

。 GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	, PG_00058695								
Field of study	Materials Engineering, Materials Engineering								
Date of commencement of studies	February 2024		Academic year of realisation of subject		2023/2024				
Education level	second-cycle studies		Subject group		Optional subject group Subject group related to scientific research in the field of study				
Mode of study	Full-time studies		Mode of delivery			at the university			
Year of study	1		Language of instruction			Polish			
Semester of study	1		ECTS credits			3.0			
Learning profile	general academic profile		Assessment form		assessment				
Conducting unit	Department of Polymer Technology -> Faculty of Chemistry								
Name and surname	Subject supervisor		dr inż. Maciej Sienkiewicz						
of lecturer (lecturers)	ecturers) Teachers		dr inż. Maciej Sienkiewicz dr hab. inż. Justyna Kucińska-Lipka Edyta Piłat dr inż. Marcin Włoch mgr inż. Przemysław Gnatowski						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Projec	t	Seminar	SUM	
	Number of study hours	30.0	0.0	15.0	0.0		0.0	45	
	E-learning hours included: 0.0								
Learning activity and number of study hours	Learning activity Participation in classes include plan		i didactic Participation in ed in study consultation hours		Self-study		SUM		
	Jumber of study 45 Jours		5.0		25.0		75		
Subject objectives	The goal of the course is to give the knowledge in the field of the basic groups of the polymer binders and processes for their production, the processes of drying of coatings and the types and functions of additives used in the production of paints and varnishes.								

Learning outcomes	Course outcome	Subject outcome	Method of verification				
	K7_W06	The student knows the theoretical basis of the operation of scientific apparatus in the field of material engineering, including in particular the apparatus using for obtaining and testing the properties of varnish products and polymer coatings	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects				
	K7_U01	The student knows the source databases, how to use them and implement the acquired data in the preparation of a report or project	[SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task				
	K7_U04	The student knows the basic methods, techniques, tools and materials used in solving complex engineering tasks in the field of material engineering	[SU1] Assessment of task fulfilment [SU2] Assessment of ability to analyse information [SU3] Assessment of ability to use knowledge gained from the subject [SU4] Assessment of ability to use methods and tools [SU5] Assessment of ability to present the results of task				
	K7_W05	The student knows the basic methods, techniques, tools and materials used in solving complex engineering tasks in the field of engineering and technology of coating materials	[SW1] Assessment of factual knowledge [SW3] Assessment of knowledge contained in written work and projects				
Subject contents	Characteristics of natural film-forming substances - technology of their production and properties. Characteristics of synthetic film-forming substances - technology of their production and properties Film-forming curing systems - technology of their production and properties Polycondensation film-forming systems - manufacturing and properties Solutions or dispersions of film-forming substances. Physicochemical and thermodynamic properties.						
	Pigmentation and dyeing of paints and varnishes. Additives used in the production of paints and varnishes. Innovative solutions in the world of paints and varnishes.						
Prerequisites and co-requisites	There is no requirement						
Assessment methods	Subject passing criteria	Passing threshold	Percentage of the final grade				
and criteria	lecture	60.0%	60.0%				
		160.0%	40.0%				
Recommended reading	Basic literature	 Goldschmidt A., Streitberger H.J., Basf handbook on Basic of coating technology, BASF Coatings AG, Münster, Vincentz Network, Hannower 2003 Brock T., Groteklaes M., Mischke P., European Coatings Handbook, Curt R. Vincentz Verlag, Hannover 2000 Stoye D., Paints, Coatings and solvents, Verlagsgesellschaft mbH, Weinheim 1993 European Coatings, http://www.european-coatings.com/ Coatings World, http://www.coatingsworld.com/news/ Rynek Farb, http://www.rynekfarb.pl/ 					

	Supplementary literature	 Wilson A.D., Nicholson J.W., Prosser H.J., Surface Coatings, Elsevier, London 1987, Davison G., Lane B., Additives in Water-borne Coatings, Royal Society of Chemistry (Great Britain), 2003 Marrion A.R., The Chemistry and Physics of Coatings, Royal Society of Chemistry (Great Britain), 2003 Licari, J.J., Coating Materials for Electronic Applications - Polymers, Processes, Reliability, Testing, William Andrew Publishing/Noyes, 2003 Florio J.J., Calbo L.J., Miller D.J., Handbook of Coatings Additives, Marcel Dekker; New York 2004 Tracton A.A., Satas D., Coatings Technology Handbook, Marcel Dekker, Inc. USA 2001 Pappas S.P., Wicks Z.W., Jones F.N., Wicks D.A., Organic Coatings: Science and Technology (Society of Plastics Engineers Monographs) Wiley, John & Sons, Incorporated, USA, 2007 Lambourne, R.; Strivens, T.A., Paint and Surface Coatings - Theory and Practice, Woodhead Publishing, 1999 Bieleman J., Additives for Coatings, Wiley-Vch Verlag GmbH, Weinheim, 2000 Wypych G., Handbook of Fillers - A Definitive User's Guide and Databook, ChemTec Publishing, 2000 					
	eResources addresses	Adresy na platformie eNauczanie: 2024-Polimerowe Materiały Powłokotwórcze - wykład/laboratorium - semestr letni 2023/2024 - Moodle ID: 36963 https://enauczanie.pg.edu.pl/moodle/course/view.php?id=36963					
Example issues/ example questions/ tasks being completed	 Describe the processes of physical drying, oxidation drying and chemical drying of coatings. Classification of oils according to their tendency to dry. 						
	 The process of preparing capon varnishes. Describe the process starting from basic raw materials. Characterize the polyurethane coatings with blocked polyisocyanate and polyurethane coatings cured by moisture. Describe the reactions and a process for preparing glyptale or pentanale. Describe the advantages and disadvantages of coatings obtained from glyptale or pentanale. 						
	 6. Write a general reaction scheme of curing the epoxy coatings and describe the method of calculating the amount of hardener required for cross-linking of these products. 7. Give examples of acrylic monomers which are used in the production of film-forming polyacrylates. What defines the main application properties of acrylic resins, as binders. 						
	8. Fillers, definition, role in the coatings, what is SOP (PVC).						
	9. Solvent, definition, role in the coatings, how the solvent content affects to the classification of coatings, what it is and how define of VOC (VOC) in solvent-based coatings.						
	 10. Pigments and dyes, give the differences, the principle of their operation in the coatings and varnish, (wh they staining). 11. Describe the techniques of coatings production. 						
	12. Characterise the methods of test	ing the properties of liquid and cured coatings.					
Work placement	Not applicable						

Document generated electronically. Does not require a seal or signature.