

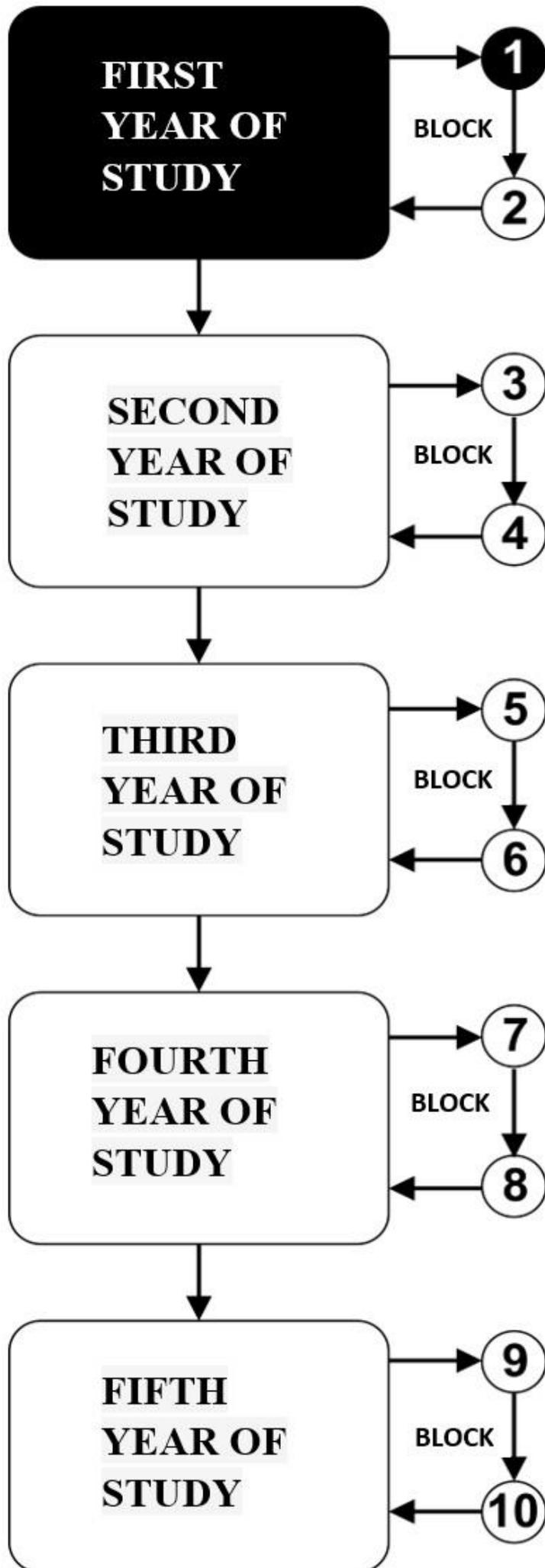


**INTEGRATED ACADEMIC
PHARMACY STUDIES**

FIRST YEAR OF STUDY

academic 2025/2026.

ORGANIC CHEMISTRY 1



Course:

ORGANIC CHEMISTRY

The course is evaluated with 7 ESPB. There are 5 hours of active teaching per week (3 hours of lectures and 2 hours of work in a small group).

TEACHERS AND ASSOCIATES:

	First and last name	Email address	Title
1.	Gordana P. Radić	vasic_gordana@yahoo.com	Full professor
2.	Snežana Jovanović Stević	snezanaj@kg.ac.rs	Assistant professor
3.	Andriana Bukonjić	andriana.bukonjic@hotmail.com	Associate Professor
4.	Dušan Tomović	dusantomovic88@yahoo.com	Associate Professor
5.	Ana Živanović	ana.zivanovic@fmn.kg.ac.rs	Assistant professor
6.	Nikola Nedeljkovic	nikola.nedeljkovic@fmn.kg.ac.rs	Assistant professor

Structure of subject:

Module	Module name	Week	Lectures	Work in a small group	Teacher-supervisor module
1	Fundamentals of organic chemistry; Hydrocarbons, alkanes and cycloalkanes; Alkenes; Alkynes and dienes, aromatic hydrocarbons; Haloalkanes, alcohols, aldehydes and ketones; Carboxylic acid and carboxylic acid derivatives, unsaturated carbonyl compounds, amines and phenols; Macromolecules, organic nitrogen compounds, amino acids, proteins, lipids and oils; Carbohydrates and nucleic acids.	8	3	2	Prof.dr Gordana Radić
2	Structures of organic compounds; Electronic effects in organic molecules, electromeric effect, hyperconjugation, aromaticity; Stereochemistry, stereochemistry of acyclic, unsaturated and cyclic compounds; Acidity and basicity of organic compounds; Division and nomenclature of heterocyclic compounds, five-member heterocycles with one heteroatom; Six-member heterocycles with one heteroatom, benzopyridines; Five-member and six-member heterocycles with two heteroatoms.	7	3	2	Prof.dr Gordana Radić
					Σ 45+30=75

SCORING:

The student overcomes the course based on the points achieved in the pre-examination activities and the final test. The score is equivalent to the number of gained points (see tables). Points are earned as follows:

ACTIVITY DURING CLASSES: The student can gain up to 15 points by taking 1 exam question from that week, answering and receiving 0-1 points in accordance with the demonstrated knowledge.

FINAL TESTS BY MODULES: The student can gain up to 55 points according to the attached table.

FINAL EXAM:

Final exam: 30 points

Modul		Maximum points		
		activity during classes	final exam	Σ
1	Fundamentals of organic chemistry; Hydrocarbons, alkanes and cycloalkanes; Alkenes; Alkynes and dienes, aromatic hydrocarbons; Haloalkanes, alcohols, aldehydes and ketones; Carboxylic acid and carboxylic acid derivatives, unsaturated carbonyl compounds, amines and phenols; Macromolecules, organic nitrogen compounds, amino acids, proteins, lipids and oils; Carbohydrates and nucleic acids.	8	30	38
2	Structures of organic compounds; Electronic effects in organic molecules, electromeric effect, hyperconjugation, aromaticity; Stereochemistry, stereochemistry of acyclic, unsaturated and cyclic compounds; Acidity and basicity of organic compounds ; Division and nomenclature of heterocyclic compounds, five-member heterocycles with one heteroatom; Six-member heterocycles with one heteroatom, benzopyridines; Five-member and six-member heterocycles with two heteroatoms.	7	25	32
	Final exam			30
	Σ			100

In order to pass the course, student must gain a minimum of 51 points and pass all the modules.

To pass the module the student must:

1. Gain more than 50% of the points in that module
2. Gains more than 50% of the points provided for teaching activity in each module
3. Pass the module test, ie to have more than 50% correct answers.

NUMBER OF POINTS GAIN	MARK
0 - 50	5
51 - 60	6
61 - 70	7
71 - 80	8
81 - 90	9
91 - 100	10

TESTS BY MODULES

MODULE 1.

FINAL MODULE TEST
0-30 POINTS

EVALUATION OF FINAL MODULE TEST

The test has 15 questions
Each question is worth 1 or 2 points

MODULE 2.

FINAL MODULE TEST
0-25 POINTS

EVALUATION OF FINAL MODULE TEST

The test has 15 questions
Each question is worth 1 or 2 points

FINALE TEST

FINALE TEST
0-30 POINTS

EVALUATION OF FINAL TEST

The test has 15 questions
Each question is worth 2 points

LITERATURE:

Modul	BOOK NAME	AUTHORS	PUBLISHER	LIBRARY
Fundamentals of organic chemistry; Hydrocarbons, alkanes and cycloalkanes; Alkenes; Alkynes and dienes, aromatic hydrocarbons; Haloalkanes, alcohols, aldehydes and ketones; Carboxylic acid and carboxylic acid derivatives, unsaturated carbonyl compounds, amines and phenols; Macromolecules, organic nitrogen compounds, amino acids, proteins, lipids and oils; Carbohydrates and nucleic acids.	Organic Chemistry Structure and Function	P. C. Vollhardt, N. E. Schore	W.H. Freeman & Co. Ltd, New York, 2014.	/
Structures of organic compounds; Electronic effects in organic molecules, electromeric effect, hyperconjugation, aromaticity; Stereochemistry, stereochemistry of acyclic, unsaturated and cyclic compounds; Acidity and basicity of organic compounds ; Division and nomenclature of heterocyclic compounds, five-member heterocycles with one heteroatom; Six-member heterocycles with one heteroatom, benzopyridines; Five-member and six-member heterocycles with two heteroatoms.	Organic Chemistry Structure and Function	P. C. Vollhardt, N. E. Schore	W.H. Freeman & Co. Ltd, New York, 2014.	/

