

STANDARD 1: STUDY PROGRAMME STRUCTURE

Integrated undergraduate and master academic studies of Pharmacy last 5 years (10 semesters) with the total of 4050 active classes, granting 300 ECTS points upon their completion. The study programme contains both mandatory and elective courses, the final work (10 ECTS points) and the students' professional practice (10 ECTS points). A student who completes these integrated academic studies acquires the academic title of the Master of Pharmacy.

Each course in the study programme has its number of ECTS points related to the set of tasks that students need to perform in order to accomplish the studying goals and outcomes. The total of ECTS points in each academic year is 60. Upon passing the final exam, the student scores the appropriate number of ECTS points for the specific course. The study programme offers that, in addition to the mandatory courses, the student has the option of choosing from a list of elective courses (elective courses represent 18 % of the total number of ECTS points) allowing acquisition of the knowledge from the fields of personal interest and skills relevant to the performance on the future job positions.

The study programme structure enables students to gain comprehensive knowledge on: drugs (active pharmaceutical ingredients and excipients, quality control of substances and dosage forms, pharmaceutical dosage forms, manufacturing and compounding of various dosage forms), patients (human body, disease, pharmacotherapy, pharmaceutical care), and the healthcare system (pharmaceuticals business systems, healthcare systems, national drug policy, regulation and legislation). The concept of the study programme is such that in the first semester students generally acquire knowledge in basic sciences that are relevant to the study of Pharmacy (Mathematics, Physics, Biology, Chemistry) and basic medical sciences (Anatomy and Histology, Physiology, Immunology, Microbiology). At the senior years of the studies, the study programme is oriented towards pharmaceutical professional and professional-applicative courses (Pharmaceutical Chemistry, Pharmacognosy, Bromatology, Pharmaceutical Technology, etc.) and courses of the medical sciences that are closely related to the Pharmacy (Pathophysiology, Pharmacology, Pharmacotherapy, Medical Biochemistry) as well as from the area of social pharmacy (Pharmaceutical law and ethics, Introduction to the pharmaceutical management system, etc.). Tenth semester is dedicated to the preparation of the final work as well as to the attendance of the professional practice necessary for the future professional work of the student.

Proposed learning methods include interactive lectures, laboratory (experimental) exercises that are carried out individually by students in chemical, instrumental, biochemical, microbiological, toxicological and other laboratories; workshops organized for theoretical exercises, seminars, and in some instances field work. Selected teaching methods are adapted to the number of students, and all incorporate usage of computers.

Considerable attention is dedicated to the experimental work of students. Student's research abilities are trained during the preparation of the final work, or earlier during the studies if the student voluntarily takes part in the students' scientific research projects. These students have the option of being directed towards independent research work, through individual work with a mentor, and inclusion in scientific research programs.

TABLES AND SUPPLEMENTS

- Supplement 1.1: Faculty of Pharmacy website
- Supplement 1.1a: Publication of the Faculty: Prospective students informer

STANDARD 2: PURPOSE OF STUDY PROGRAMME

Purpose of the study program Pharmacy is to educate masters of pharmacy in accordance with the general social and national interests of Republic of Serbia, as well as with the principles of European high education contained in the Bologna Declaration, attitudes and recommendations of international expert and academic associations in the field of pharmacy. Besides this, the study program promotes principles generally accepted by academic communities in developed countries, it also enables students to reach professional education that is necessary for independent work on tasks in the system of healthcare (public and hospital pharmacies), in pharmaceutical industry, medicine and medicine product manufacturing, in marketing and medicine selling, regulatory bodies, pharmacovigilance and clinical research, in other professional tasks and in scientific research.

Hence the purpose of this study program is to enable student to reach knowledge, skills and attitude which will allow him to perform his tasks in professional and ethical manner. Also, the purpose of the study program is to acquaint students with principles of experimental and research work, with skills of literature research and analyzing modern research problems. By mastering courses contents, student acquires knowledge and skills of ethical analysis and critical thinking while making decisions and solving problems concerning pharmaceutical and biomedical research, toxicological, ecological and other pharmaceutical activities.

TABLES AND SUPPLEMENTS

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STANDARD 3: GOALS OF THE STUDY PROGRAMME

General goals

The primary goal of the study programme of Pharmacy is to educate an expert with the high level of competencies and ethical norms required for working in the healthcare system (in institutions of primary, secondary and tertiary level; various offices and institutes), industry (pharmaceutical manufacturing, distribution and marketing of the drug products), regulatory bodies and other businesses, as well as to conduct the scientific research. In order to achieve this goal, student needs to acquire the fundamental knowledge first, followed by the applied practices in various fields of pharmacy that are tailored to train the student for the work in the pharmacy (community or hospital pharmacy), pharmaceutical industry; clinical, toxicological, and various control laboratories; regulatory bodies, marketing and sales of the drug products and other job positions.

