PHARMACOLOGY AND TOXICOLOGY

THIRD YEAR OF STUDIES

School year 2024/2025.

Subject:

PHARMACOLOGY AND TOXICOLOGY

The subject is valued with 12 ESCT. There are 4 hours of active classes per week (2 hours of lectures and 2 hours of exercises).

TEACHERS AND ASSOCIATES WHO PARTICIPATE IN TEACHING 2024/25:

RB	Name and surname	E-mail address	Title
1.	Slobodan Janković	sjankovic @ fmn.kg.ac.rs	Professor
2 .	Dragan Milovanovic	piki@ptt.rs	Professor
3.	Nataša Đorđević	natashadj2002@yahoo.com	Professor
4.	Jasmina Milovanović	jasminamilo@yahoo.com	Professor
5.	Dejana Ruzic Zecevic	dejana.zecevic@gmail.com	Associated Professor
6.	Marina Kostić	marrina2006kg@yahoo.com	Professor
7.	Mihajlo Jakovljević	jakovljevicm @ medf.kg.ac.rs	Professor
8.	Radica Zivković Zarić	radica_zivkovic@yahoo.com	Assistant Professor
9.	Miloš Milosavljević	milosavljevicmilos91@gmail.com	Assistant Professor
10.	Ana Pejcic	anapejcic201502@yahoo.com	Assistant Professor

COURSE STRUCTURE:

Module	**Name of the module**	**Weeks**	**Lectures weekly**	**Work in a small group per week**	**Teacher-leader of the module**
1	GENERAL PHARMACOLOGY AND PHARMACOLOGY OF THE NERVOUS SYSTEM	10	2	2	prof. Dr. Slobodan Janković
2	ORGAN SYSTEM PHARMACOLOGY: • CARDIOVASCULAR SYSTEM • BLOOD AND TISSUES • RESPIRATORY TRACT • GASTROINTESTINAL TRACT • ENDOCRINE SYSTEM	10	2	2	prof. Dr. Slobodan Janković
3	ANTIMICROBIAL DRUGS, CYTOSTATICS, IMMUNOSUPPRESSANTS AND TOXICOLOGY	10	2	2	prof. Dr. Slobodan Janković
					∑60+60=120

ASSESSMENT:

The student masters the subject based on the activities during the class and the oral exam. The grade is equivalent to the number of obtained points (maximum 100). Points are earned in two ways:

ACTIVITY DURING THE LESSON: In this way, the student can earn up to 70 points in the following ways, according to the attached table:

1. 1 point each week if he/she regularly comes to class and participates in lectures and exercises, i.e. maximum 30 points.
2. by answering orally at the end of each module, a maximum of 40 points in total.

MODULE		MAXIMUM POINTS		
		Regular and active attendance of classes	**Oral answering at the end of the module**	**Σ**
1	GENERAL PHARMACOLOGY AND PHARMACOLOGY OF THE NERVOUS SYSTEM	10	15	25
2	ORGAN SYSTEM PHARMACOLOGY: • CARDIOVASCULAR SYSTEM • BLOOD AND TISSUES • RESPIRATORY TRACT • GASTROINTESTINAL TRACT • ENDOCRINE SYSTEM	10	10	20
3	ANTIMICROBIAL DRUGS, CYTOSTATICS, IMMUNOSUPPRESSANTS AND TOXICOLOGY	10	15	25
Σ		30	40	**70**

ORAL EXAMINATION: maximum **30** points.

The final grade is formed as follows:

In order to pass the subject a student must acquire minimum of 51 points .

The number of points earned	Grade
0 - 50	**5**
51 - 60	**6**
61 - 70	**7**
71 - 80	**8**
81 - 90	**9**
91 - 100	**10**

Committee in charge of oral examination:

Regular members: prof. dr Slobodan Janković, prof. dr. Dragan Milovanović, Associated Professor dr Dejana Ružić Zečević,

Reserve members: prof. dr. Jasmina Milovanović, prof. dr. Nataša Đorđević, prof. dr. Mihajlo Jakovljević, prof. dr. Marina Kostić, Assist. Prof. dr. Radica Živković Zarić, Assist. Prof. Ana Pejčić and Assist. Prof. Miloš Milosavljević.

