

Faculty of Medicine, University of Rijeka

Course: Pharmacology

Course coordinator: Kristina Pilipović, MD, PhD, Associate Professor

Department: Department of Basic and Clinical Pharmacology and Toxicology

Study program: Integrated Undergraduate and Graduate University Study of Medicine in English

Year: 3rd

Academic year: 2021/2022

SYLLABUS

Course description (a brief description of the course, general instructions, where and what form the lessons are organized, necessary equipment, instructions for attendance and preparation for classes, student obligations, etc.)

The course **Pharmacology** is a compulsory course in the third year of the Integrated Undergraduate and Graduate University Study of Medicine in English. It consists of 30 hours of lectures, 85 hours of seminars, and 15 hours of practicals - overall 130 hours (10 ECTS).

Course objective

The main aim of the Pharmacology course is to provide the acquisition of necessary knowledge in the area of basic and special pharmacology, as well as in the area of pharmacotoxicology and rational pharmacotherapy. In detail, the objective of the course is knowledge acquisition in the fields of mechanisms of drug actions, therapeutic and adverse effects, routes of administration, indications, and contraindications of the most important groups of drugs, and understanding of pharmacological characteristics of "prototype" drugs for each pharmacotherapeutic class. Additionally, each student must obtain the skill in prescribing different drug formulations and the ability to use relevant sources of pharmacology literature as a critical approach concerning the quality of each drug.

Course content:

Basic pharmacology: basic pharmacological terms, pharmacology disciplines, drug nomenclature, mechanisms of drug action, pharmacokinetics, factors affecting drug effects

Special pharmacology: pharmacodynamics, pharmacokinetics, indications, contraindications and adverse effects of the most important pharmacological drug groups and particular drugs

Toxicology: drug toxicology

General principles of clinical pharmacology: drug discovery and development, preclinical and clinical trials

Pharmacography: legal regulations and rules of prescribing different drug formulations

Course learning outcomes

I. Cognitive domain – knowledge

After having passed the Pharmacology course, students should be able to:

1. describe and explain the general principles of pharmacodynamics and pharmacokinetics,
2. list and describe different factors that modify drug effects,
3. define and explain the types and mechanisms of drug interactions,
4. classify drugs in different groups/subgroups,
5. define, describe and explain the routes of administration, the mechanisms of action at the molecular and cellular level, pharmacological effects on different organ systems, the main therapeutic indications and contraindications, the most important adverse effects and toxicity of particular drugs that are illustrative examples of pharmacotherapeutic groups and subgroups they belong to,
6. analyze pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs which belong to different subgroups within the same drug groups and then compare them,
7. describe the symptoms and therapy of clinically the most important drug poisonings,
8. list clinically important drug interactions, and
9. describe and explain the process of new drug discovery and development.

II. Psychomotor domain - skills

After having passed the Pharmacology course, students should acquire the skills of prescribing different drug formulations.

Assigned reading:

1. Katzung BG, Edit., Basic & Clinical Pharmacology, 14th Edition, McGraw-Hill Education, New York, USA, 2018.
2. Bradamante V, Klarica M, Šalković-Petrišić M, Edits. Pharmacology Manual, 1st Edition in English, Medicinska naklada, Zagreb, 2010.

Optional/additional reading:

1. Ritter J., Flower R, Henderson G, Rang H. Rang & Dale's Pharmacology, 8th Edition, Elsevier, Churchill Livingstone, London, UK, 2015.

COURSE TEACHING PLAN

The list of lectures with topics and learning outcomes:

Lecture 1

Introductory Lecture; Pharmacology – Disciplines; Nature, development and regulation of drugs

Learning outcomes:

To acquaint students with the content and aims of the course and the Syllabus. To inform students about their rights and obligations. To be able to define and explain certain disciplines of Pharmacology. To be able to define and explain the development process and individual stages of research of new drugs

Lecture 2

Drug Nomenclature; Transfer of Drugs Across Cell Membranes; Drug Administration, Absorption and Distribution

Learning outcomes:

To be able to explain the features of drug names. To be able to define and explain different routes of drug application. To understand and explain how the drugs pass through cell membranes. To acquire knowledge about the distribution of drugs in the blood and tissues.

