GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Thermodynamics, PG_00039797		
Field of study	Materials Engineering, Materials Engineering, Materials Engineering, Materials Engineering		
Date of commencement of studies	October 2020	Academic year of realisation of subject	2021/2022
Education level	first-cycle studies	Subject group	Obligatory subject group in the field of study
Mode of study	Full-time studies	Mode of delivery	at the university
Year of study	2	Language of instruction	Polish
Semester of study	4	ECTS credits	5.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Physical Chemistry -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Dorota Warmińska	
	Teachers	dr inż. Paulina Rakowska dr hab. inż. Dorota Warmińska	

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	30.0	0.0	30.0	0.0	0.0	60

E-learning hours included: 0.0

Adresy na platformie eNauczanie:

Learning activity and number of study hours

Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours	Self-study	SUM
Number of study hours	60	5.0	60.0	125

Subject objectives

The aim of the subject is familiarizing the students with fundamentals of thermodynamic analysis of physico-chemical systema, esp. those including chemical equilibria and phase equilibria.

Learning outcomes

Course outcome	Subject outcome	Method of verification
K6_U06	The student can describe and analyze physicochemical systems from thermodynamic point of view, especially chemical and phase equilibria.	[SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information
K6_K01	The students understand the need expanding their knowledge and are aware of their own limitations.	[SK3] Assessment of ability to organize work [SK5] Assessment of ability to solve problems that arise in practice
K6_W02	The student is able to use knowledge in mathematics, physics and chemistry for thermodynamic description.	[SW1] Assessment of factual knowledge

Subject contents

Laws of thermodynamics. Thermochemistry and calorimetry. State functions. Equations of state. Chemical equilibria. Phase equilibria in single and multicomponent systems. Phase diagrams.

Prerequisites and co-requisites

Knowledge of mathematics, physics and chemistry at BSc level.

Assessment methods and criteria

Subject passing criteria	Passing threshold	Percentage of the final grade
written exam	50.0%	50.0%
performing 5 experiments and delivering the reports	100.0%	50.0%

Recommended reading	Basic literature	1. Chemia fizyczna. P.W.Atkins, PWN 2. Chemia fizyczna.1.Podstawy fenemenologiczne. K.Pigoń i Z.Ruziewicz, PWN 3. Chemia fizyczna. Ćwiczenia laboratoryjne. Red.: H.Strzelecki i W.Grzybkowski, Wydawnictwo PG
	Supplementary literature	1. Wykłady z chemii fizycznej (praca zbiorowa). Wydawnictwo NT 2. Chemia fizyczna. 2.Fizykochemia molekularna. K.Pigoń i Z.Ruziewicz, PWN 3.Eksperymentalna chemia fizyczna.Red.: H.Strzelecki, Wydawnictwo PG 4. Podstawy termodynamiki. H. Buchowski, W. Ufnalski, Wydawnictwo NT 5. Gazy, ciecze, płyny. H. Buchowski, W. Ufnalski, Wydawnictwo NT
	eResources addresses	
Example issues/ example questions/ tasks being completed	Define and discuss the concept of thermodynamic equilibrium. Discuss the concepts of specific heat at constant volume and constant pressure. Derive a general relationship between them and give its physical meaning. Apply the results obtained to perfect gas. Discuss the relationships between thermodynamic potentials U (V, S), H (S, p), F (V, T), G (p, T). Formulate, drive and discuss the Gibbs phase rule.	
Work placement	Not applicable	