All the lectures and materials for small groups work could be found on the website of Faculty of Medical Sciences: www.medf.kg.ac.rs

Program

TEACHING UNIT 1 (FIRST WEEK):

FUNDAMENTALS OF ORGANIC CHEMISTRY

lectures 3 hours	work in a small group for 2 hours
Fundamentals of organic chemistry; Organic chemistry's significance for pharmaceutical chemistry; Structure of atom; Bonding in organic compounds;	Laboratory glassware and equipment; Distillation of organic compounds; Purification and drying of the solvent; Qualitatively detection of different organic compounds;

TEACHING UNIT 2 (SECOND WEEK):

HYDROCARBONS. ALKANES AND CYCLOALKANES

lectures 3 hours	work in a small group for 2 hours
Hydrocarbons; Alkanes and cycloalkanes: Structures and reactions; Stereochemistry	Nomenclature of alkanes; mechanism of free-radical reaction substitution of alkane; cycloalkane conformation

TEACHING UNIT 3 (THIRD WEEK):

ALKENES

lectures 3 hours	work in a small group for 2 hours
Alkenes: Structures, properties and reactions	Nomenclature of alkenes and mechanism of their reactions

TEACHING UNIT 4 (FOURTH WEEK):

ALKYNES AND DIENES.

lectures 3 hours	work in a small group for 2 hours
Nomenclature, physical and chemical properties and production of alkynes; division of dienes; mechanism of addition;	Synthesis and characterization of acetylene; Reaction of addition

TEACHING UNIT 5 (FIFTH WEEK):

AROMATIC HYDROCARBONS

lectures 3 hours	work in a small group for 2 hours
arenes and aromaticity, electrophilic aromatic substitution	Mechanism of reaction electrophilic aromatic substitution;

TEACHING UNIT 6 (SIXTH WEEK):

HALOALKANES

lectures 3 hours	work in a small group for 2 hours
Alkyl- and aryl- halides; Introduction to nucleophilic substitution and elimination reactions;	Preparation of organic Alkyl- and aryl- halides; Differences between mechanisms S_N1 и S_N2 reaction of nucleophilic substitution; Differences between mechanisms $E1$, $E2$ и $E1_{cb}$ elimination reactions;

TEACHING UNIT 7 (SEVENTH WEEK):

ALCOHOLS, ETHERS, EPOXIDES

lectures 3 hours	work in a small group for 2 hours
Alcohols and ethers; Epoxides;	Preparation of Alcohols, chemical properties of alcohols; Synthesis of aromatic ethers;

TEACHING UNIT 8 (EIGHTH WEEK):

ALDEHYDES AND KETONES

lectures 3 hours	work in a small group for 2 hours
Aldehydes and ketones;	Evidence reactions for aldehydes and ketones

TEACHING UNIT 9 (NINTH WEEK):

CARBOXYLIC ACIDS AND CARBOXYLIC ACID DERIVATIVES.

lectures 3 hours	work in a small group for 2 hours
Carboxylic acids and derivatives;	Preparation of carboxylic acids;

TEACHING UNIT 10 (TENTH WEEK):

REACTION INVOLVING CARBANIONS

lectures 3 hours	work in a small group for 2 hours
Carbanions Aldol condensation Claisen condensation Syntheses using malonic ester and acetoacetic ester	Application of carbanions in organic synthesis Condensation reactions

TEACHING UNIT 11 (ELEVENTH WEEK):

AMINES AND PHENOLS.

Lectures 3 hours	work in a small group for 2 hours
Amines and phenols, α,β -unsaturated carbonyl compounds	Reactions of amines and phenols

TEACHING UNIT 12 (TWELFTH WEEK):

UNSATURATED CARBONYL COMPOUNDS.

lectures 3 hours	work in a small group for 2 hours
Addition to conjugated double bonds α,β -unsaturated carbonyl compounds	α,β -unsaturated carbonyl compounds

TEACHING UNIT 13 (THIRTEENTH WEEK):

Five-member and six-member heterocycles with two heteroatoms.

lectures 3 hours	work in a small group for 2 hours
Five-member and six-member heterocycles with two heteroatoms.	Five-member and six-member heterocycles with two heteroatoms.

