DESCRIPTION OF THE COURSE OF STUDY

Course code	**0531-2CHEM-C17-CSiZC**	
Name of the course in	Polish	***Chemia Stosowana i Zarządzanie chemikaliami***
	English	***Applied Chemistry and Chemicals Management***

1. LOCATION OF THE COURSE OF STUDY WITHIN THE SYSTEM OF STUDIES

1.1. Field of study	**chemistry**
1.2. Mode of study	**full-time studies/extramural studies**
1.3. Level of study	**graduate studies**
1.4. Profile of study*	**general**
1.5. Person/s preparing the course description	**Walentyna Zubkowa**
1.6. Contact	**walentyna.zubkowa@ ujk.edu.pl**

2. GENERAL CHARACTERISTICS OF THE COURSE OF STUDY

2.1. Language of instruction	**English**
2.2. Prerequisites*	**Basics of Chemistry**

3. DETAILED CHARACTERISTICS OF THE COURSE OF STUDY

3.1. Form of classes		**Lecture: 30 hrs**
3.2. Place of classes		**Classes at the UJK facilities**
3.3. Form of assessment		**Lecture: exam (test)**
3.4. Teaching methods		**Lecture, discussion (problem solving)**
3.5. Bibliography	**Required reading**	Nawrocki J., 2010. Uzdatnianie wody. Procesy fizyczne, chemiczne i biologiczne. PWN, Warszawa; Siemieńska T., Szczeponek K., Turek A., Pronieiwcz L., 2008. Gospodarka odczynnikami chemicznymi w placówkach naukowo-oświatowych. WUJ, Kraków; Rosik-Dulewska C., 2000. Podstawy gospodarki odpadami. PWN, Warszawa.
	Further reading	Przondo J., 2010. Związki powierzchniowo czynne i ich zastosowanie w produktach chemii gospodarczej. Wydawnictwo Politechniki Radomskiej, Monografia Nr 143; Biziuk M., 2001. Pestycydy, występowanie, oznaczanie i unieszkodliwianie. WNT, Warszawa; Sikorski Z.E., 2007. Chemia Żywności. Praca zbiorowa T 2-3, WNT, Warszawa; Osiecka E., 2005. Materiały budowlane. Tworzywa sztuczne. Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa.

4. OBJECTIVES, SYLLABUS CONTENT AND INTENDED LEARNING OUTCOMES

4.1. Course objectives *(including form of classes)*

C1. The main objective of teaching is the acquisition of skills in applying the principles of sustainable development of in everyday life by the stude

C2. Introduction into the principles of management of chemical reagents.

4.2. Detailed syllabus *(including form of classes)*

Lecture

The tasks of applied chemistry in the light of sustainable development. The methods of purification, treatment, and use of water for municipal, consumer, and industrial purposes (boiler water, water for cooling purposes). The management of chemical reagents: the principles of classification and labelling of chemical substances. Material safety data sheets. Classification and division of wastes. Recycling of selected wastes. The principles of neutralization and utilization of chemicals. Household wastes: the principles of segregation, utilization, and recycling. Processing of household wastes. Detergents – the use and impact on environment. Pesticides – classification, toxicity criteria, disposal. Food additives. Building materials – protection during use, waste management. Processing of renewable raw materials (selected root crops, cereals, oilseeds, rubber).

4.3 Intended learning outcomes

Code	A student, who passed the course	Relation to learning outcomes
within the scope of **KNOWLEDGE:**		

W01	knows the principles of classification and labelling of chemical substances	CHEM1A_W04
W02	knows the rules of conduct with chemical wastes	CHEM1A_W13
W03	knows how chemical reagents are obtained from renewable raw materials	CHEM1A_W13
within the scope of **ABILITIES:**		
U01	can make the right choice of water treatment methods	CHEM1A_U06 CHEM1A_U05
U02	can segregate and dispose wastes	CHEM1A_U05
U03	can determine the threats resulting from improper use and storage of detergents and pesticides	CHEM1A_U09
within the scope of **SOCIAL COMPETENCE:**		
K01	is aware of the impact of pollution on the condition of natural environment and human health	CHEM1A_K02

4.4. Methods of assessment of the intended learning outcomes

Teaching outcomes *(code)*	**Method of assessment (+/-)**														
	Exam ~~oral~~ /written*			**~~Test*~~**			**~~Project*~~**			**~~Group work*~~**			**~~Others* e.g. standardized test used in e-learning~~**		
	Form of classes			***~~Form of classes~~***			***~~Form of classes~~***			***~~Form of classes~~***			***~~Form of classes~~***		
	L	*C*	...	~~*L*~~	~~*C*~~	~~...~~	~~*L*~~	~~*C*~~	~~...~~	~~*L*~~	~~*C*~~	~~...~~	~~*L*~~	~~*C*~~	...
W01	+														
W02	+														
W03	+														
U01	+														
U02	+														
U03	+														
K01	+														

****delete as appropriate***

4.5. Criteria of assessment of the intended learning outcomes

Form of classes	**Grade**	**Criterion of assessment**
Lecture (L) * (including e-learning)	**3**	Exam : the student must earn at least 60% of the total points
	3,5	Exam : the student must earn at least 66% of the total points
	4	Exam : the student must earn at least 76% of the total points
	4,5	Exam : the student must earn at least 86% of the total points
	5	Exam : the student must earn at least 96% of the total points

5. BALANCE OF ECTS CREDITS – STUDENT'S WORK INPUT

Category	**Student's workload**	
	Full-time studies	**Extramural studies**
NUMBER OF HOURS WITH THE DIRECT PARTICIPATION OF THE TEACHER /CONTACT HOURS/	***30***	
*Participation in lectures**	***30***	
*Participation in classes, seminars, laboratories**		
*Preparation in the exam/final test**		
*Others**		
INDEPENDENT WORK OF THE STUDENT/NON-CONTACT HOURS/	***20***	
*Preparation for the lecture**		
*Preparation for the classes, seminars, laboratories**		
*Preparation for the exam/test**	***20***	
*Gathering materials for the project/Internet query**		
Preparation of multimedia presentation		
*Others**		
TOTAL NUMBER OF HOURS	***50***	
ECTS credits for the course of study	***2***	

****delete as appropriate***

Accepted for execution *(date and legible signatures of the teachers running the course in the given academic year)*