COURSE DESCRIPTION CARD - SYLLABUS

Course name
Production and use of hydrogen [S1MiTPM1>OiZW]

Course

Field of study
Materials and technologies for automotive industry

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
0

Projects/seminars
15

Number of credit points

2,00

Coordinators

Marek Nowak

Lecturers

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 knowledg

Course objective

1. Providing students with basic knowledge about hydrogen as an energy carrier and how to obtain it and methods of its storage. 2. Developing students' ability to solve simple problems related to the selection of materials that reversibly absorb hydrogen. 3. Developing students' teamwork skills

Course-related learning outcomes

Knowledge:
1. The student should characterize the methods obtaining and use of hydrogen.
2. The student should characterize hydrogen storage methods.
3. The student should characterize the basic methods of producing materials that reversibly absorb hydrogen.
4. The student knows how hydrogen affects the properties of materials.

Skills:
1. The student is able to choose a method of hydrogen storage.
2. Student can design an alloy that reversibly absorbs hydrogen.
3. The student is able to conduct research on materials that reversibly absorb hydrogen.

Social competences:
1. Student can cooperate in a group.
2. The student is aware of the role of hydrogen in the modern economy and for society.

Methods for verifying learning outcomes and assessment criteria

Learning outcomes presented above are verified as follows:

Lecture: credit based on general and specific knowledge tests presented during the course Projects: credit based on the effects of the completed project

Programme content

Basic issues related to the production and use of hydrogen

Course topics

Introduction to issues related to hydrogen. The student knows traditional and future methods of obtaining and storing hydrogen. He knows what the most important applications of hydrogen in the energy and automotive sector are. The student is able to indicate the advantages and disadvantages of various methods of obtaining and storing hydrogen. Effect of hydrogen on material properties.

Teaching methods

Lecture: presentation illustrated with examples given on a blackboard
Projects: individual project work of the student

Bibliography

Basic:
1. B. Staliński, J.Terpiłowski, Wodór i wodorki, Warszawa : Wydawnictwa Naukowo-Techniczne, 1987
2. L. Romański, Wodór nośnikiem energii, UWP, Wrocław 2007
3. Jan Surygała. Wodór jako paliwo. WNT, Warszawa 2008.
3. Paweł Jan Nowacki. Wodór jako nowy nośnik energii. Wszechnica Polskiej Akademii Nauk. - Zakł. Nar. im. Ossolińskich, Wrocław 1983.

Additional:
1. M. Jurczyk, Nanomateriały, wybrane zagadnienia, WPP 2001
2. Szlachta J. (red.) Niekonwencjonalne źródła energii, Wyd. AXA, 2009.
3. Seria: Biuletyn Polskiego Stowarzyszenie Wodoru i Ogniw Paliwowych, czasopisma (International Journal of Hydrogen Energy, Energetyka i Ekologia, Czysta Energia i in.), internet

Breakdown of average student's workload

	Hours	ECTS
Total workload	50	2,00
Classes requiring direct contact with the teacher	30	1,00
Student's own work (literature studies, preparation for laboratory classes/ tutorials, preparation for tests/exam, project preparation)	20	1,00