LITERATURE:

MODULE	TITLE OF THE TEXTBOOK	THE AUTHORS	PUBLISHER	LIBRARY	READING ROOM
1. GENERAL PHARMACOLOGY AND PHARMACOLOGY OF THE NERVOUS SYSTEM	Handbook of pharmacology and toxicology	Slobodan M. Jankovic	Faculty of Medical Sciences, Kragujevac, 2021	yes	yes
	Medical pharmacology at a glance	Neal, M. J.	Wiley Blackwell, 2016		
	Manual for practical teaching in pharmacology and toxicology	Slobodan M. Jankovic, editor	Faculty of Medical Sciences, Kragujevac, 2018		
2. PHARMACOLOGY OF THE ORGAN SYSTEM: • **CARDIOVASCULAR SYSTEM** • **BLOOD AND TISSUES** • **RESPIRATORY TRACT** • **GASTROINTESTINAL TRACT** • **ENDOCRINE SYSTEM**	Handbook of pharmacology and toxicology	Slobodan M. Jankovic	Faculty of Medical Sciences, Kragujevac, 2021	yes	yes
	Medical pharmacology at a glance	Neal, M. J.	Wiley Blackwell, 2016		
	Manual for practical teaching in pharmacology and toxicology	Slobodan M. Jankovic, editor	Faculty of Medical Sciences, Kragujevac, 2018		
3. ANTIMICROBIAL DRUGS, CYTOSTATICS, IMMUNOSUPPRESSANTS AND TOXICOLOGY	Handbook of pharmacology and toxicology	Slobodan M. Jankovic	Faculty of Medical Sciences, Kragujevac, 2021	yes	yes
	Medical pharmacology at a glance	Neal, M. J.	Wiley Blackwell, 2016		
	Manual for practical teaching in pharmacology and toxicology	Slobodan M. Jankovic, editor	Faculty of Medical Sciences, Kragujevac, 2018		

Power Point presentations of key lectures are available on the website of the Faculty of Medical Sciences: www.medf.kg.ac.rs

THE PROGRAM:

FIRST MODULE: GENERAL PHARMACOLOGY AND PHARMACOLOGY OF THE NERVOUS SYSTEM

TEACHING UNIT 1 (FIRST WEEK):

GENERAL PHARMACOLOGY

lectures 2 hours	exercises for 2 hours
• Introduction to pharmacology • The effect of drugs on the body	• Relationship between dose and drug effect • Pharmacodynamic drug-drug interactions (antagonism and synergism)

TEACHING UNIT 2 (SECOND WEEK):

GENERAL PHARMACOLOGY

lectures 2 hours	exercises for 2 hours
• Pharmacokinetics	• Calculation of basic pharmacokinetic parameters • Pharmacokinetic drug-drug interactions

TEACHING UNIT 3 (THIRD WEEK):

AUTONOMOUS NERVOUS SYSTEM – PARASYMPATHICUS

lectures 2 hours	exercises for 2 hours
• General pharmacology of neurovegetative transmission • Cholinergic and anticholinergic drugs • Pharmacology of vegetative ganglia	• Effect of cholinergic and anticholinergic drugs on arterial pressure in cats

TEACHING UNIT 4 (FOURTH WEEK):

AUTONOMOUS NERVOUS SYSTEM - SYMPATHICUS

lectures 2 hours	exercises for 2 hours
• Adrenergic drugs • Antiadrenergic drugs • Pharmacology of histamine and serotonin	• Effect of adrenergic drugs on the arterial pressure of the cat

TEACHING UNIT 5 (FIFTH WEEK):

AUTONOMOUS NERVOUS SYSTEM – CLINICAL CASES 1

lectures 2 hours	exercises for 2 hours
Clinical problems: • Insecticide poisoning • Pheochromocytoma • Renal colic	• The influence of adrenergic blockers on the arterial pressure of cats

TEACHING UNIT 6 (SIXTH WEEK):

