FACULTY OF MECHANICAL AND POWER ENGINEERING

SUBJECT CARD

Name of subject in Polish:	Fizyka zagadnienia wybrane
Name of subject in English:	**Physics – selected issues.**
Main field of study (if applicable):	**Power Engineering**
Specialization (if applicable):	
Profile:	**academic**
Level and form of studies:	**2nd level, full-time**
Kind of subject:	**obligatory**
Subject code:	**W09ENG-SM0035W**
Group of courses:	NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	30				
Number of hours of total student workload (CNPS)	60				
Form of crediting	crediting with grade				
For group of courses mark final course with (X)					
Number of ECTS points	2				
including number of ECTS points for practical (P) classes					
including number of ECTS points for direct teacher-student contact (BK) classes	1				

*delete as applicable

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

Competence in mathematics and physics confirmed by positive grades in physics and mathematics at the first level of study

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SUBJECT OBJECTIVES

C1 To familiarize students with the basic quantum phenomena and tools of quantum physics and preparation for professional use of quantum phenomena in energy power and cryogenics

SUBJECT LEARNING OUTCOMES

relating to knowledge:

PEU_W01 has structured and theoretically grounded detailed knowledge of basic quantum phenomena, tools used in quantum physics, and connections between quantum physics, power engineering and cryogenics

PROGRAM CONTENT

	Lectures	**Number of hours**
Lec 1	Introduction	2
Lec 2	The idea of modern physics	2
Lec 3	Wave function - meaning and application	2

Lec 4	Observables - meaning and application	2
Lec 5	Energy – Hamiltonian	2
Lec 6	Momentum & anular momentum - operators	2
Lec 7	Measurements in quantum physics & Heisenberg Principle	2
Lec 8	Wave and particle duality – appplications	2
Lec 9	Thermal phenomena - black body - the concept of photon	2
Lec 10	Hydrogenlike atom – eigenvalue problem	2
Lec 11	Magnetic phenomena _ Zeeman & Stern-Gerlach effects	2
Lec 12	Superconductivity	2
LEC 13	Superfluidity	2
Lec 14	Quantum diagnostics & Summary	2
Lec 15	Control work	2
	Total hours	30

TEACHING TOOLS USED

N1. The lecture of the information and problem character, multimedia presentation combined with traditional form

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end)	Learning outcomes number	Way of evaluating learning outcomes achievement
F1	PEK_W01	Kolokwium pisemno-ustne
P=F1		

PRIMARY AND SECONDARY LITERATURE

PRIMARY LITERATURE:

[1] [Wichman E.H., Quantum Physics", any edition
[2] Matthews P.T., „Introduction to Quantum Mechanics", any edition,
[3] Richtmyer F.K., Kennard E.H., Lauritsen T., "Introduction to Modern Physics", any edition

SECONDARY LITERATURE:

[1] L.D.Landau, E.M.Lifszyc, „Quantum mechanics", any edition
[2] R.P.Feynman, R.B.Leighton, M.Sands, „ The Feynmann Lecture of Fphysics", any edition

SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)

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