SVEUČILIŠTE U RIJECI - MEDICINSKI FAKULTET
UNIVERSITY OF RIJEKA - FACULTY OF MEDICINE

MEDRI

PHARMACOLOGY

(15 pages)

Faculty of Medicine, University of Rijeka
Course: Pharmacology
Course coordinator: Kristina Pilipović, MD, PhD, Associate Professor
Department: Department of Pharmacology
Study program: Integrated Undergraduate and Graduate University Study of Medicine in English
Year: third
Academic year: 2020/2021

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 basic 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:

L1 Introductory Lecture; Pharmacology - Disciplines
Learning outcomes:
To receive basic information about the course, schedule, teaching, and assessment.
To list, define, and explain pharmacology disciplines.

L2 Drug Discovery and Development (Preclinical Trials, Phases 1, 2, and 3 of Clinical Trials)
Learning outcomes:
To define and explain the process and the phases of drug discovery and development.

L3 Drug Nomenclature; Drug Administration and Absorption; Transfer of Drugs Across Cell Membranes
Learning outcomes:
To list and explain the characteristics of different drug names.
To define, describe, and explain different routes of drug administration.
To describe and explain the absorption of drugs following different routes of administration.
To list, describe, and explain different types of drug transfer across cell membranes.

L4 Distribution, Biotransformation, and Elimination of Drugs
Learning outcomes:
To describe and explain the distribution of drugs in the blood and tissues.
To describe and explain different reactions included in the process of drug biotransformation.
To list, describe, and explain different modes of drug elimination.

L5 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.

L6 Drugs Acting on Noradrenergic Transmission

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.

L7 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.

L8 Pharmacology and Recent Advances in Pain Management
Learning outcomes:
To describe the basics of pain pharmacotherapy, including the main indications and contraindications, as well as the prevention and treatment of side effects emerging from the use of commonly used analgesics. To obtain knowledge of the most recent advances in pharmacological pain management.

L9 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.

L10 Drugs Used to Treat Parkinson's Disease; Sedative-Hypnotic 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.

The list of seminars with topics and learning outcomes:

S1 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.

S2 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.

S3 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.

S4 Antipsychotic Agents & Lithium; Antidepressant 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.

S5 Opioid Agonists & Antagonists; 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.

S6 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.

S7 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.

S8 Drugs Used in Asthma; Histamine, Serotonin & the Ergot Alkaloids: H_1-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.

S9 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.

S10 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.

S11 Vasodilatators & 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.

S12 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.

S13 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.

S14 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.

S15 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.

S16 Antimycobacterial Drugs; Antifungal Agents; Antiviral Agents; Antiprotozoal Drugs; Clinical Pharmacology of the Antihelminthic 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.

S17 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.

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

SP1 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.

P1 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.

P2 Pharmacography: Prescribing Finished Drug Products

Learning outcomes:

To acquire the skill of prescibing 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 of Pharmacology.

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

Student grading will be conducted according to the current Ordinance on Studies of the University of Rijeka (approved by the Senate) and the Ordinance on Student Grading at the Faculty of Medicine in Rijeka (approved by the Faculty Council).
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, as follows:

Midterm exam I	35 points
Midterm exam II	35 points
Total (classes)	70 points
Final exam	30 points
Total (course)	100 points

A. Midterm exam I includes the topics covered at L1-L10 and S1-S7. It consists of a written (Test I) and an oral part. Each part of the midterm exam I must be evaluated positively in order to pass the exam!

Test I is evaluated according to the scheme:

Number of correct answers	Number of points
46 - 50	10
41 - 45	9
36 - 40	8
31 - 35	7
26 - 30	6
20 - 25	5

Oral part of the midterm exam I: The maximum number of points at the midterm exam I is 25 (range 12.5-25). For the grade 2 (sufficient), the student obtains 12.5 points; for the grade 3 (good), the student obtains 16 points; for the grade 4 (very good), the student obtains 20 points; for the grade 5 (excellent), the student obtains 25 points.
Test I will be held on January 11, 2021. The exact time and the venues will be announced later on the SharePoint portal of the Department of Pharmacology. The oral part of the midterm exam I will be done in agreement with the students.