Lecture 3

Biotransformation and Elimination of Drugs; Pharmacogenomics

Learning outcomes:

To know and explain the reactions involved in the process of biotransformation of drugs. To know and understand the basic principles of pharmacogenomics. To know and explain drug elimination pathways

Lecture 4

Drugs and Organism Characteristics Affecting Drug Activity; Allergic and Idiosyncratic Reactions

Learning outcomes:

To describe and explain the influence of chemical structure, doses, route, and time of drug administration on its activity. To list and explain the mechanisms of drug-drug interactions. To explain the influence of age, body mass, and sex on drug activity. To differ, understand, and explain the characteristics of allergic and idiosyncratic reactions.

Lecture 5

Adrenoreceptor Agonists and Sympathomimetic Drugs

Learning outcomes:

To describe and explain the routes of administration of adrenergic receptor agonists and other sympathomimetics, mechanism of their action, pharmacological effects, main indications, contraindications, side effects and toxicity of certain drugs which are an illustrative example of this pharmacotherapeutic group. To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Lecture 6

Adrenoreceptor Antagonist Drugs

Learning outcomes:

To describe and explain the routes of administration of adrenergic receptor antagonists and other sympatholytics, mechanism of their action, pharmacological effects, main indications, contraindications, side effects and toxicity of certain drugs which are an illustrative example of this pharmacotherapeutic group.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Lecture 7

Nonsteroidal Anti-Inflammatory Drugs, Disease-Modifying Antirheumatic Drugs, Nonopioid Analgesics, & Drugs Used in Gout

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Lecture 8

Antipsychotic Agents, Drugs Used to Treat Alzheimer's Disease

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Lecture 8

Opioid Agonists and Antagonists

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Lecture 9

Sedative-Hypnotic Drugs; Antiseizure Drugs

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Lecture 10

Drugs of Abuse

Learning outcomes:

To acquire basic knowledge concerning different drugs of abuse and the principles of their toxicity, as well as the symptoms and the treatment of poisonings by them.

The list of seminars with topics and learning outcomes:

Seminar 1

Drug receptors & Pharmacodynamics; Pharmacokinetics & Pharmacodynamics: Rational Dosing & the Time Course of Drug Action

Learning outcomes:

To list and explain the structure of different receptor classes.

To explain the effects of stimulation of different receptors.

To acquire the knowledge concerning basic pharmacodynamic terms and principles.

To list, define, and explain basic pharmacokinetic terms and principles.

Seminar 2

Cholinoceptor-Activating & Cholinesterase-Inhibiting Drugs; Cholinoceptor-Blocking Drugs; Skeletal Muscle Relaxants

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 3

Adrenoceptor Agonists & Sympathomimetic Drugs, Adrenoceptor Antagonist Drugs

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 4

Antipsychotic Agents & Lithium; Antidepressant Agents; Drugs Used in Alzheimer's disease

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to. To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 5

General Anesthetics; Local Anesthetics; Pharmacologic Management of Parkinsonism & Other Movement Disorders

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 6

Drugs Used in Asthma; Histamine, Serotonin & the Ergot Alkaloids: H₁-Receptor Antagonists

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 7

Drugs Used in Disorders of Coagulation; Agents Used in Cytopenias; Hematopoietic Growth Factors

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 8

Drugs Used in Heart Failure; Agents Used in Cardiac Arrhythmias

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 9

Vasodilators & the Treatment of Angina Pectoris; Agents Used in Dyslipidemia

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 10

Hypothalamic & Pituitary Hormones; Thyroid & Antithyroid Drugs; Adrenocorticosteroids & Adrenocortical Antagonists

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 11

The Gonadal Hormones/Inhibitors; Agents that Affect Bone Mineral Homeostasis

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 12

Pancreatic Hormones & Antidiabetic Drugs; Drugs Used in the Treatment of Gastrointestinal Diseases

