



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Ceramics and glass [S1IMat1>CiS]

### Course

Field of study

Materials Engineering

Year/Semester

3/5

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

30

Laboratory classes

15

Other (e.g. online)

0

Tutorials

0

Projects/seminars

0

### Number of credit points

3,00

### Coordinators

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### Lecturers

### 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

1. The basic knowledge of ceramics and glasses. 2. The selections of ceramics and glasses for the specific applications. 3. Development students' knowledge related to relationships between technologic processes, technologic conditions, structures, properties and applications of ceramic and glassy materials

### Course-related learning outcomes

Knowledge:

1. The student has knowledge about ceramics and glasses [K\_W08 K\_W10].
2. The student has knowledge about technology related to the ceramics and glasses [K\_W08,K\_W12, K\_W14].

Skills:

1. The student can select the proper ceramics or glasses for specific applications [K\_U16, K\_U21].

2. The student can propose applications of ceramics and glasses [K\_U16, K\_U21].
3. The student can perform the basic investigation of ceramics and glasses [K\_U08, K\_U10].

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 ceramics and glasses in modern industry and society [K\_K02].

### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Written exam at the end of the semester

Tutorials: Written or oral tests during each classes, reports, activity and written test at the end of the semester.

### Programme content

Lectures:

1. Introduction and historical background
2. Basic properties of ceramics and glasses
3. Basic technology of ceramics
4. Specific properties of ceramics
5. Traditional ceramics
6. Modern ceramics
7. Electroceramics
8. Basic technology of glasses
9. Glass applications
10. Nanomaterials, nanoceramics
11. Nanocomposites

Laboratory:

1. Phase diagram analysis
2. Structural investigations of special materials
3. Basic properties of ceramics
4. Traditional ceramics
5. Modern ceramics

### Course topics

Ceramic and glass materials

### Teaching methods

Lecture: multimedia presentation

Tutorials: scientific papers, investigation of basic properties, problem solving, discussion

### Bibliography

Basic:

1. R. Pampuch, Współczesne materiały ceramiczne, Uczelniane Wyd. Naukowo-Dydaktyczne AGH, Kraków 2005
2. R. Pampuch, K. Hajerko, M. Kordek, Nauka i procesach ceramicznych, Wyd. Naukowe PWN 1992
3. M. Jurczyk, J. Jakubowicz, Nanomateriały ceramiczne. Wyd. Pol. Pozn.
4. M. Blicharski, „Wstęp do inżynierii materiałowej”
5. A. Łagosz, E. Brylska, G. Małata, J. Małolepszy, J. Stolecki, M. Reben, M. Gawlicki, M. Petri, W. Pichór, W. Nocuń-Wczelik, W. Brylicki, W. Roszczynialski, Z. Pytel, Podstawy technologii materiałów budowlanych i metody badań, Wydawnictwo AGH, Kraków 2013
6. M. Kosmał, A. Kuśnierz, M. Kozłowski, Szkło budowlane, Wydawnictwo Naukowe PWN, 2022

Additional:

1. M. Jurczyk, Nanomateriały. „Wybrane zagadnienia”, Wydawnictwo Politechniki Poznańskiej, 2001
2. M. Jurczyk „Mechaniczna synteza”, Wydawnictwo Politechniki Poznańskiej, 2003
3. R. Pampuch. Siedem wykładów o ceramice, Uczelniane Wyd. Naukowo-Dydaktyczne AGH, Kraków

2001

4. „Elektroceramika ferroelektryczna”, Z. Surowiak (red.) Wydawnictwo UŚ, Katowice 2004

#### Breakdown of average student's workload

	Hours	ECTS
Total workload	74	3,00
Classes requiring direct contact with the teacher	49	2,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	25	1,00