



COURSE DESCRIPTION CARD - SYLLABUS

Course name

Hydrogen, an energy carrier

Course

Field of study

Materials Engineering

Area of study (specialization)

Nanomaterials

Level of study

First-cycle studies

Form of study

full-time

Year/Semester

2/3

Profile of study

general academic

Course offered in

polish

Requirements

compulsory

Number of hours

Lecture

15

Laboratory classes

15

Other (e.g. online)

Tutorials

Projects/seminars

Number of credit points

2

Lecturers

Responsible for the course/lecturer:

dr Mateusz Balcerzak

Responsible for the course/lecturer:

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Faculty of Materials Engineering and Technical

Physics

Piotrowo 3 Street, 60-965 Poznań

Prerequisites

Knowledge: basic in chemistry, physics, materials science

Skills: logical thinking, using information obtained from the library and the Internet

Social competences: understanding the need to learn and acquire new knowledge

Course objective

1.To provide students with basic knowledge about hydrogen as an energy carrier, the method of its production and methods of its storage.



2. Developing students' skills in solving simple problems related to the selection of materials reversibly absorbing hydrogen.

Course-related learning outcomes

Knowledge

1. Student should characterize the methods of obtaining and using hydrogen. - [K_W04, K_W08]
2. The student should characterize the methods of hydrogen storage - [K_W04, K_W08]
3. The student should characterize the basic methods of producing materials that can be reversibly absorbing hydrogen - [K_W04, K_W08]

Skills

1. Student is able to select materials that can be reversibly absorbing hydrogen depending on the application - [K_U13]
2. The student is able to carry out research on materials that can be reversibly absorbing hydrogen - [K_U08, K_U10]

Social competences

1. The student is aware of the role of hydrogen-reversible materials in the modern economy and for society - [K_K02]

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: Exam / credit on the basis of a test consisting of 5 general questions (credit if the correct answer to at least 3 questions: <3? Ndst, 3? Dst, 3.5? Dst +, 4? Db, 4.5? Db +, 5? Bdb) carried out at the end of the semester.

Laboratory: Assessment based on an oral or written answer regarding the content of each performed laboratory exercise, a report on each laboratory exercise according to the instructions of the laboratory teacher. In order to pass the laboratories, all exercises must be passed (positive grade from the answers and the report).

Programme content

Lecture:

Introduction to issues related to the subject of hydrogen, the economy of hydrogen, methods of obtaining hydrogen, methods of hydrogen storage, the use of hydrogen.

Teaching methods

Lecture: multimedia presentation, presentation illustrated with examples given on the board,

Laboratory exercises: carrying out hydrogen projects, searching for data and their processing in a multimedia form, formulating conclusions, multimedia presentation.



Bibliography

Basic

1. B. Staliński, J. Terpiłowski, Wodór i wodorki, Warszawa : Wydawnictwa Naukowo-Techniczne, 1987
2. L. Romański, Wodór nośnikiem energii, UWP, Wrocław 2007

Additional

1. Surygała J., Wodór jako paliwo, WNT, Warszawa, 2008.
2. M. Jarczyk, Nanomateriały, wybrane zagadnienia, WPP 2001

Breakdown of average student's workload

	Hours	ECTS
Total workload	68	2,0
Classes requiring direct contact with the teacher	33	1,0
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