GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Chemical transformations of crude oil, PG_00069029		
Field of study	Chemical Technology		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2028/2029
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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	assessment
Conducting unit	Department of Organic Chemistry -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Dariusz Witt	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	20.0	0.0	10.0	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	10.0	35.0	75

Subject objectives

Refinery processes as hydrocraking and isomerization, formation of side products, using sodium hydroxide involved in processes will be discussed. Catalytic transformation, production and deactivation of catalysts by poisons will be presented.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_U08] Is able to select elements of automatic control systems for simple technological processes and use computer programs to control and optimize chemical processes.	understand technological processes. Technological processes can be verified in rational way by students.	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools
[K6_W07] Has knowledge of raw materials and technologies in the chemicaland polymer industries, also covering issues of corrosion and material protection.	is familiar with the properties of raw materials used in manufacturing processes and understands issues related to their stability and availability.	[SW1] Assessment of factual knowledge [SW2] Assessment of knowledge contained in presentation
[K6_K01] Is aware of the social role of a technical university graduate and understands the need to provide information about technical achievements and engineering activities to society, including through the media.	is able to present technological achievements in a clear and responsible manner, taking into account the needs of the audience.	[SK1] Assessment of group work skills [SK5] Assessment of ability to solve problems that arise in practice

Subject contents

Course content – lecture
Chemical transformations involved in the refinery plant: Hydro-processes HDS, HDN, HDO, hydrocracking isomerization. Side products formation involved in cracking and addition of alkenes. The ammonia washing, solubility of water in hydrocarbons, hydrolysis, using of sodium hydroxide oil hydrorefination involved in refinery processes. The catalysts involved in refinery process, their formation mechanism of action and deactivation by poisons.

Course content – laboratory
Oxidation and reduction of hydrocarbons. The TLC analysis of aromatic and aliphatic hydrocarbons.

Prerequisites and co-requisites

Organic chemistry basic course

<table>
<tr><td>Assessment methods and criteria</td><td colspan="3"><table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>laboratory reports</td><td>60.0%</td><td>50.0%</td></tr>
<tr><td>lecture tests</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 colspan="2">Vademecum Rafinera Ropa Naftowa właściwości przetwarzanie produkty Jan Surygała</td></tr>
<tr><td>Supplementary literature</td><td colspan="2">Organic chemistry Morrison Boyd</td></tr>
<tr><td>eResources addresses</td><td colspan="2"></td></tr>
<tr><td>Example issues/ example questions/ tasks being completed</td><td colspan="3">1. Provide mechanism and conditions for hydrocracking process.

2. What is the mechanism of isomerization for hydrocarbons and the properties of products.

3. What kind if catalysts are applied in refinery plants and how they can be deactivated by poisons.

4. What is solubility of water in hydrocarbons and its consequences for technological processes.</td></tr>
<tr><td>Practical activites within the subject</td><td colspan="3">Not applicable</td></tr>
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