



## COURSE DESCRIPTION CARD - SYLLABUS

Course name

Elective laboratory (Engineering of porous materials and media)

### Course

Field of study

Chemical and process engineering

Area of study (specialization)

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

3/6

Profile of study

general academic

Course offered in

Polish

Requirements

elective

### Number of hours

Lecture

Laboratory classes

Other (e.g. online)

15

Tutorials

Projects/seminars

### Number of credit points

1

### Lecturers

Responsible for the course/lecturer:

Dominik Mierzwa, Ph.D.

Responsible for the course/lecturer:

### Prerequisites

The student who starts the subject: has a well-established knowledge of mathematics, physics, and chemistry and the subject matter engineering of porous materials and media enabling understanding and interpretation of physical phenomena in porous materials; can work in a collective, plan and carry out experiments, interpret results obtained and draw conclusions; can acquire and supplement knowledge from academic textbooks and other books; is aware of the responsibility for the tasks carried out by teamwork; understands the need for continuous training, self-fulfillment and setting ambitious goals on the way to achieve higher education.

### Course objective

Acquainting with complex processes occurring in porous materials.

### Course-related learning outcomes

Knowledge

1. Has knowledge of physics and chemistry to the extent that allows understanding and description of phenomena and processes occurring in porous materials. (K\_W02)



2. Knows the basics of control and measurement systems and equipment used in the study of porous materials. (K\_W07)

3. Knows the laws of kinetics, thermodynamics, and catalysis of chemical processes in capillary-porous materials. (K\_W10)

#### Skills

1. Can choose the right way to solve simple engineering tasks/problems related to chemical and process engineering in porous materials and media. (K\_U18)

2. Can choose the right equipment to solve simple engineering tasks/problems related to chemical and process engineering in porous materials and media. (K\_U19)

#### Social competences

1. Understands the need to train and improve your professional and personal competences. (K\_K01)

2. Is aware of the importance of behavior in a professional manner and adherence to the principles of professional ethics. (K\_K03)

#### Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

The final grade is determined on the basis of the average of the grades for the reports made during the classes, according to the following scale: 51% -60% (3.0), 61% -70% (3.5); 71% -80% (4.0), 81% -90% (4.5), 91% -100% (5.0).

#### Programme content

The scope of the subject includes the following issues: structure testing methods, heat and mass transfer issues in porous materials for drying processes, capillary measurement, determination of heat transfer coefficients depending on the moisture content of the material, determination of mechanical strength of porous materials, filtration issues.

#### Teaching methods

Discussion in the laboratory group and execution of the exercises provided for in the laboratory program - practical exercises.

#### Bibliography

Basic

1. Inżynieria materiałów porowatych, wyd. 1. Kowalski S.J., Wydawnictwo Politechniki Poznańskiej, Poznań, 2004

2. Inżynieria materiałów porowatych, wyd. 1. Banaszak J., Wydawnictwo Politechniki Poznańskiej, Poznań, 2005



Additional

1. Handbook of porous media, wyd. 3. Kambiz V. (ed.), CRC Press, Boca Raton (FL, USA), 2015.
2. Ruch masy w ciałach porowatych, Aksielrud G.A., Altszuler M.A., WNT, Warszawa, 1987.
3. The physics of flow through porous media, Scheidegger A.E., University of Toronto Press, Toronto, 1957.
4. Własności mechaniczne materii, Cottrell A.H., PWN, Warszawa , 1970.

**Breakdown of average student's workload**

|   | Hours | ECTS |
|---|-------|------|
| Total workload  | 30    | 1,0  |
| Classes requiring direct contact with the teacher   | 20    | 0,7  |
| Student's own work (literature studies, preparation for laboratory classes/tutorials, preparation for tests/exam, project preparation) <sup>1</sup> | 10    | 0,3  |

<sup>1</sup> delete or add other activities as appropriate