AUTONOMOUS NERVOUS SYSTEM – CLINICAL CASES 2

lectures 2 hours	exercises for 2 hours
• Pharmacology of neuro-muscular junction Clinical problems: • Allergic reaction type 1 • Glaucoma	• The effect of myorelaxant drugs on striated musculature

UNIT 7 (SEVENTH WEEK):

CENTRAL NERVOUS SYSTEM 1

lectures 2 hours	exercises for 2 hours
• General principles of neurotransmission • Principles of treatment of psychosis • Principles of depression treatment • Treatment of anxiety and insomnia	• Methods of testing psychopharmaceuticals • Acute barbiturate poisoning

UNIT 8 (EIGHTH WEEK):

CENTRAL NERVOUS SYSTEM 2

lectures 2 hours	exercises for 2 hours
• Anesthesia • Treatment of epilepsy • Alcoholism • Epileptic seizure	• Effect of morphine on rabbit respiration

UNIT 9 (NINTH WEEK):

CENTRAL NERVOUS SYSTEM 3

lectures 2 hours	exercises for 2 hours
• Pain therapy • Addiction pharmacology Clinical problems: • Addicted to psychostimulants	• Working with pharmacological databases on the Internet

UNIT 10 (TENTH WEEK):

CENTRAL NERVOUS SYSTEM 4

lectures 2 hours	exercises for 2 hours
Clinical problems: • Adverse effects of antipsychotics • Acute mania • Preparing patients for general anesthesia • Parkinson's disease	• Oral examination of the material from the first 10 weeks

SECOND MODULE: PHARMACOLOGY OF ORGAN SYSTEMS

UNIT 11 (ELEVENTH WEEK):

CARDIOVASCULAR SYSTEM 1

lectures 2 hours	exercises for 2 hours
• Principles of heart failure treatment Clinical problems: • Cardiac decompensation	• Cardiotonic glycosides poisoning

UNIT 12 (TWELVTH WEEK):

CARDIOVASCULAR SYSTEM 2

lectures 2 hours	exercises for 2 hours
• Principles of edema treatment Clinical problems: • Migraine • Cardiac arrest	• Uterotonics and tocolytics

UNIT 13 (THIRTEENTH WEEK):

CARDIOVASCULAR SYSTEM 3

lectures 2 hours	exercises for 2 hours
• Principles of treatment of arterial hypertension • Principles of treatment of coronary disease • Principles of treatment of cardiac arrhythmias Clinical problems: • Arterial hypertension	• Evidence-based medicine: an analysis of the validity and practical significance of clinical studies

UNIT 14 (FOURTEENTH WEEK):

CARDIOVASCULAR SYSTEM 4

lectures 2 hours	exercises for 2 hours
• Treatment of disorders of peripheral circulation • Treatment of hyperlipoproteinemia and atherosclerosis Clinical problems: • Angina pectoris	• Design of clinical trials with drugs and principles of Good Clinical Practice

UNIT 15 (FIFTHEENTH WEEK):

CARDIOVASCULAR SYSTEM 5

lectures 2 hours	exercises for 2 hours
• Pharmacology of water and electrolytes Clinical problems: • Cardiac arrhythmia • Intermittent claudication • Hyperlipidemia	• Effect of drugs on coronary blood flow and the isolated heart

UNIT 16 (SIXTEENTH WEEK):

RESPIRATORY TRACT

lectures 2 hours	exercises for 2 hours
• Principles of treatment of chronic obstructive pulmonary disease Clinical problems: • Bronchial asthma	• Distribution and origin of medicines; pharmacopoeia

UNIT 17 (SEVENTEENTH WEEK):

BLOOD AND TISSUES

lectures 2 hours	exercises for 2 hours
• Anticoagulants, antiplatelet drugs and coagulant agents Clinical problems: • Anemia • Burns	• Prescribing medicines; prescription • Powders

UNIT 18 (EIGHTEENTH WEEK):

GASTROINTESTINAL TRACT

lectures 2 hours	exercises for 2 hours
• Principles of treatment of peptic ulcer • Pharmacotherapy of vomiting Clinical problems: • Treatment of constipation and diarrhea • Implantation of hip endoprosthesis	• Tablets

