



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Crystallography [S1IMat1>Kryst]

### Course

Field of study

Materials Engineering

Year/Semester

2/4

Area of study (specialization)

–

Profile of study

general academic

Level of study

first-cycle

Course offered in

Polish

Form of study

full-time

Requirements

compulsory

### Number of hours

Lecture

15

Laboratory classes

0

Other

0

Tutorials

15

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr hab. Izabela Szafraniak-Wiza prof. PP  
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### Lecturers

### Prerequisites

Basic knowledge of chemistry, physics and materials science. Logical thinking, spatial imagination. Understanding the need for learning and acquiring new knowledge.

### Course objective

1. The basic knowledge of crystalline structures of materials. 2. The basic knowledge of crystallography.

### Course-related learning outcomes

Knowledge:

1. the student has knowledge about crystal lattice. k\_w08
2. the student knows the diffraction laws. k\_w08

Skills:

1. the student can describe the crystallographic properties of materials. k\_u09
2. the student can describe symmetry of periodic lattice. k\_u01

Social competences:

1. the student can collaborate in order to obtain and implement the new knowledge. k\_k03
2. the student can gain and correct his/her knowledge as results of the discussion. k\_k10

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Learning outcomes presented above are verified as follows:

Lecture: Written test at the end of the semester

Tutorials: Preparation for the classes and activity, written test at the end of the semester

### Programme content

Subject and history of crystallography.

Classification of solid state materials

Crystal definitions

Crystallographic symmetry and its notation

Point and space groups

Miller index (points, axes, directions, planes)

Bravais lattice

Diffraction and Bragg and Laue laws

Real crystals and crystallographic defects

Basic structures

Structural phase transitions

### Course topics

The basic crystallography.

### Teaching methods

Lecture: multimedia presentation

Tutorials: problem solving, discussion, usage of crystallographic models

### Bibliography

Basic

1. T. Pękała, Zarys krystalografii, PWN 1983

2. Z. Trzaska Durski, H. Trzaska Durska „Podstawy Krystalografii”, PWN, 1994.

3. Z. Kosturkiewicz, Metody krystalografii, Wydawnictwo Naukowe UAM, Poznań 2000.

Additional

1. C. Kittel, „Wstęp do fizyki ciała stałego”, PWN, W-a, 1999.

2. P. Luger, „Rentgenografia strukturalna monokryształów”, PWN Warszawa 1989.

3. „Międzynarodowe Tablice Krystalograficzne”

4. J. Mizera, J. Zdunek, Krystalografia, PW

([www.inmat.pw.edu.pl/download/epodreczniki/Krystalografia\\_do\\_PNoM1.pdf](http://www.inmat.pw.edu.pl/download/epodreczniki/Krystalografia_do_PNoM1.pdf)) 1. Scientific papers

### Breakdown of average student's workload

	Hours	ECTS
Total workload	70	3,00
Classes requiring direct contact with the teacher	35	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	35	1,00