



Subject card

Subject name and code	Production Technology of Renewable and Alternative Fuels, PG_00069689						
Field of study	Recycling and Energy Recovery						
Date of commencement of studies	October 2024	Academic year of realisation of subject		2026/2027			
Education level	first-cycle studies	Subject group					
Mode of study	Full-time studies	Mode of delivery		at the university			
Year of study	3	Language of instruction		Polish			
Semester of study	5	ECTS credits		10.0			
Learning profile	general academic profile	Assessment form		assessment			
Conducting unit	Department of Process Engineering and Chemical Technology -> Faculty of Chemistry -> Faculties of Gdańsk University of Technology						
Name and surname of lecturer (lecturers)	Subject supervisor		dr hab. inż. Jacek Gębicki				
	Teachers		dr hab. inż. Jacek Gębicki				
Lesson types	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	0.0	0.0	0.0	100.0	0.0	100
	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	100		10.0		140.0	250
Subject objectives	The aim of this course is to familiarize students with the production of refuse-derived fuel (RDF). In addition to theoretical knowledge (project completion), students will learn the basic steps of RDF production during a study visit to an operating RDF production facility.						
Learning outcomes	Course outcome		Subject outcome		Method of verification		
	[K6_K02] cooperates with other people in the implementation of teamwork, both as a leader and a team member, effectively achieving the assumed goals.		The student is able to work in a team to achieve the intended goals.		[SK5] Assessment of ability to solve problems that arise in practice [SK1] Assessment of group work skills		
	[K6_U03] designs processes, technologies and systems related to the recovery of raw materials and energy, using appropriate concepts, standards and design methods.		The student knows how to design basic installations and systems for recovering energy and raw materials from waste.		[SU3] Assessment of ability to use knowledge gained from the subject		
	[K6_K01] makes decisions independently, conducts a critical assessment of his own actions and the actions of the teams he manages, assuming responsibility for the effects of these actions.		The student is able to make decisions independently, both individually and in a team, and is able to critically evaluate these decisions.		[SK3] Assessment of ability to organize work [SK1] Assessment of group work skills		
	[K6_U05] plans, prepares and conducts engineering activities in the field of raw materials and energy recovery, applying practical knowledge and understanding of the specificity of materials, devices and tools, processes and technologies.		The student is able to use the acquired engineering knowledge and is able to apply it in practice		[SU1] Assessment of task fulfilment [SU4] Assessment of ability to use methods and tools		
	[K6_W03] identifies problems and phenomena related to the recovery of raw materials and energy as well as applicable concepts, standards and design methods and is aware of their limitations.		The student is able to identify problems related to the recovery of energy and raw materials from waste and is aware of the application of methods to their limitations.		[SW2] Assessment of knowledge contained in presentation [SW3] Assessment of knowledge contained in written work and projects		

Subject contents	Course content – project 1. Definition of RDF alternative fuel 2. Definition of preRDF alternative fuel 3. Production of RDF from waste 4. Waste sorting for RDF production 5. Shredding and drying of combustible fractions 6. Formation of the final RDF fuel 7. Study visit to an RDF production facility 8. Technological design including a flowchart, mass balance, heat balance, and cost of producing 1 ton of RDF		
Prerequisites and co-requisites	The student understands issues related to unit processes such as: - selection and segregation of raw materials obtained from waste - grinding - drying - forming into the final form Additionally, the student has knowledge of thermodynamics, heat of combustion, and fuel heat		
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
	technological project	100.0%	40.0%
	oral presentation	100.0%	20.0%
	final test	60.0%	40.0%
Recommended reading	Basic literature		1. W. Lewandowski - Techniczno-technologiczne i aparaturowe aspekty ochrony powietrza, Wydawnictwo PG, Gdańsk 2011. 2. J. Piotrowski - Pomiary, Wydawnictwo WNT, Warszawa 2012. 3. PG Library Resources - especially waste management: https://pg.edu.pl/biblioteka-pg/e-zasoby/bazy-danych - List of databases and resources of the PG Library's periodicals and books
	Supplementary literature		Industry magazines such as: Municipal Review, Municipal Technology, Energy and Recycling
	eResources addresses		

Example issues/ example questions/ tasks being completed	1. What is preRDF? 2. How to calculate the heating value? 3. Name three methods for crushing materials. 4. How to estimate the cost of producing 1 ton of RDF. 5. How to determine the moisture content of preRDF and RDF.
Practical activities within the subject	Not applicable

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