Midterm exam II includes the topics covered at S8-S17 and SP1. It consists of a written (Test II) and an oral part. Each part of the midterm exam II must be evaluated positively in order to pass the exam! **Test II** is

evaluated according to the above-mentioned scheme for the Test I of the midterm exam I. Also, the oral part of the midterm exam II is evaluated by the same above mentioned modus for the oral part of the midterm exam I.
Test II will be held on May 24, 2021. The exact time and the venues will be announced later on the SharePoint portal of the Department of Pharmacology. The oral part of the partial exam II will be done in agreement with the students.

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 Test I will be organized on June 23, 2021 and of the **Test II** on June 25, 2021. 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 15, 2021 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 submitt a written explanation and appropriate documentation. The materials have to be headed to Associate Professor Kristina Pilipović, recorded in the Registry Office of the Faculty and submitted to the Office of the Department of Pharmacology, until June 12, 2021 at 3 p.m.

B. Final exam
A student who obtains at least 35 grade points during all course classes can access the final exam. A student who obtains less than 35 grade points during classes must re-enroll the course in the following academic year.

The final exam consists of three parts: written examination of knowledge in Pharmacography, final test, and the oral exam. Each part of the final exam must be evaluated positively in order to pass the exam!

On the written part of the Pharmacography exam, students will have to correctly prescribe 4 prescriptions. The final test can be accessed only by a student who properly prescribes at least 2 prescriptions. For each properly prescribed prescription, the student will receive 0.25 points (maximum 1 point).

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: at the beginning of the oral part of the final exam, knowledge in Pharmacography will be examined. Students are obligated to pass the oral part of Pharmacography in order to continue with the 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 2020 when it was not possible to predict the epidemiological situation regarding the development of the novel coronavirus pandemic in the academic year 2020/2021. 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 of Pharmacology.
The first lecture will be held online on Wednesday, October 7, 2020, 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 Lectures 2020". 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 2020/2021

Date	Lectures (time and venue)	Seminars (time and venue)	Practicals (time and venue)	Lecturer
7.10.2020.	L1 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Kristina Pilipović, MD, PhD, Associate Professor
14.10.2020.	L2 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Dinko Vitezić, MD, PhD, Full Professor
21.10.2020.	L3 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Jasenka Mršić Pelčić, MD, PhD, Full Professor
28.10.2020.	L4 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Kristina Pilipović, MD, PhD, Associate Professor
2.11.2020		S1A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
3.11.2020.		S1B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
4.11.2020.	L5 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Kristina Pilipović, MD, PhD, Associate Professor
9.11.2020.		S2A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
10.11.2020.		S2B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
11.11.2020.	L6 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Kristina Pilipović, MD, PhD, Associate Professor
16.11.2020.		S3A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
17.11.2020.		S3B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
18.11.2020. National holiday	L7 (12^{15}-15^{00}) Lecture will be organized in agreement with the students.			Dinko Vitezić, MD, PhD, Full Professor
23.11.2020.		S4A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Dinko Vitezić, MD, PhD, Full Professor
24.11.2020.		S4B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Dinko Vitezić, MD, PhD, Full Professor
25.11.2020.	L8 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Kristina Pilipović, MD, PhD, Associate Professor
30.11.2020.		S5A (8^{15}-12^{00})		Nika Gržeta, MA in Medical Biotechnology, Teaching

