



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Sintered materials [S1IMat1>WS]

### Course

Field of study

Materials Engineering

Year/Semester

4/7

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

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

dr hab. inż. Marek Nowak prof. PP  
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### Lecturers

### Prerequisites

Basic knowledge of materials science, physics and chemistry, material processing technology. Logical thinking, exploring of various sources of knowledge. Understanding of necessity of learning and acquisition of new knowledge.

### Course objective

The student should acquire knowledge on practical problems related to the technology of obtaining sintering materials.

### Course-related learning outcomes

Knowledge:

1. the student knows the properties and applications of sintered materials and methods of testing their properties - [k\_w08, k\_w10]
2. the student knows the methods of producing and processing of powders and methods for testing their properties - [k\_w12]
3. the student knows and understands the objectives of individual process steps that occur in the production of sintered materials -[k\_w12]

#### Skills:

1. the student is able to select a sintered material - [k\_u16, k\_u21]
2. the student is able to propose the technology of sintered material and determine its properties - [k\_u09, k\_u21]

#### Social competences:

1. the student is aware of the role of sintered materials in modern economy and society - [k\_k02]

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

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Lecture: credit on the basis of tests of general and detailed knowledge presented during classes in the subject

Laboratory classes: assessment of knowledge and skills related to the implementation of individual laboratory tasks. Completion of all tasks and acceptance by the lecturer of all reports.

### Programme content

Methods of powder synthesis and their characteristics. Properties and characteristics of ceramic and metallic powders. Properties of materials made by the powder metallurgy. Powder shaping methods. Sintering processes. The influence of technological parameters on the properties of sintering materials. Developing the sintering materials with special properties. Methods of examining the properties of sintering materials.

### Teaching methods

Lecture: presentation illustrated with examples given on a blackboard

Laboratory classes: practical exercises, discussion and preparation of the results in the form of a report, formulation of conclusions regarding the issues discussed during classes.

### Bibliography

#### Basic

1. W. Rutkowski, Projektowanie właściwości wyrobów spiekanych z proszków i włókien, PWN, Warszawa 1977.
2. R. Pampuch, K. Haberkowicz, M. Kordek, Nauka o procesach ceramicznych, PWN, 1992

#### Additional

1. Wyatt, D. Hughes, Wprowadzenie do inżynierii materiałowej, Metale, ceramika i tworzywa sztuczne, WNT, 1978.
2. Szkło i Ceramika, czasopismo, dwumiesięcznik, wydawnictwo SIGMA-NOT.
3. M. Jurczyk, J. Jakubowicz - Nanomateriały ceramiczne, Wydawnictwo PP 2004.
4. J. Nowacki, Spieki metali w budowie maszyn. Wyd. Politechnika Łódzka, Łódź 1997.

### Breakdown of average student's workload

	Hours	ECTS
Total workload	75	3,00
Classes requiring direct contact with the teacher	30	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	45	1,00