

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: Thermal utilization of wastes		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 energy engineering				
9. Semester: V				
10. Faculty teaching the course: Power and environmental engineering				
11. Course instructor: Prof. Jan Nadziakiewicz				
12. Course classification: common course				
13. Course status: compulsory				
14. Language of instruction: English				
15. Pre-requisite qualifications: : thermodynamics, heat transfer, methods of measurement				
16. Course objectives: Knowledge of specific parameters of thermal methods of waste 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	Laboratory report	Laboratory	K_U20
4.	Understands the renewable energy analysis methods	Laboratory report	Laboratory	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				
Laboratory: 15h				
19. Syllabus description:				
<ol style="list-style-type: none"> 1. Basics of combustion and chemical engineering 2. Thermal methods of waste utilization 3. Municipal solid waste management 4. Hazardous waste management 5. Co-combustion of waste and fuel from waste 6. Waste gasification 7. Waste pyrolysis 				

Laboratory: 1. Measurement of calorific value of waste 2. Measurement of composition of waste 3. Measurement of thermal parameters of waste incineration. 4. Measurement of emission from thermal processes.
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	15/30
4	Project	/
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)