		Online seminar (Microsoft Teams)		Assistant
1.12.2020.		S5B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
2.12.2020.	L9 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Jasenka Mršić Pelčić, MD, PhD, Full Professor
7.12.2020.		S6A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
8.12.2020.		S6B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
9.12.2020.	L10 (8^{15}-11^{00}) Online lecture (Microsoft Teams)			Kristina Pilipović, MD, PhD, Associate Professor
14.12.2020.		S7A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Jasenka Mršić Pelčić, MD, PhD, Full Professor
15.12.2020.		S7B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Jasenka Mršić Pelčić, MD, PhD, Full Professor
11.1.2021.	**Partial exam I**			
18.1.2021.		S8A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
19.1.2021.		S8B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
25.1.2021.		S9A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
26.1.2021.		S9B (12^{15}-16^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
2.3.2021.			SP1A (8^{15}-12^{00}) Department of Pharmacology	Dinko Vitezić, MD, PhD, Full Professor
2.3.2021.			SP1B (13^{15}-17^{00}) Department of Pharmacology	Dinko Vitezić, MD, PhD, Full Professor
9.3.2021.		S10A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Kristina Kampić, MD
9.3.2021.		S10B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Kristina Kampić, MD
16.3.2021.		S11A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Kristina Kampić, MD
16.3.2021.		S11B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Kristina Kampić, MD
23.3.2021.		S12A (8^{15}-12^{00})		Kristina Pilipović, MD, PhD, Associate Professor

		Online seminar (Microsoft Teams)		
23.3.2021.		S12B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
30.3.2021.		S13A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
30.3.2021.		S13B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
6.4.2021.		S14A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
6.4. 2021.		S14B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
13.4.2021.		S15A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Vera Vlahović-Palčevski, MD, PhD, Full Professor
13.4. 2021.		S15B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Vera Vlahović-Palčevski, MD, PhD, Full Professor
20.4.2021.		S16A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
20.4.2021.		S16B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Kristina Pilipović, MD, PhD, Associate Professor
27.4.2021.		S17A (8^{15}-12^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
27.4.2021.		S17B (13^{15}-17^{00}) Online seminar (Microsoft Teams)		Nika Gržeta, MA in Medical Biotechnology, Teaching Assistant
4.5.2021.			P1A (8^{15}-12^{00}) P1B (8^{15}-12^{00}) Department of Pharmacology	Kristina Pilipović, MD, PhD, Associate Professor Jasenka Mršić Pelčić, MD, PhD, Full Professor
4.5.2021.			P1C (13^{15}-17^{00}) P1D (13^{15}-17^{00}) Department of Pharmacology	Kristina Pilipović, MD, PhD, Associate Professor Jasenka Mršić Pelčić, MD, PhD, Full Professor
11.5.2021.			P2A (8^{15}-12^{00}) P2B (8^{15}-12^{00}) Department of Pharmacology	Dinko Vitezić, MD, PhD, Full Professor Kristina Pilipović, MD, PhD, Associate Professor
11.5.2021.			P2C (13^{15}-17^{00}) P2D (13^{15}-17^{00}) Department of Pharmacology	Dinko Vitezić, MD, PhD, Full Professor Kristina Pilipović, MD, PhD, Associate Professor
24.5.2021.	**Partial exam II**			

