Z1-PU7	WYDANIE N1	Strona 1 z 1

(*faculty stamp*)

COURSE DESCRIPTION

1. Course title: RENEWABLE ENERGY SOURCES	**2. Course code**
3. Validity of course description: from 2014/2015	
4. Level of studies: BA, BSc programme / MA,MSc programme lub 1st cycle / 2nd cycle of higher education	
5. Mode of studies: intramural studies / extramural studies	
6. Field of study: POWER ENGINEERING	(FACULTY SYMBOL) RIE
7. Profile of studies: : overall academic/ ~~practical~~	
8. Programme: SUSTAINABLE ENERGY ENGINEERING	
9. Semester: 6	
10. Faculty teaching the course: Institute of Power Engineering and Turbomachinery	
11. Course instructor: dr inż. Sebastian Lepszy	
12. Course classification: directional subjects/~~subjects of specialization other~~[1]	
13. Course status: compulsory /~~elective~~	
14. Language of instruction: English;	
15. Pre-requisite qualifications: English knowledge on B1 level, basics of thermodynamics, fluid mechanics, heat transfer, turbomachinery	
16. Course objectives: Presentation of knowledge on the use of renewable energy sources for the generation of heat and electricity	

17. Description of learning outcomes:

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Mastering knowledge of the characteristics of renewable energy sources	test	lecture	K1A_W18
2.	Mastering knowledge of the construction, principles and characteristics of systems using renewable energy sources	test	lecture	K1A_W18 K1A_W19
3.	Ability to carry out analyzes related to assessment of parameters describing renewable energy resources	Laboratory report / test	laboratory	K1A_U24
4.	Ability to assess the characteristics of systems using renewable energy sources	Laboratory report / test	laboratory	K1A_U24
5.				

18. Teaching modes and hours

Lecture 15/ Laboratory 15

19. Syllabus description:

Lecture: Characteristics of renevable energy sources (solar radiation, wind energy, geothermal energy, water energy and biomass energy). Construction, principle of operation and characteristics of systems using renewable energy sources.

Laboratory: Measurements and analysis of meteorological parameters. Measurement of the characteristics of photovoltaic cells. Monitoring system of building heat pump. Measurement of biomass properties. Characteristics of wind turbine. Characteristics of water turbine.

20. Examination: no

21. Primary sources:

Mayer Kutz: Environmentally conscious alternative energy production. John Wiley & Sons, Inc.,2007
Letcher T. M.: Future Energy: Improved, Sustainable and Clean Options for our Planet,. Elsevier 2008

22. Secondary sources:

T. Chmielniak: Technologie energetyczne. WNT, Warszawa 2008
M. Lewandowski: Proekologiczne źródła energii odnawialnej, WNT, Warszawa 2002.

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	15/15
2	Classes	/
3	Laboratory	15/15
4	Project	/
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	30/30

24. Total hours:60

25. Number of ECTS credits: 2

26. Number of ECTS credits allocated for contact hours: 1

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 1

26. Comments:

Approved:

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(date, Instructor's signature)

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(*date , the Director of the Faculty Unit signature)*