GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	TECHNICAL PROCESSES OF RENEWABLE ENERGY, PG_00064336		
Field of study	Chemical Technology		
Date of commencement of studies	February 2025	Academic year of realisation of subject	2025/2026
Education level	second-cycle studies	Subject group	Optional subject group Specialty subject group Subject group related to scientific research in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	1	Language of instruction	Polish
Semester of study	2	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Corrosion and Electrochemistry -> Faculty of Chemistry -> Wydziały Politechniki Gdańskiej		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Juliusz Orlikowski	
	Teachers	prof. dr hab. inż. Juliusz Orlikowski	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	30	5.0	40.0	75

Subject objectives

The aim of the course is to obtain knowledge about the technological processes of e-fuel production and other renewable energy installations.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K7_K01] critically evaluates the content of cognitive and practical problems	The student is able to appropriately define priorities for the implementation of specific tasks.	[SK5] Assessment of ability to solve problems that arise in practice
[K7_U03] designs innovative technological solutions for obtaining useful goods based on the state of the knowledge in accordance with the latest scientific literature	The student is able to use the equipment to perform a technological process in laboratory conditions.	[SU4] Assessment of ability to use methods and tools
[K7_W02] selects appropriate apparatus and materials for the manufacture and processing of consumer goods	The student knows the methods of producing renewable energy	[SW1] Assessment of factual knowledge

Subject contents

Technological processes for obtaining renewable energy will be presented, including the extraction of methane, hydrogen, syngas, and methanol. Information on the production of e-fuels will be presented. Design solutions and technological conditions for individual production stages will be discussed. Against this background, the mechanisms of high-temperature corrosion processes will be presented. Hydrogen degradation in such forms as hydrogen cracking, hydrogen embrittlement, creep, and high-temperature corrosion will be discussed in detail.

Prerequisites and co-requisites

Basic knowledge of chemical engineering and chemical equipment

<table>
<tr><td>Assessment methods and criteria</td><td colspan="2"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>Laboratory</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>Exam</td><td>60.0%</td><td>50.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Prabir Basu, Biomass Gasification, Pyrolysis and Torrefaction, Elsevier, 2013

2. S. Wang, Z. Luo, Pyrolysis of Biomass, De Gruyter, 2016</td></tr>
<tr><td>Supplementary literature</td><td>Nie jest wymagana

Not required</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">Calculating the yield of the WGSR reaction
Explaining the corrosion mechanisms occurring in the aqueous stream after the FT reactor
Describe the reaction mechanisms occurring during FT synthesis</td></tr>
<tr><td>Work placement</td><td colspan="2">Not applicable</td></tr>
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