COURSE DESCRIPTION CARD - SYLLABUS

Course name
Solid state physics

Course

Field of study
Material Engineering

Year/Semester
1/1

Area of study (specialization)

Profile of study
general academic

Level of study
Second-cycle studies

Course offered in
Polish

Form of study
full-time

Requirements
compulsory

Number of hours

Lecture
15

Laboratory classes

Other (e.g. online)

Tutorials
15

Projects/seminars

Number of credit points

3

Lecturers

Responsible for the course/lecturer:
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tel.: 061 665 33 2361

Responsible for the course/lecturer:

Prerequisites

Basic knowledge of chemistry, physics and materials science.Logical thinking, use of the information obtained from library and Internet. Understanding the need for learning and acquiring new knowledge

Course objective

The knowledge of the relationships between the crystallographic structures and physical properties.

The knowledge of the basic solid state concepts and theories.

Course-related learning outcomes

Knowledge

1. The student has knowledge about the basis concepts and theories of solid state physics. K_W01 K_W08 K_W10

2.The student has knowledge about modern trends and important research fields of the solid state physics. K_W01, K_W08

Skills

1. The student can explain the basis facts and the solid state theories and can relate them to materials science. K_U01, K_U02, K_U11

2. The student can relate the physical properties and crystal structure. K_U01, K_U02, K_U11

Social competences

1. The student can collaborate in order to obtain and implement the new knowledge. K_K03

2. The student is aware of importance of solid state physics in modern science, industry and society. K_K02

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Written test at the end of the semester

Tutorias: Written test at the end of the semester and student activity in whole semester

Programme content

1. Basic crystallography

2. Crystallization processes

3. The influence of crystallographic structures on physical properties.

4. Optical properties of crystals

5. Dielectrics, piezoelectrics, pyroelectrics and ferroelectrics.

6. Electronic band theory

7. Semiconductors

8. Superconductivity

9. Surface physics

Teaching methods

Lecture: multimedia presentation

Tutorials: problem solving, discussion

Bibliography

Basic

1. C. Kittel, Wstęp do fizyki ciała stałego, Wydawnictwo Naukowe PWN, Warszawa, 1999

2. N.W. Ashcroft, N.D. Mermin, Fizyka ciała stałego, Państwowe Wydawnictwo Naukowe, Warszawa, 1986

Additional

1. M. Jurczyk, Nanomateriały, Wydawnictwo Politechniki Poznańskiej, Poznań 2001

2. L. A. Dobrzański, Wprowadzenie do nauki o materiałach, Wydawnictwo Politechniki Śląskiej, Gliwice 2007

3. M. Blicharski, Wstęp do inżynierii materiałowej, Wydawnictwo Naukowo-Techniczne, 2009

Breakdown of average student's workload

	Hours	ECTS
Total workload	68	3,0
Classes requiring direct contact with the teacher	33	2,0
Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) [1]	35	1,0

[1] delete or add other activities as appropriate