

FACULTY OF CHEMISTRY					
SUBJECT CARD					
Name of subject in Polish:	Syntetyczne leki organiczne				
Name of subject in English:	Synthetic organic drugs				
Main field of study:	Chemistry				
Specialization:	Medicinal Chemistry				
Profile:	academic and practical				
Level and form of studies:	2 <sup>nd</sup> level, full-time				
Kind of subject:	obligatory				
Subject code:	CHC024064				
Group of courses:	NO				
	Lecture	Classes	Laboratory	Project	Seminar
Number of hours of organized classes in University (ZZU)	15		60		15
Number of hours of total student workload (CNPS)	60		120		30
Form of crediting	crediting with grade		crediting with grade		crediting with grade
For group of courses mark (X) final course					
Number of ECTS points	2		4		1
including number of ECTS points for practical (P) classes			4		1
including number of ECTS points for direct teacher-student contact (BK) classes	0,5		4		0.5
<b>PREREQUISITES RELATING TO KNOWLEDGE, SKILLS AND OTHER COMPETENCES</b>					
1. Principles of organic chemistry, theoretical and practical. 2. Basic knowledge on biochemistry. 3. Knowledge in the field of basis of analytical chemistry is recommended.					
<b>SUBJECT OBJECTIVES</b>					
C1 Introduction to the type of drug targets. C2 Basic important places and molecules as potential drug targets C3 The strategy of action of particular classes of drugs. C4 Acquainting student with the theoretical and practical aspects of good laboratory practice (GLP) rules in the context of qualitative and quantitative analysis of biologically active ingredients (APIs) in pharmaceutical formulations. C5 Acquainting students with various concepts of isolation of API from different drug formulations and methods of its qualitative and quantitative analysis. C6 Expanding knowledge of spectroscopic methods use in API qualitative analysis.					
<b>SUBJECT EDUCATIONAL EFFECTS</b>					
<b>Relating to knowledge:</b>					
Student, who has completed the course:					
PEK_W01 – has knowledge on the main drug targets,					
PEK_W02 – has knowledge on the strategy of action of basic classes of drugs,					

PEK\_W03 – can define the possible mechanisms of action of main drug classes.

**Relating to skills:**

Student, who has completed the course:

PEK\_U01 - has the ability to identify APIs in a pharmaceutical formulation in characteristic reactions,

PEK\_U02 - has the ability to perform analyzes of biologically active compounds using simple analytical methods, interpreting results and preparing a report in accordance to GLP,

PEK\_U03 - has the ability to use separation techniques to extract APIs from the pharmaceutical formulations, their determination, interpretation of results and preparation of a report in accordance with GLP.

**Relating to social competences:**

PEK\_K01 has the competence to cooperate in a team.

**PROGRAMME CONTENT**

Lectures		Number of hours
Lec 1	Short history of synthetic drugs.	2
Lec 2	Drug targets, carbohydrates, lipids.	2
Lec 3	Drug targets enzymes, DNA, RNA.	2
Lec 4	Strategy of fight with virus.	2
Lec 5	Strategy of fight with bacteria.	2
Lec 6	Strategy of fight with cancer.	2
Lec 7	Strategy of fight with neurological disorder.	2
Lec 8	Strategy of fight with parasites.	1
Total hours		15

Laboratory		Number of hours
Lab1	Safety rules in the laboratory of organic chemistry, good laboratory practice and the rules of the reports preparation. Introduction to the separation and identification techniques in the organic chemistry laboratory.	4
Lab2	Quantitative and qualitative analyzes of one biologically active ingredient drug in the form of a tablet.	4
Lab3	Pharmacopoeia analysis of one biologically active ingredient drug in the form of a tablet.	4
Lab4	Isolation, quantitative and qualitative analyzes of API from a tablet form.	4
Lab5	Two compounds drug – separation of APIs from a tablet.	4
Lab6	Two compounds drug – analysis of the isolated APIs.	4
Lab7	Three compounds drug in a tablet form – separation techniques in the isolation APIs.	4
Lab8	Three compounds drug in a tablet form – qualitative and quantitative methods in the analysis APIs.	4
Lab9	Analysis of a drug in a liquid formulation.	4
Lab10	Isolation of the biologically active components from the ointment form of a drug.	4
Lab11	Analysis methods of the components of the ointment formulation.	4
Lab12	Suspension form of a drug for children – isolation and purification techniques of API. Analysis of the main compound.	4
Lab13	Williamson ether synthesis of API. Purification of the final product.	4
Lab14	The comparison of API isolated from a tablet form of a drug with this synthesized.	4
Lab15	Analyzes of the results of experiments. Final conclusion.	4
Total hours		60

Seminar		Number of hours
Se1	Selected examples of great discovery in drug development	2
Se2	Selected examples of drugs acting on carbohydrates and lipids	2
Se3	Selected examples of drugs acting on enzymes, DNA, RNA	2
Se4	Selected examples of antiviral drugs	2
Se5	Selected examples of antibacterial drugs	2
Se6	Selected examples of anticancer drugs	2
Se7	Selected examples of drugs acting on CNS	2
Se8	Selected examples of drugs acting on parasites	1
Total hours		15

#### TEACHING TOOLS

N1 Multimedial presentation.

N2 Performing experiments with different laboratory equipment and instruments.

N3 Preparation of report including analysis and interpretation of obtained results.

#### EVALUATION OF SUBJECT EDUCATIONAL EFFECTS ACHIEVEMENT

Evaluation (F – forming (during semester), P – concluding (at semester end))	Educational effect number	Way of evaluating educational effect achievement
F1	PEK_W01-W03	exam
F2	PEK_U01 – PEK_U03 PEK_K01	grades of the reports of the experiments
P1 (lecture)	PEK_W01-W03	exam
P2 (laboratory)	PEK_U01 – PEK_U03	average grade of the reports grades (F2)

	PEK_K01	
P3 (seminar)	PEK_W02	Presentation evaluation and grading
PRIMARY AND SECONDARY LITERATURE		
<b>PRIMARY LITERATURE:</b> [1] Partick, Graham, An introduction to medicinal chemistry [2] Farrell Susan, Principles of Pharmacology [3] Moynihan, Humphrey A. The physicochemical basic of pharmaceuticals. [4] R. Gancarz, Synthetic organic drug. Script for Medicinal Chemistry – Politechnika Wrocławska, 2011. [5] I. Pawlaczyk, R. Gancarz, Synthetic organic drugs. Labotaroty. Drugs analysis. Script for Medicinal Chemistry – Politechnika Wrocławska, 2011. [6] A.C. Moffat, M.D. Osselton, B. Widdop, Clarke's analysis of drugs and poisons. Pharmaceutical Press, 2005.		
<b>SECONDARY LITERATURE:</b> [1] Donald J. Abraham, Burgers Medicinal Chemistry and Drug Discovery vol 1-6 [2] R Kasprzykowska, AS Kołodziejczyk, Chemiczna analiza środków leczniczych (leki proste). Skrypt z chemii leków. Uniwersytet Gdański, Gdańsk, 2010.		
SUBJECT SUPERVISOR (NAME AND SURNAME, E-MAIL ADDRESS)		
prof. dr hab. inż. Roman Gancarz, roman.gancarz@pwr.edu.pl dr inż. Izabela Pawlaczyk-Graja, izabela.pawlaczyk@pwr.edu.pl		