

FACULTY OF ELECTRICAL
ENGINEERING**SUBJECT CARD**

Name in Polish: **Regulacje prawne i inwestycje w energetyce o strukturze rozproszonej**
 Name in English: **Legal Regulations and Investments in Power Systems with Distributed Energy Sources**
 Main field of study (if applicable): **Electrical Engineering**
 Specialization (if applicable): **Renewable Energy Systems**
 Level and form of studies: **2nd level, full-time**
 Kind of subject: **obligatory**
 Subject code: **ELR042537**
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	30				15
Number of hours of total student workload (CNPS):	60				30
Form of crediting:	crediting with grade				crediting with grade
For group of courses mark (X) final course:					
Number of ECTS points:	2				1
including number of ECTS points for practical (P) classes :					1
including number of ECTS points for direct teacher-student contact (BK) classes:	1.40				0.70

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Knows the principles a power system operation and control, is familiar with electricity generation and transmission techniques.
2. Has sufficient range of language means at his/her disposal to relatively flawlessly speak out (orally and written), formulate and justify opinions, explain his/her position, show advantages and disadvantages of different solutions, participate in discussion and present general, scientific and technical subject matter.
3. Can use basic hardware and software, create and edit a text on basic level, create computer presentations.
4. Understands a need and knows possibilities of continuous education, increasing of professional, personal and social competences.
5. Has awareness of responsibility for own work.

SUBJECT OBJECTIVES

- C1. Getting to know national and union legal regulations in the field of utilization of renewable energy sources.
- C2. Getting to know principles of well-balanced development.
- C3. Possession a knowledge of energy and heat markets in aspect of renewable energy sources.
- C4. Possession a knowledge of investment processes in renewable distributed generation.
- C5. Acquisition of abilities to analyze legal, technical and economical aspects of construction of distributed and dispersed generation objects using renewable energy sources.
- C6. Acquisition of abilities to design investments in distributed and dispersed generation.
- C7. Acquisition of abilities to assess support mechanisms for investment of distributed and dispersed generation using renewable energy sources.

SUBJECT EDUCATIONAL EFFECTS	
<i>relating to knowledge:</i>	
PEK_W01	Knows national and union legal regulations in the field of utilization of renewable energy sources.
PEK_W02	Possession a knowledge of energy and heat markets in aspect of renewable energy sources.
PEK_W03	Knows investment processes in renewable distributed generation.
<i>relating to skills:</i>	
PEK_U01	Can analyze legal, technical and economical aspects of construction of distributed and dispersed generation objects using renewable energy sources.
PEK_U02	Can design investments in distributed and dispersed generation.
PEK_U03	Can assess support mechanisms for investment of distributed and dispersed generation using renewable energy sources.
<i>relating to social competences:</i>	
PEK_K01	Can think and act in creative and enterprising way. He/she is able to rank appropriately the priorities needed for realizing the respective task.

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	The fundamentals of creating of legal regulations in the field of utilization of renewable energy sources.	2
Lec 2	The Union legal regulations in the field of utilization of renewable energy sources (documents of the European Union).	2
Lec 3	National legal regulations in the field of utilization of renewable energy sources (national documents).	2
Lec 4	Review of legal regulations in area of renewable energy sources in selected countries of the European Union and in the world.	2
Lec 5	Review of applied support mechanisms of development of renewable energy sources.	2
Lec 6	National support mechanism in range of utilization of energy from renewable sources.	2
Lec 7	Principles of well-balanced development and natural compensation and expansion of distributed and dispersed generation using renewable energy sources.	2
Lec 8	Energy and heat markets in aspect of renewable energy sources.	2
Lec 9	Formal and legal requirements for planning of construction of objects using renewable energy sources.	2
Lec 10	Connection of renewable energy sources to the electric power grid.	2
Lec 11	Formal and legal requirements connected with construction and modernization of power network infrastructure.	2
Lec 12	Financial requirements for construction of objects using renewable energy sources.	2
Lec 13	Preliminary study of investments using renewable energy sources in distributed generation.	2
Lec 14	Example projects of investments in area of renewable energy sources.	2
Lec 15	Test.	2
Total hours:		30

