Sveučilište u Rijeci
University of Rijeka

Sveučilište u Rijeci • Fakultet dentalne medicine
University of Rijeka • Faculty of Dental Medicine
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Course: Pharmacology
Course Coordinator: Prof Kristina Pilipović, MD, PhD
Course Collaborators: Asst Prof Petra Dolenec, MA in Biol., PhD
Asst Prof Anja Harej Hrkać, MA in Med. Biotech., PhD
Iva Kristić, MA in S.E.
Ena Kramarić, M. Pharm
Department: Department of Basic and Clinical Pharmacology and Toxicology
Study program: University Integrated Undergraduate and Graduate Study of Dental Medicine (in English)
Study year: 2
Academic year: 2025/2026

SYLLABUS

Course description (a brief description of the course, general instructions, where and in 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 second year of the Integrated Undergraduate and Graduate University Study of Dental Medicine and consists of 20 hours of lectures, 10 hours of practicals, and 45 hours of seminars, which makes a total of 75 hours of teaching (6.0 ECTS).
The aims of the course are to acquaint students with the basic principles of general and special pharmacology and rational pharmacotherapy, with special reference to the preparations used in dental practice. The planned outcome of the course is to enable students to acquire basic knowledge in the field of pharmacodynamics, pharmacokinetics and toxicology of individual drugs, prescription-writing skills for different forms of drugs and knowledge that will allow them to choose the right drug in clinical dental practice. The acquired knowledge should also enable an understanding of the use of drugs for various medical indications, which could interfere with dental diseases or cause oral side effects.

Assigned reading:

- Dowd FJ, Johnson BS, Mariotti AJ. Pharmacology and Therapeutics for Dentistry, 7th Edition, Mosby, St. Louis, MO, USA, 2017.
- Bradamante V, Klarica M, Šalković-Petrišić M, Edits. Pharmacology Manual, 1st Edition in English, Medicinska naklada, Zagreb, 2010.

Optional/additional reading:

- Katzung BG, Edit., Basic & Clinical Pharmacology, 14th Edition, McGraw-Hill Education, New York, USA, 2018.
- 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 descriptions):

Lecture 1
Introductory Lecture: Definition and Division of Pharmacology. Origin, names, and classification of drugs.
Learning outcomes

To be acquainted with the content, aims and the Syllabus for the course. To know students' rights and obligations. To be able to define and explain certain disciplines of pharmacology. To be able to explain the features of the names of medicines.

Lecture 2

Pharmacokinetics: Absorption and Distribution of Drugs

Learning outcomes

Be able to list the main ways of application of drugs, list their features and compare them. Explain how drugs can pass through body membranes. Have knowledge about the distribution of drugs in the blood and tissues.

Lecture 3

Pharmacokinetics: Biotransformation and Elimination of Drugs

Learning outcomes

Know and explain the reactions involved in the process of biotransformation of drugs. Be able to list and describe the main routes of drug elimination.

Lecture 4

Factors Affecting Drug Activity in the Body

Learning outcomes

Be able to explain the drug characteristics that affect its activity in the body (chemical structure, quantity, dose, concentration, method and time of drug administration, rate of application, forms of medicinal preparation). Be able to explain the characteristics of the organism that affect the activity of the drug (age, weight, sex). Understand and explain the types and causes of drug hypersensitivity.

Lecture 5

Drug Research and Development. Side effects and toxicology.

Learning outcomes

Be able to define and explain the development process and individual phases of research of new drugs.

Lecture 6

Pharmacodynamics: Mechanisms of Drug Action

Learning outcomes

Have knowledge and be able to clearly define the main determinants of the mechanisms of action of drugs.

Lecture 7

Use of Drugs in Pregnant and Lactating Women

Learning outcomes

Know and explain the ways in which pregnancy affects pharmacokinetic and pharmacodynamic processes when using drugs. Be able to explain the potential teratogenic effects of drugs used in pregnancy. Explain the factors that affect the passage of drugs into breast milk and know which drugs, which are used during breastfeeding, are known to cause or may potentially cause adverse effects in children.

