GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Quantum mechanics, PG_00037290		
Field of study	Technical Physics		
Date of commencement of studies	October 2023	Academic year of realisation of subject	2025/2026
Education level	first-cycle studies	Subject group	Optional subject group 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	3	Language of instruction	Polish
Semester of study	5	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Theoretical Physics and Quantum Information -> Faculty of Applied Physics and Mathematics		
Name and surname of lecturer (lecturers)	Subject supervisor		
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	30.0	0.0	0.0	0.0	60

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	60	5.0	60.0	125

Subject objectives

Introduction to basic structures of quantum mechanics

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W02] Has systematized knowledge of the basics of physics, including mechanics, thermodynamics, electricity and magnetism, optics, atomic and particle physics, solid-state physics, nuclear and elementary particle physics.	Quantum mechanics forms a common element of many branches of science and thus helps to see them all in a unified way.	[SW1] Assessment of factual knowledge
[K6_U02] Can analyze and solve simple scientific and technical problems, based on possessed knowledge, using analytical, numerical, simulation and experimental methods.	Student: Derives basic properties of the Schroedinger equation Solves Schroedinger equation for harmonic oscillator and 1/r potential by creation-annihilation operator techniques Derives basic properties of orbital angular momentum and its eigenproblems Derives properties of the tensor produt for the case of n q-bits	[SU1] Assessment of task fulfilment

Subject contents

Introduction to nonrelativistic quantum mechanics of one and two spinless particles. Factorization method as a technique of solving Schroedinger equation. Angular momentum as an example of eigenvalue problem and special functions. Introduction to mathematical formalism of quantum information.

Prerequisites and co-requisites

Theoretical mechanics and mathematical methods of physics

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
Practical exercise	50.0%	50.0%
Oral exam	50.0%	50.0%

Recommended reading

Basic literature	I.Białynicki-Birula i in., Teoria kwantów, PWN, 1994 R. Schankar, Mechanika kwantowa, PWN, 2005 L. Landau, E.Lifszyc, Mechanika kwantowa - teoria nierelatywistyczna, PWN, 1980
Supplementary literature	No requirements

	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed	Qubinary coding Superpotential	
Work placement	Not applicable	