University of Gdańsk

Subject card

Subject name and code	Biofuels, PG_00179517		
Field of study	Chemistry		
Date of commencement of studies	October 2026	Academic year of realisation of subject	2026/2027
Education level	Master's studies	Subject group	Optional subject group
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	1.0
Learning profile	academic	Assessment form	credit
Conducting unit	Laboratory of Advanced Oxidation Processes -> Department of General and Inorganic Chemistry -> Faculty of Chemistry -> Rector		
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. Ewa Siedlecka	
	Teachers		

Lesson types

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	0.0	0.0	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	2.0	8.0	25

Subject objectives

familiarizing students with the energy situation in the country and the world, types of energy sources, the types of biofuels, their production and application, chemical and microbiological methods of obtaining (bio)hydrogen, methods of its storage, use in fuel cells, hydrogen-based transport with methods of generating energy based on microbiological cells, developing the ability to conduct an experiment, ability to apply the methodology given in the manual and interpret the obtained results, ability to present results in writing

Learning outcomes

Course outcome	Subject outcome	Method of verification
[CHEMMU2_W05] Has extended knowledge in the field of the specialisation studied.	- classifies raw materials and biofuel production technologies - discusses the energy situation of the country and the world - Discusses the advantages and disadvantages of producing and using biofuel	[SW1] oral statement/ conversation/discussion [SW2] presentation/project/paper/ report
[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.	- performs experiments based on the instructions,solves problems as they are performed - discusses and formulates own opinions based on the presented knowledge	[SK1] oral statement/conversation/ discussion
[CHEMMU2_U04] Applies acquired knowledge of chemistry and related scientific disciplines.	- Explains and understands the basic chemical and biochemical processes occurring during biofuel production - applies the basic technological concept describing the biofuel production process,	[SU1] oral statement/conversation/ discussion [SU2] presentation/project/paper/ report

<table>
<tr><td>Subject contents</td><td>Characteristics of renewable energy sources. Conditions of the current energy policy and forecasts for the future.
Legislation regarding energy and bioenergy in Poland. Biomass energy resources. Biomass waste as a raw material for the production of energy and liquid and gaseous biofuels. Characteristics of gaseous biofuels: biogas production, chemical, biochemical and other methods of biohydrogen production, methods of storing and using hydrogen, fuel cells. Characteristics of liquid biofuels. The impact of fuel quality on the quality of exhaust gases. Technology for the production of third and fourth generation biofuels: bioethanol from lignocellulose, biodiesel from algae, pyrolysis and gasification of biomass and municipal waste. Obtaining synthetic gasoline from biomass. Microbiological cells as an energy source for medical purposes, energy recovery from sewage. Selected examples of energy generation technologies.
Topics of laboratory exercises: basics of laboratory work, performing exercises thematically related to obtaining energy from unconventional sources and biofuels.</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>organic and inorganic chemistry</td></tr>
<tr><td>Assessment methods and criteria</td><td>
<table>
<tr><th>Subject passing criteria</th><th>Passing threshold</th><th>Percentage of the final grade</th></tr>
<tr><td>grade for work in classes</td><td>51.0%</td><td>50.0%</td></tr>
<tr><td>grade for preparing the assigned task</td><td>51.0%</td><td>50.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<tr><td>Basic literature</td><td>current literature provided by the teacher</td></tr>
<tr><td>Supplementary literature</td><td>literature searched independently by students on a given topic</td></tr>
<tr><td>eResources addresses</td><td></td></tr>
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<tr><td>Example issues/ example questions/ tasks being completed</td><td>Oxford debate on hydrogen as the fuel of the future</td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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