TEACHING UNIT 14 (FOURTEENTH WEEK):

MACROMOLECULES. ORGANIC NITROGEN COMPOUNDS, AMINO ACIDS, PROTEINS, LIPIDS AND OILS

lectures 3 hours	work in a small group for 2 hours
Division, reactions and obtained of organic nitrogen compounds, amino acids; proteins; lipides and oils	Mechanism of electrophilic aromatic substitution reactions

TEACHING UNIT 15 (FIFTEENTH WEEK):

CARBOHYDRATES AND NUCLEIC ACIDS

lectures 3 hours	work in a small group for 2 hours
Representatives and chemical properties of monosaccharides; disaccharides; polysaccharides; types of nucleic acids; their structure and biological significance	Nomenclature of carbohydrates; Determination of the primary, secondary and tertiary structure of nucleic acids

LECTURE SCHEDULE

WEDNESDAY

**PHARMACY PRACTICE ROOM 17
(R17)**

15.05-17.20

EXERCISE SCHEDULE

THURSDAY

PHARMACY PRACTICE ROOM 18 (R18)

8.00-09.30

[Schedule of lectures, practical classes and tests – academic calendar](#)

LESSON SCHEDULE FOR THE SUBJECT ORGANIC CHEMISTRY

modul	week	date	time	place	type	the name of the method unit	teacher	
1	1				L	Fundamentals of organic chemistry.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković	
					E	Fundamentals of organic chemistry.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković	
	2				L	Hydrocarbons, alkanes and cycloalkanes.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković	
					E	Hydrocarbons, alkanes and cycloalkanes.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković	
	3					L	Alkenes.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
						E	Alkenes.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković

LESSON SCHEDULE FOR THE SUBJECT ORGANIC CHEMISTRY

modul	week	date	time	place	type	the name of the method unit	teacher
	4				L	Alkynes and dienes.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Alkynes and dienes.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
	5				L	Aromatic hydrocarbons.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Aromatic hydrocarbons.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
	6				L	Haloalkanes	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Haloalkanes	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković

LESSON SCHEDULE FOR THE SUBJECT ORGANIC CHEMISTRY

modul	week	date	time	place	type	the name of the method unit	teacher
1	7				L	Alcohols, ethers, epoxides	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Alcohols, ethers, epoxides	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
	8				L	Aldehydes and ketones	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Aldehydes and ketones	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
						Final test of the first module	
2	9				L	Carboxylic acid and carboxylic acid derivatives	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Carboxylic acid and carboxylic acid derivatives	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović

LESSON SCHEDULE FOR THE SUBJECT ORGANIC CHEMISTRY

modul	week	date	time	place	type	the name of the method unit	teacher
							Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
	10				L	Reaction involving carbanions	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Reaction involving carbanions	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
	11				L	Amines and phenols.	Prof. Dr Gordana Radić
						E	Amines and phenols.
	12				L	Unsaturated carbonyl compounds.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
						E	Unsaturated carbonyl compounds.
2	13				L	Five-member and six-member heterocycles with two heteroatoms.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković

LESSON SCHEDULE FOR THE SUBJECT ORGANIC CHEMISTRY

modul	week	date	time	place	type	the name of the method unit	teacher
					E	Five-member and six-member heterocycles with two heteroatoms.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
	14				L	Macromolecules. Organic nitrogen compounds, amino acids, proteins, lipids and oils.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
					E	Macromolecules. Organic nitrogen compounds, amino acids, proteins, lipids and oils.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
	15				L	Carbohydrates and nucleis acids.	Prof. Dr Gordana Radić Assist. Professor Snežana Jovanović Stević Assist. Professor Andriana Bukonjić Assist. Professor Dušan Tomović Assist. Professor Ana Živanović Assist. Professor Nikola Nedeljković
						E	Carbohydrates and nucleis acids.
						Final test of the second module	
						FINALE EXAM	
						EXAM	

