CLINICAL PHARMACY

1. Information about the program

1.1.	UNIVERSITY: "GRIGORE T. POPA" UNIVERSITY OF MEDICINE AND PHARMACY OF IAŞI
1.2.	FACULTY: PHARMACY SCHOOL / DEPARTMENT: PHARMACEUTICAL SCIENCES II
1.3.	SUBJECT: PHARMACODYNAMICS AND CLINICAL PHARMACY
1.4.	STUDY FIELD: HEALTH
1.5.	STUDY CYCLE: UNDERGRADUATE
1.6.	STUDY PROGRAMME: PHARMACY

2. Subject data

2.1.	SUBJECT: CLINICAL PHARMACY						
2.2.	Module leader: Prof. Veronica Bild, PhD						
2.3.	Seminar leader: -						
2.4. Year of study	IV	2.5. Semester in which is taught	II	2.6. Evaluation type	E2	2.7. Subject status	Compulsory

3. Duration of the course (hours per semester)

3.1. Number of hours / week	1	3.2. Number of hours / week	1	3.3.Seminar / lab	0
3.4.Total number of learning hours	14	3.5.Total number of learning hours	14	3.6. seminar / lab	0
3.7.Distribution of activities in the course					hours
Study based on the manual, printed course, bibliography and notes					29
Additional research in the library, on specialized e-platforms and field study					5
Preparation for seminars, practical courses, portfolios and essays					0
Tutoring					2
Assessment					-
Other activities					-
3.8. Number of hours of individual study					36
3.9. Number of hours per semester					50
3.10. Number of ECTS					2

4. Previous Knowledge (if applicable)

4.1. course related	Biopharmacy, General pharmacokinetics.
4.2. skill related	Basic parameters of clinical pharmacokinetics: plasmatic concentration, apparent volume of distribution, clearance, elimination constant, biological half-life; bioequivalence, types of kinetic.

5. Requirements (if applicable)

5.1. course conditions	Audio-video equipment.
5.2. seminar / laboratory conditions	It is not the case.

6. Specific Skills Acquired

Professional skills displayed by knowledge and skills	• Clinical evaluation of the patient with respiratory disease: symptoms and signs, history, type of medication, major contraindications and side effects. • Evaluation of the dyspneea and parameters of the spirometry, reading of the chest radiography. • Clinical evaluation of the patient with cardiovascular disease: symptoms and signs, history, type of medication, major contraindications and side effects. • Measurement of blood pressure and heart rate. • Recording and reading of the electrocardiogram in emergency (acute ischemia, myocardial infarction, rhytm troubles). • Clinical evaluation of the patient with digestive and metabolic disease: symptoms and signs, history, type of medication, major contraindications and side effects. • Clinical evaluation of the patient with renal disease: symptoms and signs, history, type of medication, major contraindications and side effects. • Interpretation of the routine biological parameters.
Transversal skills (role skills, professional and personal skills)	• Autonomy and responsibility - the execution of some complex educational tasks under conditions of autonomy. • Social interaction and teamwork - assuming the roles / functions of leadership of working or research teams, learning group work. • Initiative and entrepreneurship. • Written and oral expression skills. • Language skills. • Respect and development of professional values and ethics. • Problem solving and decision making. • Recognize and respect for diversity and multiculturalism.

7. Course Objectives (confirmed by the grid of specific skills acquired)

7.1. General Objective	Learning the basic notions regarding the concept of clinical pharmacy; clinical pharmacist duties.
7.2. Specific Objectives	Learning the basic notions regarding clinical pharmacokinetics: clinical pharmacokinetics basic parameters and their applications.

8. Contents

8.1. Course	Teaching methods	Observations
1. Clinical pharmacy: definition, introduction 1.1. Factors which have imposed the appearance of clinical pharmacy as a specialization 1.2. Defining the concept of clinical pharmacy	Lecture, open discussion, correlation with notions acquired at curriculum preconditions	2 hours
2. Attributions of the clinical pharmacist: clinical activities, training activity, research activity	Lecture, open discussion, correlation with notions acquired at curriculum preconditions	2 hours
3. Clinical pharmacy in "clinically-oriented" community pharmacy (for ensuring a qualitative ambulatory therapeutic activity) 3.1. General clinical pharmacokinetics: the notion of compartment 3.2. The basic postulate of pharmacokinetics	Lecture, open discussion, correlation with notions acquired at curriculum preconditions	2 hours
3. Basic parameters of clinical pharmacokinetics and their applications 3.1. Plasma concentration, 3.2. Apparent volume of distribution (Vd), 3.3. Clearance (Cl) 3.4. Rate of elimination (Ke) 3.5. Biological half-life ($T_{1/2}$)	Lecture, open discussion, correlation with notions acquired at curriculum preconditions	2 hours
4. Bioavailability and therapeutic effect; bioequivalence, substitution of drugs that contain the same active substance	Lecture, open discussion, correlation with notions acquired at curriculum preconditions	2 hours
5. Types of kinetics and compartmentalized models	Lecture, open discussion, correlation with notions acquired at curriculum preconditions	2 hours
6. Kinetics for single and multiple dose; treatment regimen	Lecture, open discussion, correlation with notions acquired at curriculum preconditions	2 hours

Bibliography

1. **Atkinson AJ, Huang S-M, Lertora JJL, Markey SP.** *Principles of Clinical Pharmacology*. Third Edition. London: Academic Press, 2012.
2. Bennett PN, Brown MJ, Sharma P. *Clinical Pharmacology*. Eleventh Edition. London: Churchill Livingstone, 2012.
3. Cristea AN. *Farmacologie generală*. Bucureşti: Editura Didactică şi Pedagogică, 1998-2010.
4. Cristea AN. *Farmacie clinică*. Vol. II. Bucureşti: Editura Medicală, 2012.
5. Cristea AN. *Farmacie clinică. Vol. I. Farmacia Clinică în farmacia de comunitate*. Bucureşti:

Editura Medicală, 2006.
6. Mattison D. *Clinical Pharmacology During Pregnancy, First Edition*. London: Academic Press, 2013.
7. Rang HP, Dale MM, Ritter JM, Flower RJ. *Rang and Dale's Pharmacology, Sixth Edition*. London: Churchill Livingstone Elsevier, 2008.

8.2. Seminar / Practical lessons	**Teaching Methods**	**Observations**
Not applicable	-	-

Bibliografie / Bibliography

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9. The agreement between the course contents and the expectations of the representatives of the epistemic communities, professional associations and employers in the field related to the program

The study program of the discipline is developed and revised periodically to meet the market dynamics of academic and professional qualifications, so as to ensure the formation of graduates who are capable of integrating into the labor market in health systems. Also, the study program contributes to the development of professional skills needed in the labor market.

10. Assessment

Activity	**10.1. Assessment criteria**	**10.2. Assessment methods**	**10.3. Percentage of the final grade**
10.4. Course	Answers to exam/ colloquium (final examination).	Descriptive written paper	50%
	Analysis of a practical application.	Descriptive written paper	35%
	Realizing an argumentative application.	Descriptive written paper	15%
10.5. Seminar / Practical lessons	-	-	-
Minimal standard of proficiency: Promotion with minimum grade 5.			
• Basic parameters of clinical pharmacokinetics and thereof clinical applications. • Kinetics in single doses and repeated doses conditions.			