(*faculty stamp*)

COURSE DESCRIPTION

1. Course title: Emission and transport of air pollutants,	**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: Faculty of Energy 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: Mathematics, Thermodynamics, Fluid mechanics	
16. Course objectives: Knowledge of importance of emission control and dispersion in the environment	
17. Description of learning outcomes:	

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Knows basic relations of technical and chemical thermodynamics and heat transfer and flow mechanics	Written test	Lecture	K_W13
2.	Knows measurement methods of thermal parameters in power engineering	Written test	Lecture	K_W14
3.	Knows the basic technologies of environment protection in power engineering	Written test	Lecture	K_W15
4.	Can built the models of technical processes and make analysis and simulations	Project report	Project report	K_U11
5.	Can determine the emission of harmful substances to the environment from power installations	Project report	Project report	K_U20
6.	Understands the importance of non-technical and environmental effects of engineering processes	Written test	Lecture	K_K02
7.				
8.				

18. Teaching modes and hours

Lecture: 15 h

Project: 30 h

19. Syllabus description:

Lecture:

1. Gas concentration and emission
2. Emission standards
3. Methods of emission measurement
4. Composition of atmosphere
5. Atmospheric dispersion
6. Emission - Pasquille model
7. Air pollution monitoring

Project:

1. Calculation of emission of pollutants from the combustion process.
2. Comparing the emission with emission standards for particlular fuel and boiler installation.
3. Calculation of pollutant dispersion from the given emitter and geographical localization.
4. Calculation the imissio in the emitter surrounding.

20. Examination: Theory test + Project elaborate

21. Primary sources:

1. Zanetti P.:Air pollution modeling. Van Noostrand Reinhold.. New York.
2. Gurjar B.R., Molina L.T., Ojha C.S.: Air pollution.. Health and Environmental Impacts. CRC Press.
3. Orzechowski Z., Prywer J., Zarzycki R.: Mechanika Płynów w Inżynierii Środowiska. WNT. Warszawa.

22. Secondary sources:

1. Tilman D.A., Harding N.S.: Fuels of Opportunity: Characteristics and uses in combustion systems. Elsevier 2004.
2. 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	15/30
2	Classes	/
3	Laboratory	/
4	Project	30/30
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	45/60

24. Total hours: 105

25. Number of ECTS credits: 4

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