(facul	ty stamp) COURSE DESCRIF	PTION	Z1-PU7	WYDANIE N1	Strona 1 z 2	
1. C	ourse title: MODERN POLYMERS AND PLASTICS	2	2. Course code			
3. Va	alidity of course description: 2017/2018					
4. Le	evel of studies: 2 nd cycle of higher education					
5. M	ode of studies: intramural studies					
6. Fi	Field of study: INDUSTRIAL ENGINEERING CHEMISTRY (FACULTY SYMBOL) RCH4					
7. Pi	Profile of studies: general					
8. Pi	ogramme: NANOMATERIALS AND FINE CHEMICAI	S				
9. Se	emester: 2					
10. F	aculty teaching the course: Department of Physica	I Chemistry and Technolo	ogy of Polyme	rs (RCh-4)		
11. (Course instructor: Izabela Barszczewska-Rybarek, I	OSc, PhD				
12. (Course classification: specialization					
13. (Course status: compulsory					
14. L	anguage of instruction: English					
15. F	Pre-requisite qualifications: Organic Chemistry					
16. 0	Course objectives: The aim of the course is to provide	information about plastic cla	assifications, p	roperties, process	sing and applications.	
Man	y issues focus on structure-property-application relatior	ships. Common as well as a	advanced poly	mers are concern	ed.	
17. [Description of learning outcomes:					
Nr	Learning outcomes description	Method of assessmen	t Tea	ching methods	Learning outcomes	
1.	Student knows the main groups of plastics and their	Written examination	lecture		K_W12(2)	
2.	Student knows the basic methods of plastics	Written examination	lecture		K_W04(1), K_W07(3),	
3	processing Student has knowledge about the modern plastics	Written examination	lecture		K_W12(2), K_U11(3),	
J.	with specific properties	Whiten examination	lecture		N_WON(2), N_020(2)	
4.	Student can perform the modification of macromolecules and is able to interpret the obtained results	Report Written test	laborator	у	K_U08(2), K_U10(3), K_U17(1), K_U18(2)	
5.	Student knows how to follow the rules and SAFETY when performing experimental work	Safety Training	laborato	у	K_W11(2), K_U15(2), K_K05(2)	
6.	Student can use the test standards that specify the basic properties of plastics	Oral presentation	seminar		K_U01(2), K_U06(1)	
18. T	eaching modes and hours					
Lect	ure / BA /MA Seminar / Class / Project / Laboratory					
Lec -	Lec - 45 h, Sem - 15 h, Lab – 75h					
19. 5	19. Syllabus description:					
Lect Pres	.ectures: Presentation of majority of modern polymers: chemical structure, basic properties and applications. Classifications of plastics, by chemical					

Presentation of majority of modern polymers: chemical structure, basic properties and applications. Classifications of plastics, by chemical structure, production scale and properties. Plastic modifications, leading to advanced properties and applications (copolymers, polymer blends and alloys). Plastics additives. Modern methods of polymer processing. Polymers in specialty applications: liquid crystalline polymers, biodegradable polymers and plastics, polymeric biomaterials, polymer networks, including interpenetrating polymer networks, silicones, polyurethanes.

Laboratory:

Synthesis and characterization of epoxy resins based on diglycidyl ether of bisphenol A. Preparation of epoxy varnish and amine epoxide hardener. Application of epoxy coatings and investigation of their properties. Manufacturing and characterization of epoxy casts and laminates. Determination of glass transition temperature of cured epoxy resins. Determination of melt flow index of thermoplastics. Investigation of poly(vinyl chloride) plasticization effect. Preparation of poly(methyl methacrylate) bone cement. Preparation of polylactide scaffold.

Seminars:

Students give short presentations about plastic properties based on international standards.

20. Examination: yes

21. Primary sources:

- 1. C.A.Harper, E.M.Petrie, Plastics Materials and Processes, Wiley, Hoboken 2003.
- 2. R.B.Seymour, G.S.Kirshenbaum (Eds.), High Performance Polymers: Their Origin and Development, Elsevier, New York 1986.
- 3. J.E.Fried, Polymer Science and Technology, Prentice hall PTR, New Yersey 1995.
- 4. F.Meuser, D.J.Manners, W.Seibel (Eds.), Plant Polymeric Carbohydrates, Royal Society of Chemistry, Cambridge 1993.
- 5. C.Bastioli (Ed.), Handbook of Biodegradable Polymers, Rapra Technology Ltd., Shawbury 2005.
- 6. E.Chiellini et al. (Eds.) Biorelated Polymers, Sustainable Polymer Science and Technology, Kluwer Academic, New York 2001.

22. Secondary sources:

Scientific publications related to the theme of the activities.

International test standards.

23. Total workload required to achieve learning outcomes

Lp.	Teaching mode :	Contact hours / Student workload hours
1	Lecture	45 / 45
2	Classes	
3	Laboratory	75 / 75
4	Project	1
5	BA/ MA Seminar	15 / 15
6	Other	1
	Total number of hours	135 / 135
24. Tota	hours:270	
25. Nun	ber of ECTS credits: 9	
26. Nun	ber of ECTS credits allocated for contact hours:	5
27. Nun	ber of ECTS credits allocated for in-practice hou	rs (laboratory classes, projects): 3
26. Con	iments:	

Approved:

(date, Instructor's signature)

(date , the Director of the Faculty Unit signature)