

(faculty stamp)

COURSE DESCRIPTION

Z1-PU7

WYDANIE N1

Strona 1 z 2

1. Course title: SEPARATION PROCESSES		2. Course code		
3. Validity of course description: 2015/2016				
4. Level of studies: BA, BSc programme / MA, MSc programme or 1 st cycle / 2 nd cycle of higher education				
5. Mode of studies: <u>intramural studies</u> / extramural studies				
6. Field of study: CHEMICAL TECHNOLOGY AND ENGINEERING		(FACULTY SYMBOL) (RCH)		
7. Profile of studies: academic				
8. Programme: SPECIALTY MATERIALS AND FINE CHEMICALS; PROCESS ENGINEERING FOR GREEN CHEMICAL TECHNOLOGIES				
9. Semester: VI				
10. Faculty teaching the course: Department of Chemical and Process Engineering				
11. Course instructor: Janusz WÓJCIK, DSc, PhD				
12. Course classification:				
13. Course status: <u>compulsory</u> / elective				
14. Language of instruction: English				
15. Pre-requisite qualifications: Unit Operations, Physical Chemistry				
16. Course objectives: gaining skills of description mass transfer processes during diffusional and extractional unit operations. These abilities allow to perform calculation of fundamental balances and design of absorber, distillation and extraction column				
17. Description of learning outcomes:				
Nr	Learning outcomes description	Method of assessment	Teaching methods	Learning outcomes reference code
1.	He/She knows three-component equilibria and can interpret them	exam	lecture	K_W07++ , K_U03++ , K_U08++
2.	He/She knows means of extraction solvent choice, type of operation and dimensioning of main apparatus sizes	exam	lecture	K_W12+++ , K_U03+++ , K_U07+++
3.	He/She knows the newest applications of extraction, leaching and supercritical extraction	exam	lecture	K_W08+++ , K_U03+++
4.	He/She can solve typical extraction problems	test	class	K_U03+++ , K_U24+++
5.	He/She can design of absorber	design/project	laboratory	K_U03++ , K_U05+++ , K_U07++
6.	He/She can design of distillation column	design/project	laboratory	K_U03++ , K_U05+++ , K_U07++
18. Teaching modes and hours				
Lecture / BA /MA Seminar / Class / Project / Laboratory				
L30, CI15, L30				
19. Syllabus description:				
Semester 6 :				
L. After an introduction to the problems of solvent extraction, leaching and supercritical extraction there are detailed consideration of the next topics: liquid equilibria, prediction of the distribution, choice of solvent and solvent recovery, methods of calculation of stagewise contact ternary systems with one solvent, continuous countercurrent contact, laboratory equipment, pilot				

plant gathering data, Apparatus, equipment for stagewise contact, equipment for differential - continuous contact, some extractor economics, liquid extraction processes; petroleum refining; fat, oil and similar processes; coke-oven processes; pharmaceuticals; inorganic processes; leaching, supercritical extraction. Problems of diffusion and mass transfer are only noted for remembrance of previous subjects from Transport Phenomena.

Cl. problems connected with lectures

L absorber and distillation column design

20. Examination: semester 6

21. Primary sources:

Diran Basmadjian, *Mass Transfer*, CRC Press, 2004; R. E. Treybal, *Liquid extraction*, Mc Graw-Hill, 1963; T. C. Lo, M. H. I. Bird, C. Hanson, *Handbook of Solvent Extraction*, John Wiley, 1983;

22. Secondary sources:

R. D. Noble, P. A. Terry, *Principles of Chemical Separations with Environmental Applications*, Cambridge U. P., 2004; E. L. Cussler, *Diffusion, Mass Transfer In Fluid Systems*, Cambridge U. P., 2003

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	30/10
2	Classes	15/10
3	Laboratory	30/25
4	Other	15/15
	Total number of hours	90/60

24. Total hours:150

25. Number of ECTS credits: 5

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

27. Number of ECTS credits allocated for in-practice hours (laboratory classes, projects):1

26. Comments:

Approved:

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(date, Instructor's signature)

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(date, the Director of the Faculty Unit signature)