Course code	
Type and description	Background Course
ECTS credit	2
Course name	World Trends in Materials Engineering
Course name in Polish	Światowe trendy w inżynierii materiałowej
Language of instruction	English
Course level	8 PRK
Course coordinator	prof. dr hab. inż. Kula Piotr
Course instructors	dr hab. inż. Zbigniew Draczyński, prof. uczelni
Delivery methods and course duration	

	Lecture	Tutorials	Laboratory	Project	Seminar	Other	Total of teaching hours during semester
Contact hours	15					0	15
E-learning	No	No	No	No	No	No	
Assessment criteria (weightage)	0,00					0,00	

Course objective	The aim of the course is: 1. Introduce PhD to the world trends in materials engineering. 2. Enable students to acquiring knowledge of new trends in the field of engineering polymer materials.
Learning outcomes	PhD student is able; 1. Describe the state of art and world trends in Materials Engineering, W1 2. Define basic mechanical properties of engineering materials. W1 3. Define methods for molding of engineering materials properties W1 4. Classify polymers used in material engineering with regard to chemical structure, their physicochemical properties and processing capabilities. – effects - U3
Assessment methods	Verification methods of learning outcomes effects W1 P8S_EG, U1 P8S_UW2. 4- final conversation The final grade consists of: The result of the final conversation - 100%
Prerequisites	
Course content with delivery methods	LECTURE 1. Etymology of “engineering materials” and importance of it for modern technology, 2. Basic definition of engineering materials: metals, ceramic, polymers, composites, 3. Development trends in individual groups of engineering materials 4. The significance of metallic materials in the contemporary development of technology 5. 2D materials, graphene morphological forms and methods of production 6. Potential areas of graphene applications 7. Trends in the development of materials for the automotive industry 8. Trends in the development of materials for aircraft industry 9. Basic knowledge in the field of macromolecular compounds. 10. Polymers in a condensed state. 11. Degradation of macromolecular compounds. 12. Configuration of the macromolecule. The size and shape of the macromolecule. 13. Polymer solutions. Polydispersity of polymers. Functions of molecular weight distribution. 14. Innovative techniques of processing polymeric materials
Basic reference materials	1. The lecturer's material. 2. Blicharski M.: Wstęp do inżynierii materiałowej. WNT, Warszawa, 1998. 3. Połowiński S.: Chemia fizyczna polimerów, Wydawnictwo Politechniki Łódzkiej, Łódź, 2001 r.

	4. Praca zbiorowa, Chemia polimerów, tom I-III, Oficyna Wydawnicza Politechniki Warszawskiej, Warszawa 1997 r.
Other reference materials	1. Kula P.: Inżynieria warstwy wierzchniej. Monografia PŁ, Łódź, 2000 2. Guy A.G., "Wprowadzenie do nauki o materiałach", PWN 1977 3. Przybyłowicz K., "Podstawy teoretyczne metaloznawstwa", WNT Warszawa 1999
Average student workload outside classroom	20
Comments	
Last update	