UNIT 19 (NINETEENTH WEEK):

ENDOCRINE SYSTEM 1

lectures 2 hours	exercises for 2 hours
• Pharmacology of the thyroid gland • Pharmacology of the endocrine pancreas Clinical problems: • Osteoporosis • Hyperglycemic coma	• Capsules and suppositories

UNIT 20 (TWENTIETH WEEK):

ENDOCRINE SYSTEM 2

lectures 2 hours	exercises for 2 hours
• Pharmacology of adrenal cortex • Pharmacology of sterility and contraception Clinical problems: • Gynecological bleeding • Childbirth and puerperium	• Oral examination of the material from the previous 10 weeks

THIRD MODULE: ANTIMICROBIAL DRUGS, CYTOSTATICS, IMMUNOSUPPRESSANTS AND TOXICOLOGY

UNIT 21 (TWENTY-FIRST WEEK):

ANTIBIOTICS

lectures 2 hours	exercises for 2 hours
• General principles of anti-infective therapy • Antibiotics Clinical problems: • Bronchopneumonia and pyelonephritis • Sepsis • Osteomyelitis	• Solutions, mixtures, suspensions, syrups, enemas

UNIT 22 (TWENTY-SECOND WEEK):

ANTIFUNGAL DRUGS

lectures 2 hours	exercises for 2 hours
• Antifungal drugs Clinical problems: • Fungal meningitis	• Drops

UNIT 23 (TWENTY-THIRD WEEK):

ANTIVIRUS DRUGS

lectures 2 hours	exercises for 2 hours
• Antiviral drugs Clinical problems: • Acquired immunodeficiency syndrome	• Teas, macerates , infusions , decoctions , emulsions

UNIT 24 (TWENTY-FOURTH WEEK):

ANTI-PARASITIC DRUGS

lectures 2 hours	exercises for 2 hours
• Antiparasitic drugs Clinical problems: • Amebiasis • Ectoparasites • Candidiasis	• Injections, infusion solutions, inhalations

UNIT 25 (TWENTY-FIFTH WEEK):

CYTOSTATICS

lectures 2 hours	exercises for 2 hours
• Principles of treatment of malignant diseases Clinical problems • Leukemia	• Ointments, pastes, gels, creams, wound dressings, vaccines and serums

UNIT 26 (TWENTY-SIXTH WEEK):

IMMUNOSUPPRESSANTS

lectures 2 hours	exercises for 2 hours
• Immunopharmacology Clinical problems • Kidney transplantation	• Bronchodilation

UNIT 27 (TWENTY-SEVENTH WEEK):

TOXICOLOGY 1

lectures 2 hours	exercises for 2 hours
• General principles of poisoning treatment Clinical problems: • Coma in poisoned	• Methods of measuring the concentration of drugs in the blood • Methods of collecting data on side effects of drugs

UNIT 28 (TWENTY-EIGHT WEEK):

TOXICOLOGY 2

lectures 2 hours	exercises for 2 hours
• Antidots Clinical problems: • Carbon monoxide poisoning	• Anatomical-Therapeutic-Chemical classification of drugs and defined daily doses

UNIT 29 (TWENTY-NINETH WEEK):

TOXICOLOGY 3

lectures 2 hours	exercises for 2 hours
Clinical problems: • Mushroom poisoning • Wilson's disease	• Individualized medication dosing

UNIT 30 (THIRTIETH WEEK):

TOXICOLOGY 4

lectures 2 hours	exercises for 2 hours
Clinical problems: • Poisoning by a corrosive agent • Pesticide poisoning	• Oral examination of the material from the previous 10 weeks

Consultations with teachers: every Friday, from 1 to 2 p.m., in the premises of the Department of Pharmacology (rooms 21 and 23)

