

FACULTY OF ELECTRICAL  
ENGINEERING**SUBJECT CARD**

Name in Polish: **Sterowanie obciążeniami elektrycznymi**  
 Name in English: **Load management**  
 Main field of study (if applicable): **Electrical Engineering**  
 Specialization (if applicable): **Electrical Power Engineering**  
 Level and form of studies: **2nd level, part-time**  
 Kind of subject: **obligatory**  
 Subject code: **ELR042574**  
 Group of courses: **NO**

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU):	22				
Number of hours of total student workload (CNPS):	81				
Form of crediting:	crediting with grade				
For group of courses mark (X) final course:					
Number of ECTS points:	3				
including number of ECTS points for practical (P) classes :					
including number of ECTS points for direct teacher-student contact (BK) classes:	2.10				

**PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES**

1. The student has mastered a basic knowledge on electrical engineering (active and reactive power, active and reactive energy, power compensation, power factor, voltage, current).
2. The student can properly and effectively apply the principles and laws of physics in the qualitative and quantitative analysis of physical aspects of engineering.
3. The student understands and knows the need for continuous training opportunities and improves their professional competence.

**SUBJECT OBJECTIVES**

- C1. To acquaint students with the demand management.  
 C2. To acquaint students with the knowledge on electrical tariffs and tariff policy.  
 C3. A student will acquire practical knowledge and skills of efficient, rational and efficient use of electricity.

**SUBJECT EDUCATIONAL EFFECTS***relating to knowledge:*

- PEK\_W01 The student has mastered knowledge on principles of saving energy, energy efficiency and rational use of energy.  
 PEK\_W02 He has knowledge of the importance and methods of formulation of the loads.  
 PEK\_W03 The student has knowledge on a tariff policy.

*relating to skills:**relating to social competences:*

- PEK\_K01 The student is aware of the need for economical and rational use of energy.

PROGRAMME CONTENT		
Form of classes - lecture		Number of hours:
Lec 1	Presentation of the course, requirements and a method of assessment, description of definitions of key concepts.	1
Lec 2	Presentation of the structure of the polish energy sector, discuss the principles of the functioning of energy markets.	1
Lec 3	Presentation of: EU energy policy, the Polish energy policy, EU directives on rationalization of electricity, Energy Efficiency Act etc.	3
Lec 4	Analysis of load charts (load shape), analysis of a power ordered.	1
Lec 5	Energy management - methods, energy management tools.	2
Lec 6	Saving electricity - from design to use.	2
Lec 7	Energy management in an enterprise.	1
Lec 8	A reactive power in a power system, loss of electricity.	1
Lec 9	Rational use of electricity in industrial company and households.	1
Lec 10	Programs DSR, a tariff's policy, a role of tariffs in the DSM - the impact of tariffs.	3
Lec 11	The use of smart grid in the field of electricity load shaping.	4
Lec 12	Final test	2
Total hours:		<b>22</b>

TEACHING TOOLS USED
N1. Informative lecture, multimedia presentations.

EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT		
Evaluation <i>F - forming (during semester)</i> <i>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	

PRIMARY AND SECONDARY LITERATURE
<b>PRIMARY LITERATURE:</b> [1] Billewicz K., Smart Metering. Inteligentny system pomiarowy. Warszawa, PWN 2011. [2] Billewicz K., Smart Grids - inteligentne sieci elektroenergetyczne. IMD Anna Korba, 2015, cz. 1, cz. 2. [3] Wilczyński A., Systemy taryfowe jako narzędzia ekonomicznego sterowania zapotrzebowaniem na moc i energię elektryczną. Prace Naukowe Instytutu Energoelektryki, Politechnika Wrocławska, seria monografie nr 85 (25), Wrocław 1990. [4] Malko J., Wilczyński A.: Oszczędne, racjonalne czy efektywne użytkowanie energii elektrycznej. Energetyka 9/2007, s. 607-612. [5] Wilczyński A., Racjonalne użytkowanie energii w przedsiębiorstwie. [w] Racjonalność w funkcjonowaniu organizacji: gospodarkaspoleczeństwo, Oficyna Wydawnicza PWSZ w Nysie, 2009, ss.80-93 <b>SECONDARY LITERATURE:</b> [1] DYREKTYWA PARLAMENTU EUROPEJSKIEGO I RADY 12/27/UE z dnia 25 października 2012 r. w sprawie efektywności energetycznej, zmiany dyrektyw 2009/125/WE i 2010/30/UE oraz uchylenia dyrektyw 2004/8/WE i 2006/32/WE [2] Ustawa o efektywności energetycznej z dnia 15 kwietnia 2011 r., Dziennik Ustaw Nr 94/5569, poz., 551. [3] Ustawa Prawo energetyczne z dnia 10 kwietnia 1997 Dr.z.U. z 1997 r. Nr 54, poz. 348, z późniejszymi zmianami.

SUBJECT SUPERVISOR
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MATRIX OF CORRELATION BETWEEN EDUCATIONAL EFFECTS FOR SUBJECT  
**ELR042574 - Load management**  
AND EDUCATIONAL EFFECTS FOR MAIN FIELD OF STUDY **Electrical Engineering**  
AND SPECIALIZATION **Electrical Power Engineering**

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	S2EEN_W01 S2EEN_W10	C.1 C.2 C.3	Lec1 Lec2 Lec4 Lec6 Lec7 Lec8 Lec9	N.1
PEK_W02	S2EEN_W01 S2EEN_W10	C.1 C.3	Lec4 Lec5 Lec7 Lec8 Lec9 Lec10 Lec11	N.1
PEK_W03	S2EEN_W01 S2EEN_W10	C.2	Lec3 Lec10	N.1
PEK_K01	K2ETK_K03	C.1 C.3	Lec1 Lec3 Lec6 Lec7 Lec9 Lec10 Lec12	N.1