Lecture 8

Local Anesthetics; General Anesthesia

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of local and general anesthetics.

The list of seminars with descriptions:

Seminar 1

Cholinergic Agonists and Muscarinic Receptor Antagonists; Drugs Affecting Nicotinic Receptors

Learning outcomes

Understand and explain the effects of the use of agonists and antagonists of cholinergic receptors as well as indirect drugs with action on cholinergic activity.

Seminar 2

Adrenergic Agonists and Antagonists

Learning outcomes

Understand and explain the effects of adrenergic receptor agonists and antagonists as well as indirect drugs with action on adrenergic activity.

Seminar 3

Opioid Analgesics and Antagonists

Learning outcomes

Explain the molecular mechanisms of action of drugs of certain groups of analgesics. List the types of opioid receptors and describe their functional roles. List the harmful effects of opioids, explain the main drug interactions, list the main contraindications to the use of morphine and its analogues, describe the characteristics of opioid tolerance and opioid dependence.

Seminar 4

Non-Opioid Analgesics; Nonsteroidal Anti-inflammatory and Antirheumatic Drugs

Learning outcomes

Distinguish details and differences of mechanisms of action, application, side effects and toxicity of individual nonsteroidal anti-inflammatory drugs.

Seminar 5

Anticonvulsants; Antiparkinsonian Drugs

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of sedatives-hypnotics and anxiolytics.

Seminar 6

Psychopharmacology: Antipsychotic and Antidepressant Drugs

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of antipsychotics and antidepressants.

Seminar 7

Sedative-Hypnotics and Antianxiety Drugs

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of anticonvulsants and antiparkinsonian drugs.

Seminar 8

Antianemic and Hematopoietic Stimulating Drugs; Anticoagulant, Antiplatelet, and Thrombolytic Drugs

Learning outcomes

Describe and explain the methods of administration of drugs with action on the blood and hematopoietic organs, mechanisms of their action, pharmacological effects, main indications, contraindications, side effects and toxicity of individual drugs that are illustrative examples of pharmacotherapeutic groups and

subgroups. Analyze pharmacological effects, pharmacokinetic profile, adverse effects, indications and contraindications among drugs from different subgroups within the same drug group, and compare them with each other.

Seminar 9

Drugs Acting on the Respiratory System; Histamine and Histamine Antagonists

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of drugs used for pharmacotherapy of respiratory diseases and agents that act on the histamine system.

Seminar 10

Drugs Acting on the Gastrointestinal Tract

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of drugs used for pharmacotherapy of diseases of the digestive system.

Seminar 11

Drugs Acting on Cardiovascular Diseases I: Antiarrhythmic Drugs; Antianginal Drugs; Lipid-Lowering Drugs Learning outcomes

Explain the mechanisms of action of the most commonly used antiarrhythmics. Know the most significant side effects and toxic effects of individual representatives of different groups of antiarrhythmics and drugs used in the treatment of angina pectoris. Describe the action of each class of hypolipidemics on serum lipid levels and describe and compare their mechanisms of action. Know the advantages and disadvantages of using combinations of hypolipidemics.

Seminar 12

Drugs Acting on Cardiovascular Diseases II: Diuretic Drugs; Antihypertensive Drugs; Drugs Used In Heart Failure;

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics of drugs used to treat heart failure. Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of drugs used in the treatment of hypertension and diuretics.

Seminar 13

Adrenal Corticosteroids; Bone Metabolism

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of adrenal cortex hormones, as well as their synthetic agonists and antagonists. Know and explain main characteristic of the drugs with act upon the bone metabolism.

Seminar 14

Steroid Hormones of Reproduction and Sexual Development

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of gonadotropins and sex hormones, as well as drugs that affect the reproductive system.

Seminar 15

Insulin, Oral Hypoglycemics, and Glucagon; Pituitary, Thyroid and Parathyroid Pharmacology

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of drugs for the treatment of diabetes mellitus. Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of drugs for the treatment of thyroid disease.

Seminar 16

Antibacterial Drugs I: Beta-Lactamases, Glycopeptides, Sulfonamides, Trimethoprim, Fluoroquinolones

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of beta-lactamate, glycopeptides, sulfonamides, trimethoprim, fluoroquinolones.