Form of classes - seminar		Number of hours:
Sem 1	The Union legal regulations in the field of utilization of renewable energy sources.	2
Sem 2	National legal regulations in the field of utilization of renewable energy sources.	2
Sem 3	Formal and legal regulations for using renewable energy sources in different countries of the European Union.	2
Sem 4	Support mechanisms for investment of distributed generation using renewable energy sources and electricity and heat markets.	2
Sem 5	Completion of preliminary study of investment for selected objects of distributed generation using renewable energy sources.	2
Sem 6	Guidelines for dealing with investors that plan to construct objects of distributed generation using renewable energy sources.	2
Sem 7	Technological systems using renewable energy sources for the environment and legal regulations in this field.	2
Sem 8	Repetition and summing up.	1
Total hours:		15

TEACHING TOOLS USED	
N1.	Lecture with the use of audiovisual techniques, multimedia presentations.
N2.	Multimedia presentation.
N3.	Problem discussion.
N4.	Case study.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation <i>F – forming (during semester) P – concluding (at semester end)</i>	Educational effect number	Way of evaluating educational effect achievement
F1(w)	PEK_W01 PEK_W02 PEK_W03 PEK_K01	Test.
P(w)	P=F1	
F1(s)	PEK_U01 PEK_U02 PEK_U03	Activity on seminar classes.
F2(s)	PEK_U01 PEK_U02 PEK_U03	Preparing and presenting a presentation.
P(s)	P=0.2*F1+0.8*F2	

PRIMARY AND SECONDARY LITERATURE
<p>PRIMARY LITERATURE:</p> <p>[1] Dyrektywa 2009/28/WE Parlamentu Europejskiego i Rady z dnia 23 kwietnia 2009 r. w sprawie promowania stosowania energii ze źródeł odnawialnych zmieniająca i w następstwie uchylająca dyrektywy 2001/77/WE oraz 2003/30/WE (Dz.Urz. WE L 140 z 5.06.2009).</p> <p>[2] Dyrektywa 2009/72/WE Parlamentu Europejskiego i Rady z 13 lipca 2009 dotycząca wspólnych zasad rynku wewnętrznego energii elektrycznej i uchylająca dyrektywę 2003/54/WE (Dz.U. UE L 211z 14.08.2009).</p> <p>[3] Ustawa z dnia 10 kwietnia 1997 r. – Prawo Energetyczne (Dz. U. z 2006 r. Nr 89, poz. 625 z późn.zm.).</p> <p>[4] Ustawa z dnia 20 lutego 2015 r. o odnawialnych źródłach energii (Dz. U. z 2015 r. poz. 478).</p> <p>[5] Kowalska A., Wilczyński A., Źródła rozproszone w systemie elektroenergetycznym. Wydawnictwo Kaprint, Lublin, 2007.</p> <p>[6] Lewandowski W., Proekologiczne źródła energii odnawialnej. WNT, Warszawa, 2008.</p> <p>SECONDARY LITERATURE:</p> <p>[1] Rozporządzenia Ministra Gospodarki dotyczące funkcjonowania sektora elektroenergetycznego</p> <p>[2] Boyle G., Renewable Energy – Power for a sustainable future, Second Edition, Oxford University Press Inc. New York, 2004.</p>

SUBJECT SUPERVISOR
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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT
ELR042537 - Legal Regulations and Investments in Power Systems with Distributed Energy Sources
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**
AND SPECIALIZATION **Renewable Energy Systems**

Subject educational effect	Correlation between subject educational effect and educational effects defined for main field of study and specialization (if applicable)	Subject objectives	Programme content	Teaching tool number
PEK_W01	S2RES_W12	C.1 C.2	Lec1 Lec2 Lec3 Lec4 Lec7 Lec9 Lec11 Lec15	N.1
PEK_W02	S2RES_W12	C.3	Lec5 Lec6 Lec8 Lec15	N.1
PEK_W03	S2RES_W12	C.4	Lec9 Lec10 Lec11 Lec12 Lec13 Lec14 Lec15	N.1
PEK_U01	S2RES_U12	C.5	Sem1 Sem2 Sem3 Sem4 Sem5 Sem6 Sem7 Sem8	N.2 N.3 N.4
PEK_U02	S2RES_U12	C.6	Sem4 Sem5 Sem6 Sem7 Sem8	N.2 N.3 N.4
PEK_U03	S2RES_U12	C.7	Sem4 Sem5 Sem6 Sem8	N.2 N.3 N.4
PEK_K01	K2ETK_K06	C.3 C.4 C.5 C.6 C.7	Lec13 Lec14 Lec15 Sem5 Sem6 Sem7 Sem8	N.1 N.2 N.3 N.4