Specific goals

Specific goals of the study programme enable the student to acquire competencies and skills related to: notion of the physico-chemical structure of drugs and relationships between the structure and biological activity of a drug, application of various analytical methods and techniques, handling of the equipment and instruments, laboratory work, qualitative and quantitative analyses in the field of pharmacy, safe handling of the chemical and pharmaceutical materials, prediction of risks related to the pharmaceutical procedures and practices, pharmaceutical compounding, monitoring and improvement of the manufacturing processes, assessment and interpretation of the laboratory analysis data, recognition of basic symptoms and signs of diseases; recognition of interactions, adverse and toxicological effects of drugs; verbal and written communication with patients, doctors, other healthcare providers and the general public; generation and critical evaluation of information and data; self-study and planning of their own career improvement; usage of the professional references and information systems; independent and team work; planning, design and conducting of the research projects; identification, solution of problems and decision making.

Acquired title of the Master of Pharmacy will be recognized by the European institutions, allowing the students to continue their professional or scientific development (through doctoral studies), with no need for differential exams upon admission, in the field of pharmacy or other related disciplines at national or European universities.

In accordance to these goals, a contemporary curriculum of the study programme of Pharmacy has been developed, accompanied by the appropriate teaching methods and knowledge assessments implemented by the qualified and competent teaching staff.

TABLES AND SUPPLEMENTS

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STANDARD 4: COMPETENCIES OF GRADUATED STUDENTS

Description of general and course specific competencies of students (200 words top)

Upon graduation from study program Pharmacy, candidate is qualified to perform tasks that, by systematization, require degree of the Faculty of Pharmacy. In the domain of healthcare competencies of the pharmacist, implicate all activities that are necessary for preservation and protection of population health, health promotion by advising patients and other persons about the safe and efficient medicine use. As a medicine expert, pharmacist perform tasks related to all aspects of medicine synthesis, medicine formulations, manufacturing, medicine control, distribution and rational administration of medicines, herbal supplements, dietetic supplements and other products which are used in order to promote public health. Pharmacist is capable to understand national, European and international legislation and to apply them in everyday work. Acquired degree enables continuing education: admission to specialized and doctoral academic studies in the medical sciences field (pharmaceutical and medical sciences), natural sciences and mathematics under the condition that average rating during the study is at least 8 (eight). Candidates also may admit to specialized studies for healthcare needs and according to the needs of institutions which they are employed in and according to approval of Ministry of Health.

Description of learning outcomes (top 200 words)

Students who successfully complete this program of study are capable to:

1. work independently in the pharmacy on tasks related to supplying, production and dispensing of medicines, medical product and dietetic supplement, providing information about their proper and safe use;
2. represent a part of the healthcare expert team, together with physician and other healthcare employers provides implementation of rational pharmacotherapy as well as other activities related to prevention and treatment of disease and promotion of healthy way of life;
3. perform tasks related to development, manufacturing, quality control and registration of medicines, medical products, dietetic and cosmetic products;
4. perform tasks related to provision of access, distribution and marketing of medicines, medical products, dietetic and cosmetic products;
5. participate in the work of regulatory bodies concerning adoption and implementation of legislation and in research pharmaceutical practice in order to ensure functioning and permanent promotion of healthcare system and public health;
6. work on development and implementation of corresponding analytical methods and techniques in research, development laboratories and centers in various fields of pharmaceutical and biomedical sciences;
7. participate in conducting educational process and in continuous professional perfecting and lifelong learning.

TABLES AND SUPPLEMENTS

- Supplement 4.1: Diploma supplement

STANDARD 5: CURRICULUM

The study programme Pharmacy represents integrated academic studies that last 5 years (10 semesters), granting 300 ECTS points upon their completion, and consisting of the 59 courses: 45 mandatory and 14 elective courses that students get to choose 14 from. The total number of active classes is 4050, 2250 of which are lectures and 1800 classes are held as exercises. In the each year of the studies a condition is fulfilled that lectures classes represent more than 50 % of the active classes, as well as that the total number of active classes in each year of the studies is 600-900. The classes required for the preparation of the final work and the students professional practice do not count as the active classes.

