

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 3

1. Course title: SUSTAINABLE DEVELOPMENT PRINCIPLES AND ENVIRONMENTAL OPTIMIZATION IN POWER ENGINEERING		2. Course code		
3. Validity of course description: 2012/2013				
4. Level of studies: BA, BSc programme / MA, MSc programme or 1 st cycle / 2 nd 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: academic				
8. Programme: Alternative Power Technologies and environmental management				
9. Semester: 2				
10. Faculty teaching the course: Chair of Technologies and Installations for Waste Management				
11. Course instructor: dr hab. inż. Krzysztof Pikoń				
12. Course classification: speciality course				
13. Course status: compulsory / elective				
14. Language of instruction: English				
15. Pre-requisite qualifications: -				
16. Course objectives: Education in the field of environmental protection: <ul style="list-style-type: none"> • Sustainability; • legal and economic aspects of environmental protection • the concept of clean technologies. Training in environmental technologies <ul style="list-style-type: none"> • Legal aspects of the use of best available techniques used to protect the environment. • Comparison of different industries nuisance for the main components of the environment. • The best available technique in thermal power generation based on non-renewable energy sources. • Analysis of equal fuel and combustion equipment for their impact on the environment. The use of renewable energy sources. • Analysis of best available technologies in selected industries - determining their impact on the environment. • The environmental impact assessment of selected raw materials sourcing technology. • Analysis of the results drawn from activities carried out in the green industrial plants. Selection of the best technology in terms of the impact on the environment.				
17. Description of learning outcomes:				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Student has a basic knowledge of management, including management of quality, and business	test	lecture	K_W03
2.	has specialized knowledge to solve problems related to the specialty of study	test	project	K_W17

3.	Is able to obtain information from literature, databases and other carefully selected sources, also in English, integrating the information, making their interpretation, drawing conclusions and formulating and justifying opinions	test	lecture	K_U01
4.	Is able to prepare in Polish and in a foreign language a well-documented technical report	report	project	K_U03
5.	Is able to assess the usefulness and the usability of new developments (techniques and technologies) in the energy	report	project	K_U11
6.	can perform an extended analysis of the impact of selected process parameters on its efficiency and effectiveness / energy efficiency	test	lecture	K_U22
7.	Is able to assess the impact of technical solutions related to the specialty of study	Test / report	Lecture/project	K_U26
8.	Is aware of the importance and understanding of the effects of non-technical aspects and engineering activities, including its impact on the environment, and consequently the responsibility for decisions	report	project	K_K02

18. Teaching modes and hours

Lecture / 15 BA/MA Seminar / Class / Project / 30 Laboratory

19. Syllabus description:

Lecture

Course is dedicated to the Life Cycle Assessment. During the lectures issues related to environmental impact of various process is discussed. Those processes comprise production, use and disposal of products. The methodology of environmental burden assessment as well as energy and environmental analysis in the full life cycle of products is given. The practical applications of LCA studies are presented.

Project

During the course, students will do a project with the following thematic scope:

- The CBA, CEA and LCA.
- Environmental impact of waste to energy systems.
- Ecological and economic aspects of energy production.

20. Examination: YES

21. Primary sources:

- Jan Górczyński, Podstawy analizy środowiskowej wyrobów i obiektów, WNT 2007
- Witold M. Lewandowski, Proekologiczne odnawialne źródła energii, WNT 2008
- Małgorzata Górczyk, Zygmunt, Joanna Kulczycka, Ekologiczna ocena cyklu życia procesów wytwórczych LCA, PWN 2007

22. Secondary sources:

- Guy Garrod Economic Valuation of the Environment, Methods and Case Studies, EE Publishing 1999,
- Hanley N., Splash C.L., Cost Benefit Analysis and the Environment – EE Publishing 1993

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	15/25
2	Classes	/
3	Laboratory	/
4	Project	30/50
5	BA/ MA Seminar	/
6	Other	/
	Total number of hours	45/75

24. Total hours: 120
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): 3
26. Comments:

Approved:

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(date, Instructor's signature)

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(date, the Director of the Faculty Unit signature)