Course name:

Environmental impact assessment on Waste Management investition

ECTS	**3**
Course status	**complementary**
Course final assessement/evaluation of outcomes	**exam**
Prerequisites	**passing the subject: Waste recovery engineering**

Main field of study:

Renewable Energy Sources and Waste Management

Profile of study	**General-academic**
The code of studies (education level)	**SM (master)**
Semester of studies	**summer**
Language of instruction	**English**

Course offered by:

Name of faculty offering the course	**Faculty of Production and Power Engineering**
Name of department offering the course	**Department of Bioprocesses Engineering, Energetics and Automatization**
Course coordinator	**Mateusz Malinowski, PhD**

Learning outcomes of the course:

Symbol of outcome	Description of learning outcome	Reference to	
		main field of study outcomes	discipline#
KNOWLEDGE – student knows and/or understands:			
OOG_W1	legal and economic (non-technical) conditions of engineering activities, especially regarding proceedings of environmental impact assessment of waste management projects	OZE2_W03	TZ
OOG_W2	methods for life cycle assessment of the equipment, facilities and technical systems used for waste management	OZE2_W08	TZ
SKILLS – student is able to:			
OOG_U1	calculate the emission of noise, dust, etc. impacts on the environment, solve them by carrying out simple computer simulations, interpret the obtained results and draw conclusions	OZE2_U10	TZ
OOG_U2	using the LCA method, assess the advantages and disadvantages of engineering activities in the field of waste management	OZE2_U12	TZ
OOG_U3	prepare the ecological evaluation of the selected area, make a critical analysis of the functioning systems and assess the existing technical solutions used for waste management	OZE2_U15	TZ
SOCIAL COMPETENCE- student is ready to:			

OOG_K1	aware of social, professional and ethical responsibility for the state of the natural environment (is aware of the risk and can assess the effects of the business activity)	OZE2_K06	TZ

Teaching contents:

Lectures	**15 hours**
Topics of the lectures	Current legal status in the scope of environmental impact assessment (EIA) and issuing decisions and environmental conditions (EU directives and national legislation) The procedure of environmental impact assessment and decisions on environmental conditions. An overview of sample documentation in the field of environmental impact assessment of facilities for waste management Scope of the Information Card on the Project and the Environmental Impact Assessment Report Basic and extended methods for assessing the environmental impact of investments in the field of waste management Noise and electromagnetic radiation, waste management and sewage disposal, odorant emission, methods of protection against harmful influence of external factors Public participation in the environmental impact assessment, Environmental risk assessment IPPC, BAT, BREF, and ISO documentation in the environmental impact assessment
Accomplished learning outcomes	*OOG_W1, OOG_W2, OOG_K1*
Verification methods, rules and criteria of outcome assessment	*Single choice test (50%)*

Classes	**20 hours**
Topics of the classes	Noise, dust and odorous in waste management - project Ecological life cycle assessment of selected variants of the project affecting the environment in the field of waste management - a project carried out in 2-person teams in the SimaPro program or equivalent to LCA Ecological evaluation of the selected commune - individual project covering a review and asset of the current state of the environment in the commune, in the aspect of preparing an environmental impact assessment report for investment
Accomplished learning outcomes	*OOG_U1, OOG_U2, OOG_U3, OOG_K1*
Verification methods, rules and criteria of outcome assessment	*Preparation of 3 different projects and demonstration of practical skills - passing projects (50%)*

References:

Basic	*Papageorgiou, A., Karagiannidis, A., Barton, J.R., and Kalogirou, E. (2009). Municipal solid waste management scenarios for Attica and their greenhouse gas emission impact. Waste Management and Research 27, 928–937 ISO. Environmental Management—Life Cycle Assessment—Principles and Framework; ISO 14040:2006; CEN (European Committee for Standardisation): Brussels, Belgium, 2006. ISO. Environmental Management—Life Cycle Assessment—Requirements and Guidelines; ISO 14044:2006; CEN (European Committee for Standardisation): Brussels, Belgium, 2006.*
Supplementary	*Grzesik, K., Malinowski, M. (2017). Life Cycle Assessment of Mechanical–Biological Treatment of Mixed Municipal Waste. Environmental Engineering Science 34 (3), 207-220*

Structure of learning outcomes:

Discipline: mechanical engineering # (*TZ*)				*3*	ECTS**
Structure of student activities:					
Contact hours		40	hours	1,6	ECTS**
including:	lectures	15	hours		
	classes and seminars	20	hours		
	consultations	3	hours		
	participation in research	…	hours		
	mandatory trainerships	…	hours		
	participation in examinations	2	hours		
e-learning		…	hours	…	ECTS**
student own work		35	hours	1,4	ECTS**

*** where 10 hours of classes = 1 ECTC (in case of 15 h → 2 ECTS)**

** stated with an accuracy to 0.1 ECTS, where 1 ECTS = 25 - 30 hours of classes

academic discipline code: RZ - animal science and fishery, PB - biological sciences, etc.