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 13

Beta-Lactam and Other Cell Wall- & Membrane-Active Antibiotics; Tetracyclines, Macrolides, Clindamycin, Chloramphenicol, Streptogramins, & Oxazolidinones; Aminoglycosides & Spectinomycin; Sulfonamides, Trimethoprim & Quinolones

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 14

Antimycobacterial Drugs; Antifungal Agents; Antiviral Agents; Antiprotozoal Drugs; Clinical Pharmacology of the Anthelmintic Drugs

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 15

Miscellaneous Antimicrobial Agents; Disinfectants, Antiseptics, & Sterilants; Cancer Chemotherapy; Immunopharmacology

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Seminar 16

Over-the-Counter drugs; Dietary Supplements; Herbal Remedies; Homeopathic Remedies

Learning outcomes:

To describe and explain the regulatory aspects related to the use of these preparations; to explain the concept and significance of over-the-counter drugs; to explain the clinical aspects of herbal products and dietary supplements; to understand the basic principles of application of homeopathic remedies.

Seminar 17

Vaccines; Immune Globulins and Other Complex Biologic Products

Learning outcomes:

To describe and explain the importance of the use of drugs of the above groups, the mechanism of their action, pharmacological effects, main indications, contraindications, side effects and potential toxicity.

The list of seminars/practicals with topics and learning outcomes:

Seminar-Practical 1

Diuretic Agents; Antihypertensive Agents

Learning outcomes:

To describe and explain the routes of administration, the mechanisms of action, pharmacological effects, the main indications and contraindications, adverse effects, and toxicity of particular drugs that are illustrative examples of the mentioned pharmacotherapeutic groups they belong to.

To analyze the pharmacological effects, pharmacokinetic profile, adverse effects, indications, and contraindications between the drugs that belong to different subclasses within the same drug groups and then compare them.

Practical 1

Pharmacography: Drug Formulations (Pharmaceutical Formulations); Pharmaceutical Formulations as Systems for Drug Administration; General Drug Prescription Guidelines; Prescribing "Apothecary" and Galenic Preparations

Learning outcomes:

To list and describe different drug formulations.

To define and describe general drug prescription guidelines and legal regulations.

To acquire the skill of prescribing "apothecary" and galenic preparations.

Practical 2

Pharmacography: Prescribing Finished Drug Products

Learning outcomes:

To acquire the skill of prescribing different finished drug products.

Students' obligations:

Students are obligated to regularly attend and actively participate in classes. Students are allowed to be absent at a maximum of 30 hours of seminars + practicals. It is compulsory to follow and act in accordance with notifications and rules regarding attendance, absence, midterm exams I and II, corrections of midterm exams, final exam, etc., which will be presented at the first lecture. Additional information and rules will be announced on a regular basis and on time on the SharePoint portal of the Department and on the Merlin platform.

Assessment (exams, description of written/oral/practical exam, the scoring criteria):

During the classes of Pharmacology, a student can achieve a maximum of 70% (70 points) of their final grade, while the remaining 30% (30 points) of the grade is obtained at the final exam. Points distribution is as follows:

Midterm exam I	35 points
Midterm exam II	35 points
Total (classes)	70 points
Pre-exam colloquium in pharmacography and final exam	30 points
Total (course)	100 points

A. Midterm exams

Midterm exam I includes the topics covered at L1-L10 and S1-S7. It consists of a written test (Test I).

Test I will be held on **January 10, 2022**. The exact time and the venues will be announced later on the SharePoint portal of the Department and via Merlin platform.

Midterm exam II includes the topics covered at S8-S17 and SP1. It consists of a written test (Test II) **Test II** will be held on **May 17, 2022**. The exact time and the venues will be announced later on the SharePoint portal of the Department and via Merlin platform.