Seminar 17

Antibacterial Drugs II: Aminoglycosides, Tetracyclines, Chloramphenicol, Macrolides, Clindamycin, Metronidazole

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects aminoglycosides, tetracyclines, chloramphenicol, macrolides, clindamycin, and metronidazole.

Seminar 18

Antibacterial Drugs III: Antituberculotics; Antifungals; Antivirals

Learning outcomes

Explain the main pharmacodynamic and pharmacokinetic characteristics and the most significant side effects of antituberculotics, antifungals and antivirals.

The list of practicals with descriptions:

Practical 1

Antiseptics and Disinfectants. Medicines for Topical Use in Dentistry; Fluorides and Preparations for Oral Hygiene

Learning outcomes

List and describe the most important antiseptics and disinfectants. Explain the main characteristics and the most significant side effects of topical medications in dentistry, fluoride and oral hygiene products.

Practical 2

Prescription Writing I

Learning outcomes

Be able to explain what a recipe is, its parts, ways of prescribing recipes. Be able to define general guidelines and rules for prescribing medications. Know certain types of pharmacological preparations. Get acquainted with the skill of prescribing recipes for magistral and galenic preparations.

Practical 3

Prescription Writing II

Learning outcomes

Define the classification of medicines, know how to prescribe prescriptions for finished drugs and for various forms of medicinal preparations.

Students' obligations:

Students are obligated to regularly attend and actively participate in classes. It is compulsory to follow and act in accordance with notifications and rules regarding attendance, absence, partial exams, corrections of

partial 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 Merlin platform.

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

During the classes, students can achieve a maximum of 50 % (50 points) of the final grade from the course, and the other 50 % of the grade (50 points) is achieved at the final exam.
From the classes, different activities are scored:
A. acquired knowledge on partial tests: it is possible to achieve 15 points at each of the partial tests, which makes a maximum of 45 points in total, and
B. colloquium in pharmacography: 5 points maximum.
The total maximum sum of points that can be achieved during classes and at the final exam is as follows:

Classes	Partial test I	15
	Partial test II	15
	Partial test III	15
	Colloquium in Pharmacography	5
Total (course)		**50**
Final exam		**50**
	Total points	**100**

A. Partial tests
Test I covers topics in the Syllabus L1-7. Test I will be taken on **June 10, 2026**.
Test II covers topics in the Syllabus L8, S1-7. Test II will be taken on **June 18, 2026**.
Test III covers topics in the Syllabus S8-18, P1. Test III will be taken on **June 29, 2026**.
On partial tests, points will be earned according to the following schemes:

Number of correct answers	Number of points
20	15
19	14
18	13
17	12
16	11
14-15	10
12-13	9
10-11	8
0-9	0

Corrections of partial tests will be organized for students who did not pass them as well as for students who want to improve the number of points gained by taking previous tests. In the latter case, the number of points earned on the correction will be counted as the final result! Test corrections will also be organized for students who did not access them, for which they should have a justifiable reason. Corrections of the tests will be organized in the week of **July 6-10, 2026**, in the same form as the tests themselves, and the exact time and manner of holding the corrections will be agreed upon subsequently with the students.

B. Colloquium in Pharmacography

The pre-exam colloquium in Pharmacography includes the material of practicals **P3-P3**. This exam is **written** and consists of a part in which students will have to write 5 prescriptions (0.5 points per prescription, maximum 2.5 points) and a part in which students will have to answer questions related to the theoretical part of Pharmacography (maximum number of points 2.5). In order to be considered passed, the student will need to correctly write at least 2 prescriptions and answer at least 40% of the theoretical questions correctly.

Students who are not satisfied with the result achieved at the pre-exam colloquium in Pharmacography can try to correct it 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! The terms for the pre-exam colloquia in Pharmacography are **July 2, 2026, July 16, 2026, July 30, 2026, September 2, 2026 and September 16, 2026**. The times and places will be announced later on the Merlin e-learning platform.