Students' professional practice is scheduled for the tenth semester, consisting of 300 classes (which do not count as the active classes), granting 10 ECTS points and taking place in one of the teaching bases of the Faculty of Pharmacy. Students' professional practice is defined in the curriculum of the pharmacist by the European DIRECTIVE 2005/36/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL. Furthermore, preparation of the final work, granting 10 ECTS points, takes place in the tenth semester as well. All courses have been divided in the following groups: general academic courses (representing 15,5 %), theoretical and methodological courses (representing 20,5 %), scientific and professional (representing 37 %) and professionally applicable (representing 27 %), which is in accordance with the standards. Elective courses represent 18 % in the total sum of ECTS points. At each block of elective courses there are at least two courses that student gets to choose from. The most of the elective courses (17 of them) are professionally applicable.

The structure of the curriculum consist of the general academic courses, courses in the field of chemistry, courses in the field of medical sciences, biological sciences, pharmaceutical technology and the social pharmacy. The fraction of selected courses is such that it enables the outcomes of the study programme of Pharmacy, which is in accordance to the European curricula of faculties of Pharmacy, documented in Standard 6, Supplement 6.4.c.

TABLES AND SUPPLEMENTS

- Table 5.1: Semesters and year of studies timetables
- Table 5.2: Courses specifications
- Table 5.3: The study programme: list of the elective courses
- Table 5.4: List of courses according to the group of courses
- Supplement 5.1: Timetable
- Supplement 5.2: The book of courses (printed or electronic form at the institution website)

Semesters and year of studies timetables

Number	Course code	Course title	Semester	Lectures	Exercises	Practice	ECTS points
THE FIRST YEAR							
1.	F107	Introduction to Pharmacy	I	15	0		1
2.	F101	Biology with Human Genetics	I	45	30		5
3.	F102	Functional Human Morphology	I	45	30		5
4.	F103	General and Inorganic Chemistry	I	60	30		5
5.	F106	Organic Chemistry 1	I	60	0		5
6.	F104	Physics	I	30	15		3
7.		Elective block 1 (1/2)	I	0	30		2
8.	F105	Mathematics	I	30	30		4
The total in the first semester				285	165		30
9.	F1010	Organic Chemistry 2	II	60	45		7
10.	F1011	Physical Chemistry	II	45	15		5
11.	F108	Physiology 1	II	45	30		5
12.	F1012	Botany	II	45	45		6
13.	F109	Analytical Chemistry 1	II	30	30		4
14.		Elective block 2 (1/2)	II	30	0		3
The total in the second semester				255	165		30
The total in the first year				540	330		60
THE SECOND YEAR							
15.	F201	Physiology 2	III	45	15		5
16.	F204	Immunology	III	30	30		5
17.	F203	Instrumental Methods	III	45	45		6
18.	F206	Pharmaceutical Chemistry 1	III	45	30		5
19.	F202	Analytical Chemistry 2	III	45	45		5
20.	F205	General Biochemistry	III	45	15		6
The total in the third semester				255	180		32
21.	F207	Pharmacology 1	IV	30	15		4
22.	F2010	Pharmaceutical Chemistry 2	IV	45	60		8
23.	F208	Pathophysiology 1	IV	30	30		5
24.	F209	Microbiology	IV	60	30		6
25.		Elective block 3 (1/3)	IV	30	15		3
26.		Elective block 4 (1/3)	IV	15	15		2
The total in the fourth semester				210	165		28
The total in the second year				465	345		60
THE THIRD YEAR							
27.	F301	Pharmacology 2	V	45	30		6
28.	F302	Pathophysiology 2	V	30	30		5
29.	F303	Bromatology	V	45	30		4
30.	F305	Pharmaceutical Chemistry 3	V	60	60		8
31.	F306	Statistics in Pharmacy	V	30	15		3
32.	F307	Pharmacognosy	V	30	30		4
The total in the fifth semester				240	195		30
33.	F308	Pharmacology 3	VI	45	15		5
34.	F304	Medical Biochemistry	VI	60	45		7
35.	F309	Pharmaceutical Technology 1	VI	45	105		9
	F307	Pharmacognosy	VI	45	30		5

