Study program	Level of studies		**Third cycle**	
	Title of the study program		**Doctoral studies in physics**	
Course title	**ADVANCED QUANTUM MECHANICS**			
Course ID	Semester	Course status	ECTS credits	Teaching hours
PTH7011	**I/II**	**Elective**	**10**	**30**
Course aims and expected learning outcomes	The aim of the course is to familiarize students with the concepts and mathematical apparatus of quantum mechanics. Unlike quantum mechanics, which is studied in lower cycles, this advanced quantum mechanics course uses a deductive approach that is more suitable for researchers in theoretical physics.			

COURSE CONTENT

Fundamentals of quantum mechanics.

Postulates of quantum mechanics. Dynamics of quantum mechanics.

The uncertainty relation.

The two-particle problem.

Galileo's transformations. Angular momentum theory.

Discrete, dynamical and internal symmetries.

Identical particles.

Approximations in quantum mechanics. Second quantization. Scattering theory.

Path-integral method.

Relativistic quantum mechanics.

LITERATURE	ASSESSMENT OF LEARNING	
F. Herbut, *Kvantna mehanika za istraživače*, Fizički fakultet, Univerzitet u Beogradu, 1999. Broader literature: D. Milošević, *Relativistička kvantna mehanika*, Univerzitetski udžbenik, bosniaARS, Tuzla, 2005 B. H. Bransden, C. J. Joachain, *Quantum mechanics*, Prentice Hall, Harlow, 2000. A. Messiah, *Quantum mechanics*, North-Holland, Amsterdam, 1968. C. Cohen-Tannoudji, B. Diu, F. Laloe, *Quantum mechanics*, Wiley, New York, 1977. E. Merzbacher, *Quantum mechanics*, Wiley, New York, 1997. L. I. Šif, *Kvantna mehanika*, Vuk Karadžić, Beograd, 1968. I. Supek, *Teorijska fizika i struktura materije*, II dio, Školska knjiga, Zagreb, 1977. A. S. Davidov, *Kvantovaja mehanika*, Nauka, Moskva, 1973. F. Schwabl, *Advanced quantum mechanics*, Springer, Berlin, 1999.	Assessment Method	Points
	Homework	20
	Seminar papers	40
	Final exam	40
	Total	100

Remarks