

Nazwa przedmiotu: <b>Technologies beyond today</b> Technologie przyszłości		
Field of study: <b>Environmental Engineering</b>		
Type of study: <b>Erasmus</b>	The level of education: <b>2-MSc</b>	Code: <b>0712</b>
Type of subject: <b>obligatory</b>	Semester <b>30S</b>	Course language: <b>English</b>
Course type: <b>seminar</b>	Number of hours: <b>30</b>	ECTS Credit points: <b>2</b>

## SYLLABUS

### COURSE OBJECTIVES

- C.1. The student knows modern solutions in industries related to energy management
- C.2. The student knows modern solutions in industries related to energy management
- C.3. The student is able to characterize new solutions used in industry in selected industries

### PRELIMINARY COURSE REQUIREMENTS FOR KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knowledge of the basics of innovation in industry, trends, innovative changes in the industry.
2. Ability to use professional literature.
3. Competence in indicating modern research methods, new materials, and non-technological innovations.

### SUBJECT EDUCATIONAL EFFECTS

- EU 1. The student has elementary knowledge of innovation in industry.
- EU 2. The student knows modern solutions in the field of energy production and storage and in other energy management industries.
- EU 3. The student is able to characterize new solutions used in industry in selected industries.

### COURSE CONTENT

Form of classes – seminary	Hours
The student is able to characterize new solutions used in industry in selected industries.	5
Modern research and diagnostic methods used in industry (non-destructive analysis methods and destructive methods) - overview and discussion for presentation.	5
Modern materials and techniques of their production used in industry (nanomaterials, composites) - overview and discussion for the presentation.	5
A modern solution used in selected industries - renewable energy, engineering and environmental protection, medicine, pharmaceuticals, IT, transport - overview and discussion for presentation.	5

Modern non-technical innovative solutions used in industry - logistic solutions, legal acts, modern management methods, didactic methods - overview and discussion for presentation.	5
Discussing presentations based on information from selected industrial and energy facilities	3
Assessment of the presentation.	2

### COURSE STUDY METHODS

1. interactive whiteboard
2. e-learning platform

### METHODS OF ASSESMENT ( F – formative, S – summative)

F1. – activity in classes
F2. - presentations

### STUDENT WORKLOAD

Form of activity	Workload (hours)
Participation in lectures	-
Participation in classes	-
Laboratory	-
Participation in project classes	-
Participation in seminar	30 h
Preparation course on e-learning	-
Test	-
Entrance test for laboratory classes	-
Project's defence	-
Exam	-
Consultation hours	2 h
<b>DIRECT TEACHING, hours/ ECTS</b>	<b>32 h /1 ECTS</b>
Preparation for tutorials	-
Preparation for laboratories	-
Preparation for projects	-
Preparation for seminars	10 h
Preparation for e-learning classes	-
Participation in e-learning classes	-
Working on project	-
Preparation for tests	2 h
Preparation for exam	-
<b>SELF-STUDY, hours/ ECTS</b>	<b>12 h / 1 ECTS</b>
<b>TOTAL (hours)</b>	<b>Σ 44 h</b>
<b>TOTAL ECTS</b>	<b>2 ECTS</b>

### PRIMARY AND SUPPLEMENTARY TEXTBOOKS

1. R. Kozłowski, A. Sikorski, Nowoczesne rozwiązania w logistyce, wyd. II, Oficyna
--

Wolters Kluwer, 2013

2. K. Borodako, J. Berbeka, M. Rudnicki, Zarządzanie innowacjami w przemyśle spotkań,  
Wydawnictwo C.H. Beck, 2018

3. Literatura branżowa i artykuły naukowe

**SUBJECT COORDINATOR (NAME, SURNAME, E-MAIL ADDRESS)**

1. dr inż. Renata Włodarczyk renata.wlodarczyk@pcz.pl

**NAME OF LECTURER (s) (NAME, SURNAME, E-MAIL ADDRESS)**

1. dr inż. Renata Włodarczyk renata.wlodarczyk@pcz.pl

<b>Learning outcome</b>	<b>In relation to the learning outcomes specified for the field of study</b>	<b>Course objectives</b>	<b>Course content</b>	<b>Course study methods</b>	<b>Methods of assessment</b>
<b>EU1</b>	K_W09, K_W16, K_K02	<b>C1</b>	W1-W10	1, 2	F2, P1
<b>EU2</b>	K_W09, K_W16, K_K02	<b>C2</b>	W10-W15	1, 2	F1, P1
<b>EU3</b>	K_W09, K_W16, K_K02	<b>C3</b>	C1-C15	1,2	F2

**OTHER USEFUL INFORMATION**

1. All the information on the class schedule is posted on the student information board and online at: [www.is.pcz.pl](http://www.is.pcz.pl)
2. The information about the consultation hours is provided to students on the first class meeting and posted online at Instytutu Inżynierii Środowiska
3. The information on course completion and grade is provided to students on the first class meeting.