(*faculty stamp*)

COURSE DESCRIPTION

1. Course title: FINE CHEMICALS	**2. Course code**
3. Validity of course description: 2017/2018	
4. Level of studies: 2nd cycle of higher education	
5. Mode of studies: intramural studies	
6. Field of study: INDUSTRIAL AND ENGINEERING CHEMISTRY	(FACULTY SYMBOL) RCH5
7. Profile of studies: academic	
8. Programme: Nanomaterials and Fine Chemicals	
9. Semester: II	
10. Faculty teaching the course: Department of Organic Chemical Technology and Petrochemistry	
11. Course instructor: Beata Orlińska, PhD, DSc, associate professor	
12. Course classification: specialization	
13. Course status: compulsory	
14. Language of instruction: English	
15. Pre-requisite qualifications: General technology	
16. Course objectives: The aim of the course it to present currently used methods for fine chemicals production.	

17. Description of learning outcomes:

Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	Student has knowledge about selected industrial methods of fine chemicals production	Test Oral presentation	Lecture Seminar	K_W03+ K_W05++
2.	Student has knowledge about current tendency in fine chemicals manufacture	Test Oral presentation	Lecture Seminar	K_W07++
3.	Student can perform chemical reactions in laboratory scale, elaborate obtained results and prepare written report	Report	Laboratory	K_W01+ K_U09++ K_U06++
4.	Student can evaluate experimental results	Report	Laboratory	K_U18+
5.	Student is fluent in English	Oral presentation Report	Seminar Laboratory	K_U03++
6.	Student has ability to work in team	Observation	Laboratory	K_U02+
7.	Student can properly use natural resources in the chemical industry, aimed at the principles of environmental protection and sustainable development	Test Oral presentation Discussion	Lecture Seminar	K_U12+
8.	Student behaves professionally, represents a high moral and ethical level in relation to social and professional problems	Discussion Observation	Laboratory Seminar	K_K03+ K_K04+

18. Teaching modes and hours

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

Lec 15 h / Lab 75 h / Sem 15 h

19. Syllabus description:

Lecture :

1. Fine chemicals characterization
2. Dyes – clasiffication, production, application
3. Surfactants - clasiffication, production, application
4. Cosmetics chemistry – types of cosmetic emulsions, composition of cosmetic emulsions
5. Alternative solvents in fine chemicals synthesis
6. Catalysis in fine chemicals synthesis

Laboratory :

1. Dyes – synthesis of selected azo dyes and their application in dyeing processes (wool, cotton)
2. Surfactants - synthesis of selected surfactants and determination of basic properties
3. Cosmetics chemistry – preparation of cosmetic emulsions O/W and W/O
4. Catalytic oxidation processes in fine chemicals synthesis – examples of catalytic oxidation processes using various oxidizing agents and catalysts
5. Ionic liquids – synthesis and application as solvents
6. Phase transfer catalysis – application in fine chemicals synthesis
7. Esterification – synthesis of selected fragrances

Seminar :

1. Vitamines production
2. Ibuprom, naproxen production
3. Fragrances
4. UV filters
5. Active ingredients of cosmetics

20. Examination: No

21. Primary sources:

1. Ullmann's Encyclopedia of Industrial Chemistry, VCH
2. Kirk Othmer Encyclopedia of Chemical Technology, Wiley
3. P. Pollack, Fine Chemicals: The Industry and the Business, Wiley, 2011
4. D.F. Williams, W.H. Schmitt, Chemistry and Technology of the Cosmetics and Toiletries Industry", Blackie Academic & Proffessional, New York 1996.
5. R.A. Sheldon, H. van Bekkum, Fine Chemicals through Heterogeneous Catalysis, Wiley-VCH, 2001
6. J. Hagens, Industrial Catalysis, Wiley, 2006

22. Secondary sources:

1. P. Wasserscheid, T. Welton, Ionic Liquids in Synthesis, Wiley-VCH: Weinheim, 2007
2. N.G. Anderson, Practical Process Research and Development, Academic Press, New York, 2000.
3. Scientific papers

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	15/15
2	Classes	/
3	Laboratory	75/75
4	Project	/
5	BA/ MA Seminar	15/15
6	Other	/
	Total number of hours	105/105

24. Total hours:210

25. Number of ECTS credits: 7

26. Number of ECTS credits allocated for contact hours: 3,5

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects): 2,5

26. Comments:

Approved:

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(date, Instructor's signature) (*date , the Director of the Faculty Unit signature)*