University of Gdańsk

Subject card

Subject name and code	Advanced processes in environment protection, PG_00121141						
Field of study	Chemical Business, Chemistry, Environmental Protection						
Date of commencement of studies	October 2026		Academic year of realisation of subject	2027/2028			
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	2		Language of instruction	English			
Semester of study	3		ECTS credits	2.0			
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	10.0	0.0	0.0	0.0	0.0	10
	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	10		2.0	38.0	50	
Subject objectives	- introduction of basic issues connected with advanced processes applied in synthesis - introducing basic issues related to advanced processes involved in environmental protection						

<table>
<tr><td>Learning outcomes</td><td>
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<tr><th>Course outcome</th><th>Subject outcome</th><th>Method of verification</th></tr>
<tr><td>[CHEMMU2_K01] Knows the limitations of her/his own knowledge; understands the need for further education and can inspire other people to do so.</td><td>understands the need to learn; cooperates in a group, taking on different roles; shows creativity in determining the necessary priorities for the implementation of tasks; understands the social aspects of the practical use of knowledge and skills, as well as those related to responsibility</td><td>[SK1] oral statement/conversation/ discussion</td></tr>
<tr><td>[CHEMMU2_W11] Demonstrates general knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field.</td><td>classifies advanced processes used in synthesis and environmental protection</td><td>[SW1] oral statement/ conversation/discussion
[SW2] presentation/project/paper/ report</td></tr>
<tr><td>[CHEMMU2_W07] Selects experimental and theoretical techniques to the extent necessary to understand the description and modelling of medium complexity chemical processes.</td><td>proposes solutions to environmental problems related to reducing anthropogenic pollution; presents correct chemical arguments understandably – both orally and in writing; presents and explains advanced processes, using chemical knowledge in correlation with other sciences;</td><td>[SW1] oral statement/ conversation/discussion
[SW2] presentation/project/paper/ report</td></tr>
<tr><td>[CHEMMU2_U01] Plans and implements chemical experiments of medium complexity.</td><td>performs experiments with an understanding based on instructions</td><td>[SU1] oral statement/conversation/ discussion
[SU8] observation of student's independent or team work</td></tr>
<tr><td>[CHEMMU2_U06] Presents the results of scientific discoveries in chemistry and related disciplines in an understandable way.</td><td>describing fundamental issues connected with advanced processes applied in synthesis and industrial production;</td><td>[SU1] oral statement/conversation/ discussion
[SU2] presentation/project/paper/ report</td></tr>
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<tr><td>Subject contents</td><td>Advanced processes in the synthesis: production of fuels and polymers from waste as technologies ensuring sustainable development of society, synthesis of biodegradable materials, selective synthesis assisted by electromagnetic radiation. Advanced processes in environmental protection: water treatment, water disinfection, pharmaceuticals and microplastics removal, application of biological membrane reactors, electrochemical oxidation, and ozonation as a method of removing micropollutants or water disinfection, the Fenton method for the disposal of hazardous waste</td></tr>
<tr><td>Prerequisites and co-requisites</td><td>non</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>performing assigned tasks</td><td>51.0%</td><td>70.0%</td></tr>
<tr><td>activity during classes</td><td>51.0%</td><td>30.0%</td></tr>
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<tr><td>Recommended reading</td><td>
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<tr><td>Basic literature</td><td>literature provided by the teacher during classes</td></tr>
<tr><td>Supplementary literature</td><td>non</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></td></tr>
<tr><td>Work placement</td><td>Not applicable</td></tr>
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