LECTURE SCHEDULE

Hall on the 8th floor of UCCK

TUESDAY

11:15 - 12:45

SCHEDULE OF EXERCISES

WEDNESDAY	
R31	**R32**
08:30 - 10:00	**08:30 - 10:00**
group I	**group II**

LESSONS SCHEDULE FOR THE COURSE PHARMACOLOGY AND TOXICOLOGY

module	week	**type**	**unit name**	**a teacher**
1	1	**L**	General pharmacology. Pharmacodynamics.	Prof. Slobodan Janković
1		**E**	Relationship between dose and drug effect, drug interactions (antagonism and synergism).	Prof. Slobodan Janković, Assist Prof Miloš Milosavljević
1	2	**L**	Pharmacokinetics.	Prof. Slobodan Janković
1		**E**	Calculation of basic pharmacokinetic parameters.	Assoc. Prof. Dejana Ružić-Zečević, Assist Prof Miloš Milosavljević
1	3	**L**	Vegetative nervous system - parasympathicus	Prof. Nataša Đorđević
1		**E**	Effect of cholinergic and anticholinergic drugs on cat's arterial pressure	Prof. Nataša Đorđević, Prof. Slobodan Janković
1	4	**L**	Vegetative nervous system - sympathicus	Prof. Nataša Đorđević
1		**E**	Effect of adrenergic drugs on cat's arterial pressure	Prof. Nataša Đorđević, Prof. Slobodan Janković
1	5	**L**	Vegetative nervous system – clinical cases 1	Prof. Jasmina Milovanović
1		**E**	The influence of adrenergic blockers on cat's arterial pressure	Prof. Jasmina Milovanović, Prof. Nataša Đorđević
1	6	**L**	Vegetative nervous system – clinical cases 2	Prof. Jasmina Milovanović
1		**E**	Influence of myorelaxant drugs on striated musculature	Prof. Jasmina Milovanović, Prof. Nataša Đorđević

LESSONS SCHEDULE FOR THE COURSE PHARMACOLOGY AND TOXICOLOGY

module	week	type	unit name	a teacher
1	7	**L**	Central nervous system 1	Prof. Dragan Milovanovic
1		**E**	Methods of testing psychopharmaceuticals. Acute poisoning with barbiturates.	Prof. Dragan Milovanovic, Prof. Jasmina Milovanović
1	8	**L**	Central nervous system 2	Prof. Dragan Milovanovic
1		**E**	Effect of morphine on rabbit respiration	Prof. Dragan Milovanovic, Prof. Jasmina Milovanović
1	9	**L**	Central nervous system 3	Prof. Mihajlo Jakovljević
1		**E**	Working with pharmacological databases on the Internet.	Assist . Prof. Radica Zivković Zarić, Prof. Dragan Milovanovic
1	10	**L**	Central nervous system 4	Prof. Mihajlo Jakovljević
1		**E**	**Oral examination of the material from the first 10 weeks.**	Prof. Slobodan Janković, Prof. Nataša Đorđević, Assist . Prof. Radica Zivković Zarić, Assist Prof Miloš Milosavljević,
2	11	**L**	Cardiovascular system 1	Prof. Marina Kostić
2		**E**	Cardiotonic glycoside poisoning	Prof. Marina Kostić, Prof. Dragan Milovanovic
2	12	**L**	Cardiovascular system 2	Prof. Marina Kostić
2		**E**	Uterotonics and tocolytics	Prof. Marina Kostić, doc. Dr Ana Pejčić

LESSONS SCHEDULE FOR THE COURSE PHARMACOLOGY AND TOXICOLOGY

module	week	type	unit name	a teacher
2	13	**L**	Cardiovascular system 3	Assoc. Prof. Dejana Ružić-Zečević
2		**E**	Evidence-based medicine: an analysis of the validity and practical significance of clinical studies.	Assoc. Prof. Dejana Ružić-Zečević, Prof. Marina Kostić
2	14	**L**	Cardiovascular system 4	Assoc. Prof. Dejana Ružić-Zečević
2		**E**	Design of clinical trials with drugs and principles of Good Clinical Practice	Assoc. Prof. Dejana Ružić-Zečević, Prof. Marina Kostić
2	15	**L**	Cardiovascular system 5	Assist . Prof. Radica Zivković Zarić
2		**E**	Effect of drugs on coronary blood flow and isolated heart.	Assist . Prof. Radica Zivković Zarić, Assoc. Prof. Dejana Ružić-Zečević
2	16	**L**	Respiratory tract	Assist . Prof. Radica Zivković Zarić
2		**E**	Classification and origin of drugs; pharmacopoeia	Assist. Prof. Radica Zivković Zarić, Assoc. Prof. Dejana Ružić-Zečević
2	17	**L**	Blood and tissues	Assist. Prof. Ana Pejčić
2		**E**	Prescribing medicines; prescription, Powders.	Assist. Prof. Ana Pejčić, Assist . Prof. Radica Zivković Zarić

