DOCTORAL SCHOOL OF WROCŁAW UNIVERSITY OF SCIENCE AND TECHNOLOGY

SUPERVISOR/TEAM/ DECLARING/CONDUCTING COURSE: …….
DEPARTMENT ……

COURSE CARD

Course name in Polish: Wprowadzenie do mechaniki kwantowej
Course name in English: Introduction to quantum mechanics
Course language Polish / English*
University-wide general course type*:
1) basic science course (mathematics, physics, chemistry, computer science or other) : physics
2) humanities course: …….
3) management course: ……..
4) English language: ……
5) didactics of higher education course: ……

Specialized courses for PhD students receiving education in discipline*: ……..……..……
1) specialized course in discipline: ……..
2) interdisciplinary course in the field of several disciplines: ……
3) seminar in discipline or interdisciplinary: …….

Subject code: NFQ100281W

* delete as applicable

	Lecture	Foreign language course	Seminar	Mixed forms
Number of hours of organized classes in university (ZZU)	30			
Grading	Exam	Exam	Oral presentation	Exam, inspection, evaluation classes

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Ability to use methods of mathematical analysis and linear algebra
2. Knowledge of fundamebtals of physics
3. Ability to work with sources, including scientific literature in English

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COURSE OBJECTIVES

C1 Student will become familiar with advanced concepts and methods of quantum mechanics

PROGRAM CONTENTS

Form of classes – lecture (Lec)		Number of hours
Lec 1	*Basic ideas of quantum mechanics*	2
Lec 2	*Space of quantum states*	2
Lec 3	*Observables, commutativity, uncertainty principles*	2
Lec 4	*Time evolution; Schrödinger equation*	2
Lec 5	*Schrödinger equation without time; numerical methods*	2
Lec 6	*Measurement*	2
Lec 7	*Basic one-dimensional models*	4
Lec 8	*Angular momentum*	4
Lec 9	*Hydrogen atom*	4
Lec 10	*Many-body systems; spin and statistics; numerical methods*	3
Lec 11	*Entanglement*	3
	Total hours:	**30**

Form of classes – foreign language course (Lng)		Number of hours
Lng1		
Lng2		
Lng3		
..		
	Total hours:	

Form of classes – seminar (Sem)		Number of hours
Sem1		
Sem2		
Sem3		
…		
	Total hours:	

Form of classes – mixed forms (mix)		Number of hours
Mix1		
Mix2		
Mix3		
…		
	Total hours	

TEACHING TOOLS USED
N1. Lecture with elements of problem discussion N2. Calculation problems in form of homework N3.

ACHIEVED SUBJECT LEARNING OUTCOMES

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Type of learning outcome	Code of learning outcome	Assessment of learning outcome
Knowledge	P8S_WG	student has a sound knowledge of basic subjects such as mathematics, physics, chemistry or others
Knowledge		
…		
Skills		
Skills		
…		
Social competence		
Social competence		
…		

PRIMARY AND SECONDARY LITERATURE
PRIMARY LITERATURE: [1] L. Marchildon, Quantum Mechanics **SECONDARY LITERATURE:** [1] L. Schiff, Quantum Mechanics [2] R. Shankar, Principles of Quantum Mechanics
SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)
Katarzyna Roszak, katarzyna.roszak@pwr.edu.pl