List of lectures, seminars and practicals

	LECTURES (topics)	Teaching hours	Venue
L1	Introductory Lecture Pharmacology - disciplines	3	Online lecture (Microsoft Teams)
L2	Drug Discovery and Development (Preclinical Trials, Phases 1, 2, and 3 of Clinical Trials)	3	Online lecture (Microsoft Teams)
L3	Drug Nomenclature Drug Administration and Absorption Transfer of Drugs Across Cell Membranes	3	Online lecture (Microsoft Teams)
L4	Distribution, Biotransformation, and Elimination of Drugs	3	Online lecture (Microsoft Teams)
L5	Drugs and Organism Characteristics Affecting Drug Activity; Allergic and Idiosyncratic Reactions	3	Online lecture (Microsoft Teams)
L6	Drugs Acting on Noradrenergic Transmission	3	Online lecture (Microsoft Teams)
L7	Antipsychotic Agents Drugs Used to Treat Alzheimer's Diseases	3	Online lecture (Microsoft Teams)
L8	Pharmacology and Recent Advances in Pain Management	3	Online lecture (Microsoft Teams)
L9	Drugs of Abuse	3	Online lecture (Microsoft Teams)
L10	Drugs Used to Treat Parkinson's Disease Sedative-Hypnotic Drugs	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	Online lecture (Microsoft Teams)
S2	Cholinoceptor-Activating & Cholinesterase-Inhibiting Drugs; Cholinoceptor-Blocking Drugs; Skeletal Muscle Relaxants	5	Online lecture (Microsoft Teams)
S3	Adrenoceptor Agonists & Sympathomimetic Drugs, Adrenoceptor Antagonist Drugs	5	Online lecture (Microsoft Teams)
S4	Antipsychotic Agents & Lithium; Antidepressant Agents	5	Online lecture (Microsoft Teams)
S5	Opioid Agonists & Antagonists; Nonsteroidal Anti-Inflammatory Drugs; Disease-Modifying Antirheumatic Drugs; Nonopioid Analgesics & Drugs Used in Gout	5	Online lecture (Microsoft Teams)
S6	General Anesthetics; Local Anesthetics; Pharmacologic Management of Parkinsonism & Other Movement Disorders	5	Online lecture (Microsoft Teams)
S7	Sedative-Hypnotic Drugs; Antiseizure Drugs	5	Online lecture (Microsoft Teams)
S8	Drugs Used in Asthma; Histamine, Serotonin & the Ergot Alkaloids: H_1-Receptor Antagonists	5	Online lecture (Microsoft Teams)
S9	Drugs Used in Disorders of Coagulation; Agents Used in Cytopenias; Hematopoietic Growth Factors	5	Online lecture (Microsoft Teams)
S10	Drugs Used in Heart Failure; Agents Used in Cardiac Arrhythmias	5	Online lecture (Microsoft Teams)
S11	Vasodilatators & the Treatment of Angina Pectoris; Agents Used in Dyslipidemia	5	Online lecture (Microsoft Teams)
S12	Hypothalamic & Pituitary Hormones; Thyroid & Antithyroid Drugs; Adrenocorticosteroids & Adrenocortical Antagonists	5	Online lecture (Microsoft Teams)

S13	The Gonadal Hormones/Inhibitors; Agents that Affect Bone Mineral Homeostasis	5	Online lecture (Microsoft Teams)
S14	Pancreatic Hormones & Antidiabetic Drugs; Drugs Used in the Treatment of Gastrointestinal Diseases	5	Online lecture (Microsoft Teams)
S15	Beta-Lactam and Other Cell Wall- & Membrane-Active Antibiotics; Tetracyclines, Macrolides, Clindamycin, Chloramphenicol, Streptogramins, & Oxazolidinones; Aminoglycosides & Spectinomycin; Sulfonamides, Trimethoprim & Quinolones	5	Online lecture (Microsoft Teams)
S16	Antimycobacterial Drugs; Antifungal Agents; Antiviral Agents; Antiprotozoal Drugs; Clinical Pharmacology of the Antihelminthic Drugs	5	Online lecture (Microsoft Teams)
S17	Miscellaneous Antimicrobial Agents; Disinfectants, Antiseptics, & Sterilants; Cancer Chemotherapy; Immunopharmacology	5	Online lecture (Microsoft Teams)
	Total	**85**	

	PRACTICALS (topics)	**Teaching hours**	**Venue**
SP1	Diuretic Agents; Antihypertensive Agents	5	Department of Pharmacology
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 Pharmacology
P2	Pharmacography: Prescibing Finished Drug Products	5	Department of Pharmacology
	Total	**15**	

	FINAL EXAM DATES
1.	June 14, 2021
2.	June 28, 2021
3.	July 12, 2021
4.	September 9, 2021
5.	September 23, 2021