LESSONS SCHEDULE FOR THE COURSE PHARMACOLOGY AND TOXICOLOGY

module	week	**type**	**unit name**	**a teacher**
2	18	**L**	Gastrointestinal tract	Assist. Prof. Ana Pejčić,
2		**E**	Tablets	Assist. Prof. Ana Pejčić, Assist . Prof. Radica Zivković Zarić
2	19	**L**	Endocrine system 1	Prof. Jasmina Milovanović,
2		**E**	Capsules and suppositories	Prof. Jasmina Milovanović , Assist. Prof. Ana Pejčić
2	20	**L**	Endocrine system 2	Prof. Jasmina Milovanović
2		**E**	**Oral examination of the material from the previous 10 weeks.**	Prof. Jasmina Milovanović, Assist. Prof. Ana Pejčić, Prof. Marina Kostić, Assist Prof Miloš Milosavljević,
3	21	**L**	Antibiotics	Assoc. Prof. Dejana Ružić-Zečević
3		**E**	Solutions, mixtures, suspensions, syrups, enemas	Prof. Nataša Đorđević, Prof. Jasmina Milovanović
3	22	**L**	Antifungal drugs	Assoc. Prof. Dejana Ružić-Zečević
3		**E**	Drops.	Prof. Nataša Đorđević, Prof. Jasmina Milovanović
3	23	**L**	Antiviral drugs	Assist Prof Miloš Milosavljević
3		**E**	Teas, macerates, infusions, decoctions, emulsions	Assist Prof Miloš Milosavljević, Assoc. Prof. Dejana Ružić-Zečević
3	24.	**L**	Antiparasitic drugs	Assist Prof Miloš Milosavljević

LESSONS SCHEDULE FOR THE COURSE PHARMACOLOGY AND TOXICOLOGY

module	week	type	unit name	a teacher
3	24.	**E**	Injections, infusion solutions, inhalations	Ass. Prof. Miloš Milosavljević, Assoc. Prof. Dejana Ružić Zečević
3	25	**L**	Cytostatics	Prof. Mihajlo Jakovljević
3		**E**	Ointments, pastes, gels, creams, wound dressings, vaccines and serums.	Assist Prof Miloš Milosavljević, Assist. Prof. Ana Pejčić
3	26	**L**	Immunosuppressants	Prof. Mihajlo Jakovljević
3		**E**	Bronchodilation. Methods of measuring the concentration of drugs in the blood.	Assist Prof Miloš Milosavljević, Assist. Prof. Ana Pejčić
3	27	**L**	Toxicology 1	Prof. Nataša Đorđević
3		**E**	ATC classification of drugs and defined daily doses	Prof. Nataša Đorđević, Prof. Marina Kostić
3	28	**L**	Toxicology 2	Prof. Nataša Đorđević
3		**E**	Individualized medication dosing	Prof. Nataša Đorđević, Prof. Marina Kostić
3	29	**L**	Toxicology 3	Prof. Marina Kostić
3		**E**	Methods of collecting data on side effects of drugs.	Prof. Slobodan Janković Prof. Marina Kostić
3	30	**L**	Toxicology 4	Prof. Marina Kostić
3		**E**	**Oral examination of the material from the previous 10 weeks.**	Prof. Slobodan Janković Prof. Marina Kostić, Assoc. Prof. Dejana Ružić-Zečević, Prof. Nataša Đorđević
			EXAM (June term)	