C. Final exam

Only the students who have achieved **at least 25 points** during the course can take the final exam in Pharmacology, in accordance with the Regulations on Studies of the University of Rijeka. Students who achieved less than 50% of the points that could be achieved during the course (i.e., less than 25 points), do not have the right to take the final exam and are graded F (unsuccessful), cannot gain ECTS credits and must again enter the course.

The final exam consists of a written and an oral part. Each part of the final exam must be positively graded in order for the exam to be considered passed! The written part of the final exam is graded according to the scheme:

Number of correct answers	Number of points
49-50	20
47-48	19
45-46	18
43-44	17
41-42	16
39-40	15
37-38	14
34-36	13
31-33	12
28-30	11
25-27	10
0-24	0

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

The oral part of the final exam is mandatory for all students! The maximum number of points obtained in the oral exam is 30. For a grade sufficient in this part of the exam, the student gets 15, for a grade of good 20, for a grade of very good 25, and for a grade of excellent 30 points.

Final grade

The final grade is formed based on the results obtained during the class, and the grade obtained at the final exam as follows:

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 (insufficient)	F

Other important information regarding to the course:

Course content and information related to the course will be regularly published via Merlin e-learning platform.

Any utilization of external text or creative work, along with the employment of tools like ChatGPT or any AI-based technology, must be accompanied by a transparent and unequivocal citation of the source. Failure to do so constitutes an infringement upon copyright, academic integrity principles, and student rights. This transgression carries the weight of disciplinary accountability and will result in appropriate measures in line with the regulations stipulated in the Rulebook on Student Disciplinary Responsibility.

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COURSE SCHEDULE (for the academic year 2025/2026)

Date	Lectures (time and place)	Seminars (time and place)	Practicals (time and place)	Instructor
02/06/2026	L1 (8:30-10:00) Lecture room			Prof Kristina Pilipović, MD, PhD
	L2 (10:15-12:30) Lecture room			Asst Prof Petra Dolenec, MA in Biol., PhD
03/06/2026	L3 (8:30-10:00) Lecture room			Asst Prof Petra Dolenec, MA in Biol., PhD
	L4 (10:15-12:30) Lecture room			Prof Kristina Pilipović, MD, PhD
08/06/2026	L5 (8:30-10:00) Lecture room			Prof Kristina Pilipović, MD, PhD
	L6 (10:15-12:30) Lecture room			Prof Kristina Pilipović, MD, PhD
09/06/2026	L7 (8:30-10:00) Lecture room			Asst Prof Anja Harej Hrkać, MA in Med. Biotech., PhD
10/06/2026	Partial test I (8:00-9:00)			
10/06/2026	L8 (9:15-10:30)			Asst Prof Anja Harej Hrkać, MA in Med. Biotech., PhD
11/06/2026		S1 (8:30-10:45) Lecture room		Ena Kramarić, MPharm
12/06/2026		S2 (8:30-10:45) Lecture room		Iva Kristić, MA in S.E.
		S3 (11:00-12:30) Lecture room		Iva Kristić, MA in S.E.
15/06/2026		S4 (8:30-10:45) Lecture room		Ena Kramarić, MPharm
		S5 (11:00-12:30) Lecture room		Iva Kristić, MA in S.E.
16/06/2026		S6 (8:30-10:45) Lecture room		Ena Kramarić, MPharm
		S7 (11:00-12:30) Lecture room		Iva Kristić, MA in S.E.
18/06/2026	Partial test II (8:00-9:00)			
18/06/2026		S8 (9:15-11:30) Lecture room		Iva Kristić, MA in S.E.
		S9 (11:45-13:15) Lecture room		Iva Kristić, MA in S.E.
19/06/2026		S10 (8:30-10:45) Lecture room		Ena Kramarić, MPharm
		S11 (11:00-12:30) Lecture room		Ena Kramarić, MPharm
23/06/2026		S12 (8:30-10:45) Lecture room		Ena Kramarić, MPharm
		S13 (11:00-12:30) Lecture room		Ena Kramarić, MPharm

