GDAŃSK UNIVERSITY OF TECHNOLOGY

Subject card

Subject name and code	Clinical Analytics, PG_00047874		
Field of study	Biomedical Engineering, Biomedical Engineering, Biomedical Engineering		
Date of commencement of studies	October 2022	Academic year of realisation of subject	2024/2025
Education level	first-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	3	Language of instruction	Polish
Semester of study	6	ECTS credits	3.0
Learning profile	general academic profile	Assessment form	exam
Conducting unit	Department of Chemistry and Technology of Functional Materials -> Faculty of Chemistry		
Name and surname of lecturer (lecturers)	Subject supervisor	dr hab. inż. Ewa Wagner-Wysiecka	
	Teachers		

Lesson types and methods of instruction

Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
Number of study hours	15.0	0.0	15.0	0.0	0.0	30

E-learning hours included: 0.0

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	30	3.0	42.0	75

Subject objectives

The aim of the course is to familiarize the student with the functioning of medical laboratories and the specificity and scope of determinations carried out in them.

Learning outcomes

Course outcome	Subject outcome	Method of verification
[K6_W02] knows and understands, to an advanced extent, selected laws of physics and physical phenomena as well as methods and theories explaining the complex relationships between them, constituting the basic general knowledge in the field of technical sciences related to the field of study	- The student knows and understands the principles of the human body - Student knows and understands the specificity of analytical determinations related to clinical analyst - Student understands the role of modern clinical analytics in biomedical engineering	[SW1] Assessment of factual knowledge
[K6_U51] can conduct laboratory work connected with chemistry and biochemistry, specific to biomedical engineering	- Student is able to carry out experiments related to the use of clinical analytics in biomedical engineering	[SU1] Assessment of task fulfilment
[K6_U53] can apply equipment used in biomedical diagnostics	- The student is able to use and use analytical apparatus used in the determination in the field of biomedical engineering	[SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment

Subject contents

Lecture:Clinical analysis and its role in the contemporary medical diagnostics. The specificity of determinations in clinical analysis. Sampling, sample storage and its influence on the correct result of the analysis. Separation methods. Error sources. Spectroscopic methods in clinical analysis – UV-Vis spectroscopy, spectrofluorimetry, emission and absorption atomic spectroscopy. Chromatographic methods in clinical analysis (gas chromatography, high performance liquid chromatography). Electrophoresis in clinical analysis. Electroanalytical methods in clinical analysis. Enzymes in clinical analysis. The examples of clinical determinations. The analysis of the metabolic processes – water- electrolytes balance. The analysis of the metabolic processes – trace elements. Lipids transformations. The drug level monitoring. Automatisaton and miniaturization in clinical analysis. The application of clinical analysis methods in pharmaceutical analysis and in pharmaceutical industry. The application of clinical analysis methods in criminology. Laboratory: The selected methods of drug determination in the body fluids. Fluorimetry and UV-Vis spectroscopy: the comparison of methods on the basis of porphyrines determination. The use of routine laboratory tests in clinical analysis. Determination of enzymes activity: the determination of lactate dehydrogenase activity in a blood serum. Visit at laboratory of clinical analysis.

Prerequisites and co-requisites	The knowledge and skills from the subjects: Chemistry and Analytical chemistry.
Assessment methods and criteria	

Subject passing criteria	Passing threshold	Percentage of the final grade
tests refering to laboratory exercises	51.0%	50.0%
Written test on the ground of the lectures	51.0%	50.0%

Recommended reading	Basic literature	1. Zarys biochemii klinicznej i analityki" Praca zbiorowa pod red. S. Angielskiego I J. Rogulskiego, PZWL, W-wa, 1982 2. T. Badzio, J. Rogulski „ Analityczne podstawy diagnostyki laboratoryjnej" Gdańsk, AMG, 2000 3. „Diagnostyka laboratoryjna z elementami biochemii klinicznej" pod red. A . Dembińskiej-Kieć, J. W. Naskalskego Wydawnictwo Urban&Partner, Wrocław, 2002 4. A. Przondo-Mordarska „Podstawowe procedury laboratoryjne w bakteriologii klinicznej" PZWL, W-wa, 2005 5. J. Minczewski, Z. Marczenko „ Chemia analityczna" t.2 . PWN, W-wa, 2007 6. W. Szczepaniak „Metody instrumentalne w analizie chemicznej". PWN, W-wa, 2007
	Supplementary literature	1. F. Kokot „Badania laboratoryjne w codziennej praktyce: wartości referencyjne i interpretacje" PZWL, W-wa, 2002 2. R. Caquet „250 badań laboratoryjnych" PZWL, W-wa, 2007 3. T. Kędryna, M. Gałka-Walczak, B. Ostrowska „Wybrane zagadnienia z biochemii ogólnej z ćwiczeniami" Wydawnictwo Uniwersytetu Jagiellońskiego, Kraków, 2001 4. „Miniaturyzacja w chemii analitycznej" praca zbiorowa pod red. Z. Brzózki. Oficyna Wydawnicza Politechniki Warszawskiej , W-wa 2005
	eResources addresses	Adresy na platformie eNauczanie:
Example issues/ example questions/ tasks being completed		
Work placement	Not applicable	

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