

FACULTY OF MECHANICAL AND POWER ENGINEERING					
SUBJECT CARD					
<b>Name of subject in Polish:</b>	Biopaliwa i paliwa alternatywne				
<b>Name of subject in English:</b>	Biofuels and alternative fuels				
<b>Main field of study (if applicable):</b>	Power Engineering				
<b>Specialization (if applicable):</b>	Renewable Sources of Energy				
<b>Profile:</b>	academic				
<b>Level and form of studies:</b>	2nd level, full-time				
<b>Kind of subject:</b>	optional-specialization				
<b>Subject code:</b>	W09ENG-SM0049				
<b>Group of courses:</b>	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 final course with (X)					
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 (BU) classes	1	0,75			

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

Competence in the field of thermodynamics, combustion and fuels confirmed positive assessments of the 1st degree courses of study.

**SUBJECT OBJECTIVES**

C1 – familiarize students with problems related to the use of biomass energy and alternative fuels.

C2 – systematization of knowledge in the use of biomass and alternative fuels

C3- familiarize students to the calculations of combustion equipment and biomass and alternative fuels gasification.

**SUBJECT LEARNING OUTCOMES**

relating to knowledge:

PEU\_W01 has a systematic knowledge of the use of biomass and alternative fuels energy

relating to skills:

PEU\_U01 can perform calculations for combustion and gasification of biomass and alternative fuels devices

**PROGRAM CONTENT**

Lectures		Number of hours
Lec 1	Polish energy policy for the use of biofuels and alternative fuels;	2
Lec 2	Properties, types of classification and production of biofuels and alternative fuels;	2
Lec 3	Solid biofuels as an energy source;	2

Lec 4	Wood, agricultural waste, energy crops, second generation biomass;	2
Lec 5	Alternative fuels as an energy source	2
Lec 6	Municipal waste, sewage sludge, industrial waste and other waste;	2
Lec 7	Combustion of biofuels and alternative fuels and assessment of their quality;	2
Lec 8	Conversion processes - chemical and biochemical conversion; thermochemical (gasification, pyrolysis);	2
Lec 9	Electricity generation and cogeneration - low power systems using biofuels and alternative fuels;	2
Lec 10	Low power heating systems using biofuels and alternative fuels;	2
Lec 11	Heating and industrial boilers for solid biofuels and alternative fuels;	2
Lec 12	Electricity generation and cogeneration - high power systems using biofuels and alternative fuels;	2
Lec 13	Co-combustion of coal with biofuels and alternative fuels;	2
Lec 14	Environmental aspects related to the use of biofuels and alternative fuels;	2
Lec 15	Crediting with grade;	2
	Total hours	<b>30</b>
<b>Classes</b>		<b>Number of hours</b>
C1–C7	The calculation of biofuel and alternative fuels combustion and thermal calculations and carrying devices to combustion and gasification of biomass alternative fuels	13
Cl 8	Crediting with grade	2
	Total hours	<b>15</b>
<b>TEACHING TOOLS USED</b>		
N1. Lecture: multimedia presentation combined with a form of traditional		
N2. classes: oral answer		
N3. consultations		

#### **EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT**

<b>Evaluation</b> (F – forming (during semester), P – concluding (at semester end))	<b>Learning outcomes number</b>	<b>Way of evaluating learning outcomes achievement</b>
P	PEU_W01	Control work
P	PEU_U01	Control work

#### **PRIMARY AND SECONDARY LITERATURE**

##### **PRIMARY LITERATURE:**

[1] Rybak W. Spalanie i współspalanie biopaliw stałych, Wydawnictwa Politechniki Wrocławskiej, 2006

##### **SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)**

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