

FACULTY of CHEMISTRY

SUBJECT CARD

Name of subject in Polish ...Leki nieorganiczne.....

Name of subject in English ...Inorganic drugs.....

Main field of study (if applicable):Biosciences.....

Specialization (if applicable): ...Medicinal Chemistry.....

Profile: academic

Level and form of studies: 2nd level, full-time

Kind of subject: obligatory

Subject code W03BSS-SM2025W

Group of courses: NO

	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15				
Number of hours of total student workload (CNPS)	25				
Form of crediting (Examination / crediting with grade)					
For group of courses mark (X) final course					
Number of ECTS points	1				
including number of ECTS points for practical classes (P)					
including number of ECTS points corresponding to classes that require direct participation of lecturers and other academics (BU)	0.65				

*delete as not necessary

PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES

1. Principles of inorganic chemistry.
- 2.
- 3.

SUBJECT OBJECTIVES

C1 To provide students with inorganic biologically active compounds and their influence on human metabolism.

C2 To provide students with issues regarding the use of inorganic compounds in the field of medicine and pharmacy.

SUBJECT EDUCATIONAL EFFECTS

relating to knowledge:

PEU_W01 – the student has general knowledge about metal-based inorganic drugs and metal-based diagnostic agents and knows the basic concepts in the field of inorganic

<p>medicinal chemistry.</p> <p>PEU_W02 – the student knows the structure of commonly used inorganic drugs and their physicochemical properties, reactivity, and mechanism of their action.</p> <p>PEU_W03 – has general knowledge about current development directions and the latest discoveries regarding the use of inorganic compounds in therapy and diagnostics,</p> <p>PEU_W04 – can distinguish particular groups of inorganic drugs and determine their use and therapeutic effect.</p>
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PROGRAMME CONTENT

Lecture		Number of hours
Lec 1	Medicinal inorganic chemistry: state of the art. Classification of metal-based drugs according to their mechanisms of action (essential elements, therapeutic agents, radiopharmaceuticals, metallomics, chelation therapy, enzyme mimics, contrast agents, protein/enzyme regulators). Design of therapeutic and diagnostic agents.	2
Lec 2	The concept of bond theory in medicinal inorganic chemistry: nomenclature, coordination geometry, chelating ligands, isomerism, kinetic and thermodynamic stability.	2
Lec 3	Metal compounds as therapeutic agents. (antibacterial and antiviral agents, antiparasitic drugs, antiarthritic drugs, antimalarial drugs, treatment of diabetes and obesity, redox-active metal-based mediators).	3
Lec 4	Metal-related metabolic disorders. (controversial drugs, heavy-metal poisoning, chelation therapy).	1
Lec 5	Medical diagnostics with the use of inorganic complexes and radioisotopes (MRI, MRA, PET, SPECT).	2
Lec 6	Discovery of cisplatin, synthesis, its mechanism of anticancer activity and the path to obtaining next generations of drugs based on platinum.	2
Lec 7	Search for non-platinum anticancer drugs with the interesting biological properties (drugs based on: Pd, Ti, Ga, As, Ru, Bi, V, Au).	2
Lec 8	Final test.	1
	Total hours	15

TEACHING TOOLS USED

N1. Lecture with multimedia presentation.
 N2.
 N3.

EVALUATION OF SUBJECT LEARNING OUTCOMES ACHIEVEMENT

Evaluation (F – forming during semester), P – concluding (at semester end)	Learning outcomes code	Way of evaluating learning outcomes achievement
P	PEU_W01-PEU_W04	Final test

PRIMARY AND SECONDARY LITERATURE		
<u>PRIMARY LITERATURE:</u>		
[1]	E. Alessio (Ed.) Bioinorganic Medicinal Chemistry, Wiley-VCH, 2011	
[2]	K. A. Strohfeldt, Essentials of Inorganic Chemistry for Students of Pharmacy, Pharmaceutical Sciences and Medicinal Chemistry, Wiley, 2015,	
[3]	J.C. Dabrowiak Metals in Medicine. Wiley, 2009.	
<u>SECONDARY LITERATURE:</u>		
[4]	Nicholas P. Farrell, Uses of inorganic chemistry in medicine, RSC, 1999.	
[5]	EudraLex, The Rules Governing Medicinal Products in the European Union, Volume 4, EU Guidelines for Good Manufacturing Practice for Medicinal Products for Human and Veterinary Use, European Commission, health and consumers directorate-general, Ref. Ares(2012)778531 - 28/06/2012.	
[6]	J.L.Sessler, S.R.Doctrow, T.J.McMurry, S.J.Lippard, Medicinal Inorganic Chemistry 2005.	
[7]	Metallopharmaceuticals I, DNA Interactions Eds. M.J. Clarke, P.J. Sadler (1999).	
[8]	Metallopharmaceuticals II, Diagnosis and Therapy. Eds. M.J. Clarke, P.J. Sadler (1999).	
SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)		
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