена 100)		
Domaći zadaci 50%, prezentacija odabrane teme na kraju semestra 25% i usmeni ispit 25%.		
*максимална дужна 1 страница А4 формата		

Table 5.1 Specification of subjects in the doctoral studies study program

Name of the subject: Ultrafast Phenomena		
Teacher(s): Dr. Predrag Ranitovic		
Status of the subject: by choice		
Number of ECIIБ points:		
Condition: Atomic Physics, Optical Physics		
Goal of the subject The focus of the course is on the introduction of ultrafast processes happening on femtosecond-to-attosecond (i.e. 10^{-15} s to 10^{-18} s) time- scales in small atoms and molecules and materials.		
Outcome of the subject This course presents an opportunity for students to learn about the theoretical background and experimental methods for unraveling ultrafast nuclear and electron dynamics happening on their natural time scales, from the introductory to the expert-level.		
Content of the subject 1) Generation of and application of ultrafast light sources: A) laser and laser-driven ultrashort pulses covering spectral domain from mid-IR to Soft-Xray (i.e. 2000 nm to 2 nm). B) Free-electron-laser bright light sources in the XUV and Xray spectral time domain. 2) Cutting-edge experimental methods used for time-resolved and pump-probe experiments. Theoretical models behind the generation of attosecond electron and photon beams. 3) Electron and nuclear-wave-packet dynamics and coherent control methods of interest for atomic, molecular and optical physics and physical chemistry. 4) Special topics developed for the students interested in the course.		
Recommended literature Attosecond and Strong-Field Physics: Principles and Applications by C.D. Lin, et. al. Cambridge University Press. (2018), and references therein.		
Number of active classes	Theory:	Practice:
Methods of delivering lectures Teaching in class		
Evaluation of knowledge (maximum number of points 100)		
The final grade would be based on homework exercises (50%), the presentation of a selected topic at the end of the semester (25%), and the oral exam (25%).		
*maximum length 1 A4 page		