


KAPITAŁ LUDZKI
 NARODOWA STRATEGIA SPÓJNOŚCI

 Projekt współfinansowany przez
 Unię Europejską w ramach
 Europejskiego Funduszu
 Społecznego

UNIA EUROPEJSKA
 EUROPEJSKI
 FUNDUSZ SPOŁECZNY


Course title		ECTS code	
Drug design		13.3.1217	
Name of unit administrating study			
null			
Studies			
faculty	field of study	type	second tier studies (MA)
Faculty of Chemistry	Chemical Business	form	full-time
		specialty	all
		specialization	all
Faculty of Chemistry	Chemistry	type	second tier studies (MA)
		form	full-time
		specialty	all
Faculty of Chemistry	Environmental Protection	specialization	all
		type	second tier studies (MA)
		form	full-time
		specialty	all
		specialization	all
Teaching staff			
dr hab. Elżbieta Jankowska, profesor uczelni; dr Julia Witkowska			
Forms of classes, the realization and number of hours		ECTS credits	
Forms of classes		2 classes - 15 h tutorial classes - 15 h student's own work - 20 h TOTAL: 50 h - 2 ECTS	
Lecture			
The realization of activities			
classroom instruction			
Number of hours			
Lecture: 15 hours			
The academic cycle			
2023/2024 winter semester			
Type of course		Language of instruction	
an elective course		english	
Teaching methods		Form and method of assessment and basic criteria for evaluation or examination requirements	
Lecture with multimedia presentation of basic issues in the drug discovery process		Final evaluation	
		Graded credit	
		Assessment methods	
		Exam with closed (test) and open questions	
		The basic criteria for evaluation	
		Achievement of at least 51 % of the total number of points from the written exam	
Method of verifying required learning outcomes			
Required courses and introductory requirements			
A. Formal requirements			
lack			
B. Prerequisites			
lack			
Aims of education			
The aim of the lecture is to familiarize students with the challenges faced by scientists and pharmaceutical companies involved in drug discovery. The skills and tools that chemists can use to support the drug design process will also be indicated.			
Course contents			

the drug discovery process (identification and validation of targets, structure-based drug design, lead identification and optimization, preclinical and clinical trials, drug approval and marketing)

basic pharmacokinetic properties of drugs (Lipinski rule of five)

drug absorption, distribution, metabolism, and excretion (ADME)

drug potency, stability and toxicity

antibacterial, antiviral and anti-cancer drugs

nature as a drug source

the art of transforming peptides into drugs, bioisosterism in a drug design process

proteins and antibodies as biological drugs

prodrugs in contemporary drug design

economic aspects in drug discovery

Bibliography of literature

Literature required to pass the course

monographic materials provided by the teacher

scientific papers indicated by the teacher

Extracurricular readings

Valko K., Physicochemical and biomimetic properties in drug discovery, Wiley 2014

Textbook of drug design and discovery, Stromgaard K., Krosggaard-Larsen P., Madsen U. (Eds.), CRC Press 2016

Ng R., Drugs: from discovery to approval, Wiley-Blackwell 2015

Trabocchi A., Guarna A., Peptidomimetics in organic and medicinal chemistry, Wiley 2014

Bioisosters in medicinal chemistry, Brown N. (Ed.), Wiley-VCH 2012

The learning outcomes (for the field of study and specialization)

Chemistry:

K_W05: has extended knowledge in the field of the specialization studied

K_W11: demonstrates in-depth knowledge about the current trends in the development of chemistry as a science and the latest discoveries in this field

K_U04: applies acquired knowledge of chemistry and related scientific disciplines

K_U10: reads with understanding scientific and popular science chemical texts in English

K_K05: understands the need for independent search of information in scientific literature and popular science magazines

Chemical Business:

K_BChII_W05: knows and understands the main directions of the development of chemistry combined with economics as two interpenetrating scientific disciplines

K_BChII_U01: based on the acquired knowledge is able to propose a solution to problems in chemistry, taking into account the economic aspect, using advanced measurement and analytical techniques

K_BChII_K03: is willing to critically assess the level of his/her own knowledge in the light of the achievements of the studied scientific discipline

Environmental Protection:

K_OŚII_W01: describes in an in-depth manner complex phenomena and processes occurring in nature, including those related to the spread of anthropogenic pollution

K_OŚII_U06: defines her/his interests and develops them within the chosen specialization and themes of her/his master's thesis while implementing the process of self-education and planning own future career

K_OŚII_K10: has a need for continuous professional development

Knowledge

Students:

describe the main stages of drug design

indicate the most important problems encountered at each stage of drug discovery

describe target and lead identification processes

list and characterize the properties modified in the lead optimization process

describe the advantages and disadvantages of low-molecular, peptide and protein drugs, including their impact on environment pollution

characterize the differences in antibacterial, antiviral and anti-cancer drug design

list the components of costs generated in the drug search process

describe the achievements and challenges of contemporary drug design

Skills

Students:

describes with understanding methods for determining and modifying the properties of potential drugs

propose alternative solutions to economic problems encountered at each stage of drug discovery

Social competence

Students understand the importance of self-learning and rising their competences

Contact

elzbieta.jankowska@ug.edu.pl