

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: Waste management and thermal waste utilization		2. Course code		
3. Validity of course description: from 2012/2013				
4. Level of studies: BSc programme				
5. Mode of studies: intramural studies				
6. Field of study: POWER ENGINEERING		(FACULTY SYMBOL)		
7. Profile of studies: general academic				
8. Programme: Sustainable power engineering				
9. Semester: VI				
10. Faculty teaching the course: Power and environmental engineering				
11. Course instructor: Prof. Jan Nadziakiewicz				
12. Course classification: speciality course				
13. Course status: compulsory				
14. Language of instruction: English				
15. Pre-requisite qualifications: thermodynamics, heat transfer, methods of measurement				
16. Course objectives: To learn the basic information on the waste management and utilization				
17. Description of learning outcomes:				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Knows technologies of environment protection in the power sector	Written test	Lecture	K_W15
2.	Knows the energy assessment LCA method dealing with the raw materials exploitation	Written test	Lecture	K_W19
3.	Knows how to determine the emission from power systems	Project report	Project	K_U20
4.	Understands the renewable energy analysis methods	Project report	Project	K_U24
5.	Understands the importance of non-technical effects of engineering activity	Written test	Lecture	K_K02
6.				
7.				
8.				
18. Teaching modes and hours				
Lecture: 30h				
Project: 15h				
19. Syllabus description:				
Lecture				
<ol style="list-style-type: none"> 1. Systems of waste management 2. Sorting and segregation of waste 3. Recycling of products, materials and energy from waste 4. Thermal methods of waste utilization 5. Municipal solid waste management 6. Hazardous waste management 7. Co-combustion of waste and fuel from waste 				

Project:

1. Analysis of MSW composition and properties.
2. Analysis of collecting and sorting system.
3. Recovery of materials and energy from the waste.
4. Composition and properties of fuel from waste.

20. Examination: Written test + Project elaborate**21. Primary sources:**

Nadziakiewicz J., Waclawiak K., Stelmach S.: Procesy termiczne utylizacji odpadów. Wyd Pol. Śl.Gliwice 2012.
 Williams P.T. Waste treatment and disposal: Wiley and Sons.
 Termochemiczne przetwórstwo węgla i biomasy. Praca zbiorowa Instytutu Chemicznej Przeróbki Węgla. Zabrze 2008.

22. Secondary sources:

Bilitewski B., Hardtke G., Marek K.: Podręcznik gospodarki odpadami. Seidel-Przywecki. Warszawa 2003.
 Tilman D.A., Harding N.S.: Fuels of Opportunity: Characteristics and uses in combustion systems. Elsevier 2004.
 Wandrasz J., Wandrasz A.: Paliwa formowane. Zeidel-Przywecki . Warszawa 2006.

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/15
2	Classes	/
3	Laboratory	/
4	Project	15/30
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	45/45

24. Total hours: 90**25. Number of ECTS credits: 3****26. Number of ECTS credits allocated for contact hours: 2****27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2****26. Comments: No comments**

Approved:

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 (date, Instructor's signature)

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 (date , the Director of the Faculty Unit signature)