(faculty stamp)

COURSE DESCRIPTION

1. Course title: WATER TREATMENT FOR INDUSTRIAL PURPOSES	**2. Course code**
3. Validity of course description: 2012/2013	
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: Environmental Engineering	(FACULTY SYMBOL)
7. Profile of studies: general	
8. Programme: Technology of water, wastewater and soil	
9. Semester: 6	
10. Faculty teaching the course: Institute of Water and Wastewater Engineering	
11. Course instructor: dr inż. Barbara Pieczykolan	
12. Course classification: subject of the specialization	
13. Course status: compulsory /elective	
14. Language of instruction: English	
15. Pre-requisite qualifications: chemia, technologia wody, ochrona środowiska, mechanika płynów	
16. Course objectives: The main objective of the course is to provide water treatment processes for industrial purposes	
17. Description of learning outcomes:	

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Has knowledge of industrial water treatment technology depending on the origin, characteristics of water quality and customer requirements	test	Lecture	KIA_W10 KIA_W20 KIA_W21 KIA_W26
2.	Has a basic knowledge of the individual water treatment processes designed for industrial purposes	test	Lecture	KIA_W09 KIA_W10 KIA_W20 KIA_W21 KIA_W26
3.	Can do experiments and determine the parameters of the individual processes used in the technological water treatment system for industrial purposes	Test; report	Laboratory	KIA_U04 KIA_U14 KIA_U15 KIA_U17 KIA_K03
4.	Uses knowledge of the general principles of operation and equipment selection in the study of pre-technological system for water treatment for industrial purposes	Test; report	Laboratory	KIA_U22 KIA_U23 KIA_U25 KIA_U26 KIA_K01 KIA_K03
5.	Can plan technological system of water treatment for industrial purposes with specified quality parameters of water	Test; report	Laboratory	KIA_U08 KIA_U11 KIA_U26 KIA_U29 KIA_K01 KIA_K03
6.				

7.				
8.				

18. Teaching modes and hours

Lecture – 15 h / BA /MA Seminar / Class / Project / Laboratory – 45 h

19. Syllabus description:

Lecture:
Quality requirements of water for cooling purposes and boiler systems. Decarbonation, softening by chemical methods, softening and demineralization using ion-exchange methods, deoxidation, stabilization.
Laboratory:
Qualitative analysis of the water used for industrial purposes. Chosen water purification unit processes such a: decarbonisation, water softening by chemical methods, water softening using ion-exchange methods, deoxidation, stabilization

20. Examination: Test

21. Primary sources:

1. Hermanowicz W., Dojlido J. i inni: Fizyczno-chemiczne badanie wody i ścieków. Wyd. Arkady, Warszawa 1999.
2. Kowal A. L., Świderska-Bróż M.: Oczyszczanie wody. Wyd. Naukowe PWN. Warszawa-Wrocław 1996.
3. Nawrocki J., Biłozor S.: Uzdatnianie wody. Procesy chemiczne i biologiczne. Wyd.PWN. Warszawa 2000.
4. Praca zbiorowa: Laboratorium z Technologii Wody. Wyd. Pol. Śl. Skrypt nr 1937. Gliwice 1995, Wyd. II.
5. Sierakowski E., Mrożek J.: Kontrola wody i pary w energetyce. Wyd. ZPBE Energopomiar. Gliwice 1998.

22. Secondary sources:

23. Total workload required to achieve learning outcomes

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

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): 2

26. Comments:

Approved: DYREKTOR INSTYTUTU Inżynierii Wody i Ścieków

30.09.2015r. prof. dr hab. Jolanta Bohdziewicz

(date, Instructor's signature)

(date , the Director of the Faculty Unit signature)