GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Sustainability in the chemical industry - team project, PG_00060879		
Field of study	Chemical Technology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2029/2030
Education level	first-cycle studies	Subject group	Optional 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	4	Language of instruction	Polish
Semester of study	7	ECTS credits	2.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Chemistry and Technology of Functional Materials -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Anna Schmidt	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	0.0	0.0	0.0	15.0	0.0	15

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	15	5.0	30.0	50

Subject objectives

Familiarizing students with the existing possibilities of modifying existing technologies to meet the assumptions of sustainable development and designing alternative technologies.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W04] Possesses the technical knowledge necessary to analyze processes and design installations in the chemical industry.	independently selects the equipment and process conditions, taking into account the life cycle of individual installation elements in the project.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects
[K6_W03] Has knowledge in the field of chemical technology and environmental protection, including sustainable development, green chemistry, modern energy sources and the principles of minimizing the impact of industrial processes on the environment and work safety	is able to design technological solutions enabling the production of chemical compounds in waste-free conditions. It can transform existing technologies into processes that significantly reduce waste generation. The student is able to determine environmental hazards appropriate to a given technology. May propose the implementation of new solutions. The student is able to independently assess selected technologies in terms of their impact on the natural environment. It is possible to propose changes that would enable the process to be classified as a green technology.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects

Subject contents

Course content – project
Selection of existing technological processes. Discussion of existing environmental problems. Attempts to find methods to reduce emissions, sewage and waste generation. Discussion of alternative technologies, for example based on other raw materials, using green energy sources. Group projects based on your own technological concepts. Preparation of mass and energy balance. Selection of technological parameters and appropriate equipment. Management of all mass streams.

Prerequisites and co-requisites

Knowledge of the basics of chemical technology, chemical equipment, chemical engineering

<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>Multimedia presentation</td><td>60.0%</td><td>40.0%</td></tr>
<tr><td>Ggroup project in the form of a written study.</td><td>60.0%</td><td>60.0%</td></tr>
</table></td></tr>
<tr><td rowspan="3">Recommended reading</td><td>Basic literature</td><td>1. Vincenzo Piemonte, Marcello De Falco, Angelo Basile, Sustainable Development in Chemical Engineering: Innovative Technologies, Wiley 2013, ISBN: 978-1-119-95352-4
2. Dai-Viet N. Vo, Sumaiya Zainal Abidin, P. Senthil Kumar, Muthusamy Govarthanan, Emerging Research Trend in Chemical Technology Towards Sustainable Development, Wiley biblioteka online, https://doi.org/10.1002/ceat.202270806
3. Edited By Miguel A. Esteso, Ana Cristina Faria Ribeiro, A. K. Haghi, Chemistry and Chemical Engineering for Sustainable Development Best Practices and Research Directions, ISBN 9781774639085</td></tr>
<tr><td>Supplementary literature</td><td>Environment, Development and Sustainability A Multidisciplinary Approach to the Theory and Practice of Sustainable Development, Springer journal</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="2">1. Hydrogen production from water, methane (other organic compounds), biomass, coal.
2. Hydrogen storage.
3. Sulfur production.
4. Production of fuels from various raw materials.
5. Production of polyurethanes from various raw materials.
6. Production of butyraldehyde from various raw materials.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="2">Not applicable</td></tr>
</table>

Document generated electronically. Does not require a seal or signature.