24/06/2026		S14 (8:30-10:45) Lecture room		Iva Kristić, MA in S.E.
		S15 (11:00-12:30) Lecture room		Ena Kramarić, MPharm
25/06/2026		S16 (8:30-10:45) Lecture room		Iva Kristić, MA in S.E.
		S17 (11:00-12:30) Lecture room		Ena Kramarić, MPharm
26/06/2026		S18 (8:30-10:45) Lecture room		Iva Kristić, MA in S.E.
			P1 (11:00-13:15) Lecture room	
29/06/2026	Partial test III (8:00-9:00)			
29/06/2026			P2 (9:15-11:30) Lecture room	
30/06/2026			P3 (8:30-11:30) Lecture room	

List of lectures, seminars and practicals:

	LECTURES (Topics)	Teaching hours	Location/Lecture room
L1	Introductory Lecture: Definition and Division of Pharmacology; Origin, Names, and Classification of Drugs	2	
L2	Pharmacokinetics: Absorption and Distribution of Drugs	3	
L3	Pharmacokinetics: Biotransformation and Elimination of Drugs	2	
L4	Factors Affecting Drug Activity in the Body	3	
L5	Drug Research and Development. Side effects and toxicology	2	
L6	Pharmacodynamics: Mechanisms of Drug Action	3	
L7	Use of Drugs in Pregnant and Lactating Women	2	
L8	Local Anesthetics; General Anesthesia	3	
	TOTAL TEACHING HOURS	**20**	

	SEMINARS (Topics)	Teaching hours	Location/Lecture room
S1	Cholinergic Agonists and Muscarinic Receptor Antagonists; Drugs Affecting Nicotinic Receptors	3	
S2	Adrenergic Agonists and Antagonists	3	
S3	Opioid Analgesics and Antagonists	2	
S4	Non-Opioid Analgesics; Nonsteroidal Anti-inflammatory and Antirheumatic Drugs	3	
S5	Anticonvulsants; Antiparkinsonian Drugs	2	
S6	Psychopharmacology: Antipsychotic and Antidepressant Drugs	3	
S7	Sedative-Hypnotics and Antianxiety Drugs	2	
S8	Antianemic and Hematopoietic Stimulating Drugs; Anticoagulant, Antiplatelet, and Thrombolytic Drugs	3	
S9	Drugs Acting on the Respiratory System; Histamine and Histamine Antagonists	2	

S10	Drugs Acting on the Gastrointestinal Tract	2	
S11	Drugs Acting on Cardiovascular Diseases I: Antiarrhythmic Drugs; Antianginal Drugs; Lipid-Lowering Drugs	3	
S12	Drugs Acting on Cardiovascular Diseases II: Diuretic Drugs; Antihypertensive Drugs; Drugs Used in Heart Failure;	3	
S13	Adrenal Corticosteroids; Bone Metabolism	2	
S14	Steroid Hormones of Reproduction and Sexual Development	2	
S15	Insulin, Oral Hypoglycemics, and Glucagon; Pituitary, Thyroid and Parathyroid Pharmacology	2	
S16	Antibacterial Drugs I: Beta-Lactams, Glycopeptides, Sulfonamides, Trimethoprim, Fluoroquinolones	2	
S17	Antibacterial Drugs II: Aminoglycosides, Tetracyclines, Chloramphenicol, Macrolides, Clindamycin, Metronidazole	3	
S18	Antibacterial Drugs III: Antituberculotics; Antifungals; Antivirals	3	
	TOTAL TEACHING HOURS	**45**	

	PRACTICALS (Topics)	**Teaching hours**	**Location/Lecture room**
P1	Antiseptics and Disinfectants; Medicines for Topical Use in Dentistry; Fluorides and Preparations for Oral Hygiene	3	
P2	Prescription Writing I	3	
P3	Prescription Writing II	4	
	TOTAL TEACHING HOURS	10	

	FINAL EXAM DATES
1.	July 3, 2026
2.	July 17, 2026
3.	July 31, 2026
4.	September 5, 2026
5.	September 19, 2026

	Lectures	**Seminars**	**Practicals**	**Total**
Total number	20	45	10	75
Online				
Percentage				