Tests I and II are evaluated according to the scheme:

Number of correct answers	Number of points
49, 50	35
47, 48	34
45, 46	33
43, 44	32
41, 42	31
39, 40	30
37, 38	29
35, 36	28
33, 34	27
31, 32	26
3,	25
29	24
28	23
27	22
26	21
25	20
24	19
23	18
22	17
21	16
20	15

Corrections of the midterm exams

Students can access the corrections of the midterm exams if they did not pass them or are not satisfied with the obtained points. If a student retakes the midterm exam because they are not satisfied with the obtained

grade points, only the grade points obtained at the retaken midterm exam(s) will be considered as valid. Students will have the opportunity to correct midterm exams I and/or II only once.

Correction of the Tests I and II will be organized between June 20, 2022 and June 24, 2022. Exact times and venues will be announced on the SharePoint portal of the Department of Pharmacology. The oral part of the midterm exams' corrections will be organized in agreement with the students.

Students are obligated to apply for the correction/s of the midterm exam I and/or II. The applications will be received until June 10, 2022 at 12 noon. If students apply for the correction/s of the midterm exam I and/or II and subsequently decide that they will not be able to access it, they must personally cancel it at the latest until one work day before the term of the midterm exam/s I and/or II until 12 noon. If a student does not personally cancel the application for the correction/s of the midterm exams, their final score will be 0 points.

Exceptionally, corrections of the midterm exams will also be organized for the students who are absent from the midterm exams due to a justified reason. In that case, they have to submit a written explanation and appropriate documentation. The materials have to be addressed to Assoc Prof Kristina Pilipović, recorded in the Registry Office of the Faculty and submitted to the Office of the Department of Pharmacology, until June 6, 2022 at 3 p.m.

B. Pre-exam Colloquium in Pharmacography

The **pre-exam colloquium in Pharmacography** includes material covered during P1-2 and consists of a written and an oral part. On the written test of knowledge in Pharmacography, the task will be to correctly prescribe four prescriptions. The oral part of the colloquium can be accessed only by a student who correctly prescribes at least two prescriptions. For each correctly prescribed recipe, the student will receive 0.25 points (maximum 1 point). Each part of the colloquium (both written and oral) must be positively graded in order for the colloquium to be considered passed.

Students who are not satisfied with the result achieved at the pre-exam colloquium in Pharmacography, can apply for the correction, only once, in one of the scheduled terms. In that case, the number of points earned on the correction will be counted as the final result!

Pre-exam colloquia in Pharmacography will be held on: June 15, 2022, June 29, 2022, July 13, 2022, September 1, 2022 and September 15, 2022. The time and places of these colloquia will be subsequently announced on the website and bulletin boards of the Department.

C. Final exam

Only students who have achieved at least 35 points during the course can take the final exam in Pharmacology. Students with less than 35 credits earned during the course must enroll in the course Pharmacology again in the next academic year.

The final exam consists of two parts: a final test and an oral exam. Each part of the final exam must be positively graded in order for the exam to be considered passed!

Final test is evaluated according to the scheme:

Number of correct answers	Number of points
66-70	9
61-65	8
55-60	7
49-54	6
42-48	5
35-41	4

0-34

0

Candidates who do not answer correctly to at least 50% of the test questions cannot access the oral part of the final exam.

Oral part of the final exam

The maximum number of points that can be obtained at the oral exam is 20 (range 10-20). For the grade 2 (sufficient), the student obtains 10 points; for the grade 3 (good), the student obtains 13 points; for the grade 4 (very good), the student obtains 16; for the grade 5 (excellent), the student obtains 20 points.

The final grade

The final grade is formed on the basis of the results obtained during the course and the grade obtained at the final exam, according to the following scheme:

Percent/credits for the acquired knowledge, skills and competences (course + final exam)	Numerical grading system	ECTS system
90 - 100%	5 (excellent)	A
75 - 89,9%	4 (very good)	B
60 – 74,9%	3 (good)	C
50 - 59,9%	2 (sufficient)	D
0 - 49,9%	1 (unsufficient)	F

Other important information regarding the course:

This Syllabus was prepared in July 2021 when it was not possible to predict the epidemiological situation regarding the development of the novel coronavirus pandemic in the academic year 2021/2022. Therefore, there is a possibility of changes in the implementation of this Syllabus that will adapt to the current epidemiological situation, and which will be published on time on the SharePoint portal of the Department.

