University of Gdańsk

Subject card

Subject name and code	Physical Implementations of Quantum Information, PG_00193481		
Field of study	Quantum Information Technology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2027/2028
Education level	Master's studies	Subject group	Obligatory subject group in the field of study Subject group related to scientific research in the field of study
Mode of study	full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	English
Semester of study	3	ECTS credits	2.0
Learning profile	academic	Assessment form	credit
Conducting unit			
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Michał Horodecki	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	0.0	15

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	15	0.0	35.0	50

Subject objectives

To familiarize the students with experimental platforms relevant for implementations of quantum information techniques.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[QITL3_U02] is able to use their knowledge of quantum information technologies – formulate and solve complex and unusual problems and perform tasks innovatively in unpredictable conditions by appropriately selecting sources and information derived from them, evaluating, critically analyzing, synthesizing, creatively interpreting, and presenting this information.		
[QITL3_W02] knows and understands key topics and selected topics within the scope of advanced, detailed knowledge in the field of quantum information technologies.		
[QITL3_W01] knows and understands in depth selected facts, objects, and phenomena, as well as the methods and theories explaining the complex relationships between them, constituting advanced general knowledge in the field of quantum information technologies.		

Subject contents	Implementations of quantum information in with quantum optics, with ions and neutral cold atoms, as well as spins in semiconductor quantum dots, NV centers and molecules.	
Prerequisites and co-requisites		
Assessment methods and criteria	Subject passing criteria	Passing threshold / Percentage of the final grade
	essay	51.0% / 100.0%
Recommended reading	Basic literature	Quantum computation and quantum information, Michael A. Nielsen & Isaac L. Chuang, Cambridge : Cambridge University Press, 2000
	Supplementary literature	None.
	eResources addresses	
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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