The first lecture will be held online on Wednesday, October 6, 2021, by using the Microsoft Teams application in the Office 365 system. Students should sign in to Microsoft Teams with their AAI user account and password. For the lectures, in the Microsoft Teams application, students will be added to a team named “Pharmacology 2021/2022”. They are required to join the meeting/lecture using their computers/smartphones/tablets at 8.15 AM. Students are obligated to make sure that the cameras, speakerphones, and microphones on their devices are working properly.

Academic honesty

It is expected that all students and teachers follow the code of academic honesty in accordance with the Code of Ethics for the students of the Faculty of Medicine at the University of Rijeka. Please read the policy regarding academic honesty at: <http://medical-studies-in-english.com/wp-content/uploads/2016/12/CODE-OF-ETHICS.pdf>

Contact information

For all questions and concerns, students are encouraged to contact us by e-mail or personally.

COURSE SCHEDULE for the academic year 2021/2022

Date	Lectures (time and venue)	Seminars (time and venue)	Practicals (time and venue)	Lecturer
6.10.2021.	L1 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Assoc Prof Kristina Pilipović, MD, PhD
13.10.2021.	L2 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Prof Dinko Vitezić, MD, PhD
20.10.2021.	L3 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Assoc Prof Kristina Pilipović, MD, PhD
27.10.2021.	L4 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Assoc Prof Kristina Pilipović, MD, PhD
2.11.2021		S1A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Assoc Prof Kristina Pilipović, MD, PhD
3.11.2021.	L5 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Assoc Prof Kristina Pilipović, MD, PhD
4.11.2021.		S1B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Jelena Rajič Bumber, MA in Biol.
8.11.2021.		S2A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Tamara Janković, MA in S.E.
9.11.2021.		S2B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Tamara Janković, MA in S.E.
10.11.2021.	L6 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Assoc Prof Kristina Pilipović, MD, PhD
15.11.2021.		S3A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Jelena Rajič Bumber, MA in Biol.
16.11.2021.		S3B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Jelena Rajič Bumber, MA in Biol.
17.11.2021.	L7 (12 ¹⁵ -15 ⁰⁰) Online lecture (Microsoft Teams)			Assoc Prof Kristina Pilipović, MD, PhD
22.11.2021.		S4A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Prof Dinko Vitezić, MD, PhD
23.11.2021.		S4B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Prof Dinko Vitezić, MD, PhD
24.11.2021.	L8 (8 ¹⁵ -11 ⁰⁰)			Assoc Prof Kristina Pilipović, MD, PhD

	Online lecture (Microsoft Teams)			
29.11.2021.		S5A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Tamara Janković, MA in S.E.
30.11.2021.		S5B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Tamara Janković, MA in S.E.
1.12.2021.	L9 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Prof Jasenka Mršić Pelčić, MD, PhD
6.12.2021.		S6A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Jelena Rajič Bumber, MA in Biol.
7.12.2021.		S6B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Jelena Rajič Bumber, MA in Biol.
8.12.2021.	L10 (8 ¹⁵ -11 ⁰⁰) Online lecture (Microsoft Teams)			Prof Jasenka Mršić Pelčić, MD, PhD
13.12.2021.		S7A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Ljerka Delač, MD
14.12.2021.		S7B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Ljerka Delač, MD
10.1.2022.	Midterm exam I			
17.1.2022.		S8A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Prof Dinko Vitezić, MD, PhD
18.1.2022.		S8B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Prof Dinko Vitezić, MD, PhD
24.1.2022.		S9A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Ljerka Delač, MD
25.1.2022.		S9B (12 ¹⁵ -16 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Ljerka Delač, MD
1.3.2022.			SP1A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology	Assoc Prof Kristina Pilipović, MD, PhD Prof Dinko Vitezić, MD, PhD
1.3.2022.			SP1B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology	Assoc Prof Kristina Pilipović, MD, PhD Prof Dinko Vitezić, MD, PhD
8.3.2022.		S10A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Petra Dolenc, MA in Biol., PhD

8.3.2022.		S10B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Petra Dolenc, MA in Biol., PhD
15.3.2022.		S11A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Petra Dolenc, MA in Biol., PhD
15.3.2022.		S11B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Petra Dolenc, MA in Biol., PhD
22.3.2022.		S12A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Ljerka Delač, MD
22.3.2022.		S12B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Ljerka Delač, MD
29.3.2022.		S13A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Assoc Prof Kristina Pilipović, MD, PhD
29.3. 2022.		S13B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Assoc Prof Kristina Pilipović, MD, PhD
5.4.2022.		S14A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Tamara Janković, MA in S.E.
5.4. 2022.		S14B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Tamara Janković, MA in S.E.
12.4.2022.		S15A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Asst Prof Marko Skelin, PhD
12.4.2022.		S15B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Asst Prof Marko Skelin, PhD
19.4.2022.		S16A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Prof Renata Jurišić Grubešić, MPharm, PhD
19.4.2022.		S16B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		Prof Renata Jurišić Grubešić, MPharm, PhD
26.4.2022.		S17A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		MPharm Lea Juretić
26.4.2022.		S17B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology		MPharm Lea Juretić

3.5.2022.			P1A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology	Prof Jasenka Mršić Pelčić, MD, PhD Assoc Prof Kristina Pilipović, MD, PhD
3.5.2022.			P1B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology	Prof Jasenka Mršić Pelčić, MD, PhD Assoc Prof Kristina Pilipović, MD, PhD
10.5.2022.			P2A (8 ¹⁵ -12 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology	Prof Dinko Vitezić, MD, PhD Assoc Prof Kristina Pilipović, MD, PhD
10.5.2022.			P2B (13 ¹⁵ -17 ⁰⁰) Department of Basic and Clinical Pharmacology and Toxicology	Prof Dinko Vitezić, MD, PhD Assoc Prof Kristina Pilipović, MD, PhD
17.5.2022.	Midterm exam II			

List of lectures, seminars and practicals

	LECTURES (topics)	Teaching hours	Venue
L1	Introductory Lecture; Pharmacology – Disciplines; Nature, development and regulation of drugs	3	Online lecture (Microsoft Teams)
L2	Drug Nomenclature; Transfer of Drugs Across Cell Membranes; Drug Administration, Absorption and Distribution	3	Online lecture (Microsoft Teams)
L3	Biotransformation and Elimination of Drugs; Pharmacogenomics	3	Online lecture (Microsoft Teams)
L4	Drugs and Organism Characteristics Affecting Drug Activity; Allergic and Idiosyncratic Reactions	3	Online lecture (Microsoft Teams)
L5	Adrenoreceptor Agonists and Sympathomimetic Drugs	3	Online lecture (Microsoft Teams)
L6	Adrenoreceptor Antagonist Drugs	3	Online lecture (Microsoft Teams)
L7	Nonsteroidal Anti-Inflammatory Drugs, Disease-Modifying Antirheumatic Drugs, Nonopioid Analgesics, & Drugs Used in Gout	3	Online lecture (Microsoft Teams)
L8	Opioid Agonists and Antagonists	3	Online lecture (Microsoft Teams)
L9	Sedative-Hypnotic Drugs; Antiepileptic Drugs	3	Online lecture (Microsoft Teams)
L10	Drugs of Abuse	3	Online lecture (Microsoft Teams)
	Total	30	

	SEMINARS (topics)	Teaching hours	Venues
S1	Drug receptors & Pharmacodynamics; Pharmacokinetics & Pharmacodynamics: Rationale Dosing & the Time Course of Drug Action	5	Department of Basic and Clinical Pharmacology and Toxicology
S2	Cholinoceptor-Activating & Cholinesterase-Inhibiting Drugs; Cholinoceptor-Blocking Drugs; Skeletal Muscle Relaxants	5	Department of Basic and Clinical Pharmacology and Toxicology

S3	Adrenoceptor Agonists & Sympathomimetic Drugs, Adrenoceptor Antagonist Drugs	5	Department of Basic and Clinical Pharmacology and Toxicology
S4	Antipsychotic Agents & Lithium; Antidepressant Agents; Drugs Used in Alzheimer's disease	5	Department of Basic and Clinical Pharmacology and Toxicology
S5	General Anesthetics; Local Anesthetics; Pharmacologic Management of Parkinsonism & Other Movement Disorders	5	Department of Basic and Clinical Pharmacology and Toxicology
S6	Drugs Used in Asthma; Histamine, Serotonin & the Ergot Alkaloids: H1-Receptor Antagonists	5	Department of Basic and Clinical Pharmacology and Toxicology
S7	Drugs Used in Disorders of Coagulation; Agents Used in Cytopenias; Hematopoietic Growth Factors	5	Department of Basic and Clinical Pharmacology and Toxicology
S8	Drugs Used in Heart Failure; Agents Used in Cardiac Arrhythmias	5	Department of Basic and Clinical Pharmacology and Toxicology
S9	Vasodilators & the Treatment of Angina Pectoris; Agents Used in Dyslipidemia	5	Department of Basic and Clinical Pharmacology and Toxicology
S10	Hypothalamic & Pituitary Hormones; Thyroid & Antithyroid Drugs; Adrenocorticosteroids & Adrenocortical Antagonists	5	Department of Basic and Clinical Pharmacology and Toxicology
S11	The Gonadal Hormones/Inhibitors; Agents that Affect Bone Mineral Homeostasis	5	Department of Basic and Clinical Pharmacology and Toxicology
S12	Pancreatic Hormones & Antidiabetic Drugs; Drugs Used in the Treatment of Gastrointestinal Diseases	5	Department of Basic and Clinical Pharmacology and Toxicology
S13	Beta-Lactam and Other Cell Wall- & Membrane-Active Antibiotics; Tetracyclines, Macrolides, Clindamycin, Chloramphenicol, Streptogramins, & Oxazolidinones; Aminoglycosides & Spectinomycin; Sulfonamides, Trimethoprim & Quinolones	5	Department of Basic and Clinical Pharmacology and Toxicology
S14	Antimycobacterial Drugs; Antifungal Agents; Antiviral Agents; Antiprotozoal Drugs; Clinical Pharmacology of the Antihelminthic Drugs	5	Department of Basic and Clinical Pharmacology and Toxicology
S15	Miscellaneous Antimicrobial Agents; Disinfectants, Antiseptics, & Sterilants; Cancer Chemotherapy; Immunopharmacology	5	Department of Basic and Clinical Pharmacology and Toxicology
S16	Over-the-Counter drugs; Dietary Supplements; Herbal Remedies; Homeopathic Remedies	5	Department of Basic and Clinical

			Pharmacology and Toxicology
S17	Vaccines; Immune Globulins and Other Complex Biologic Products	5	Department of Basic and Clinical Pharmacology and Toxicology
	Total	85	

	PRACTICALS (topics)	Teaching hours	Venue
SP1	Diuretic Agents; Antihypertensive Agents	5	Department of Basic and Clinical Pharmacology and Toxicology
P1	Pharmacography: Drug Formulations (Pharmaceutical Formulations); Pharmaceutical Formulations as Systems for Drug Administration; General Drug Prescription Guidelines; Prescribing "Apothecary" and Galenic Preparations	5	Department of Basic and Clinical Pharmacology and Toxicology
P2	Pharmacography: Prescribing Finished Drug Products	5	Department of Basic and Clinical Pharmacology and Toxicology
	Total	15	

	FINAL EXAM DATES
1.	June 17, 2022
2.	July 1, 2022
3.	July 15, 2022
4.	September 5, 2022
5.	September 19, 2022