36.		Elective block 5 (1/2)	VI	0	30		2
37.		Elective block 6 (1/4)	VI	15	15		2
The total in the sixth semester				210	240		30
The total in the third year				450	435		60
THE FOURTH YEAR							
38.	F403	Pharmacotherapy	VII	30	30		5
39.	F401	Pharmacokinetics	VII	45	45		6
40.	F404	Pharmaceutical Technology 2	VII	45	45		5
41.	F402	Toxicology with Analytics	VII	60	45		7
42.	F405	Phytotherapy	VII	30	30		4
43.		Elective block 7 (1/3)	VII	30	15		4
The total in the seventh semester				240	210		31
	F403	Pharmacotherapy	VIII	15	30		4
44.	F407	Dietetics	VIII	30	30		4
45.	F406	Pharmaceutical Technology 3	VIII	45	60		6
46.	F408	Pharmaceutical Legislation and Ethics	VIII	30	15		3
47.		Elective block 8 (3/6)	VIII	90	45		3x4
48.				(3x30)	(3x15)		=12
49.							
The total in the eighth semester				210	180		29
The total in the fourth year				450	390		60
THE FIFTH YEAR							
50.	F501	Clinical Pharmacy	IX	45	60		6
51.	F502	Industrial Pharmacy	IX	45	45		5
52.	F503	Pharmaceutical Analysis	IX	60	60		6
53.	F504	Cosmetology	IX	30	30		4
54.	F505	Introduction to Pharmaceutical Management	IX	15	15		2
55.		Elective block 9 (1/3)	IX	30	15		3
The total in the ninth semester				225	225		26
56.	F506	Pharmaceutical Practice	X	30	30		3
57.		Elective block 10 (2/4)	X	60	30		2x4
58.				(2x30)	(2x15)		=8
59.		Elective block 11 (1/2)	X	30	15		3
	FSP	Students professional practice	X			300	10
	FZR	Final Work	X				10
The total in the tenth semester				120	75	300	34
The total in the fifth year				345	300	300	60

The list of the elective courses

Number	Course code	Course title	Semester	Lectures	Exercises	ECTS points
Elective block 1 (1/2)						
1.	F1I2	Organic Chemistry Practicum	I	0	30	2
2.	F1I1	Introduction to Laboratory Experiments	I	0	30	2
Elective block 2 (1/2)						
3.	F1I3	Foreign Language of Pharmaceutical Profession	II	30	0	3
4.	F1I4	Application of Information Technology in Pharmacy	II	30	0	3
Elective block 3 (1/3)						
5.	F2I4	Selected Chapters of Analytical Chemistry	IV	15	15	2
6.	F2I5	Selected Chapters of General Biochemistry	IV	15	15	2
7.	F2I6	Chemistry of Solutions	IV	15	15	2
Elective block 4 (1/3)						
8.	F2I3	Introduction to Molecular Genetics	IV	30	15	3
9.	F2I2	Colloidal Chemistry	IV	30	15	3
10.	F2I1	Selected Chapters of Physiology	IV	30	15	3
Elective block 5 (1/2)						
11.	F3I1	Bromatology Practicum	VI	0	30	2
12.	F3I2	Pharmacognosy Practicum	VI	0	30	2
Elective block 6 (1/4)						
13.	F3I3	Selected Chapters of Microbiology	VI	15	15	2
14.	F3I4	Medical Terminology	VI	15	15	2
15.	F3I5	Medical plants and environment	VI	15	15	2
16.	F3I6	Foreign Language of Academic and Professional Communication	VI	15	15	2
Elective block 7 (1/3)						
17.	F4I1	Selected Chapters of Pharmaceutical Chemistry	VII	30	15	4
18.	F4I2	Laboratory Diagnostics of Metabolism Disorders	VII	30	15	4
19.	F4I3	Substances of Abuse with Analytics	VII	30	15	4
Elective block 8 (3/6)						
20.	F4I5	Selected Chapters of Pharmacokinetics	VIII	30	15	4
21.	F4I6	Veterinary Dosage Forms	VIII	30	15	4
22.	F4I7	Design and Synthesis of Drugs	VIII	30	15	4
23.	F4I8	Human Health Risk Assessment	VIII	30	15	4
24.	F4I4	Ecotoxicology	VIII	30	15	4
25.	F4I9	Sports Pharmacy	VIII	30	15	4
Elective block 9 (1/3)						
26.	F5I1	Pharmaceutical Marketing	IX	30	15	3
27.	F5I2	Medicines Supply Management	IX	30	15	3
28.	F5I3	Pharmacoeconomics and Pharmacoepidemiology	IX	30	15	3
Elective block 10 (2/4)						
29.	F5I4	Introduction to Pharmaceutical Biotechnology	X	30	15	4

30.	F5I5	Acute Drug Poisoning with Analytics	X	30	15	4
31.	F5I6	Pharmaceutical Regulations in Drug Control	X	30	15	4
32.	F5I7	Novel Dosage Forms	X	30	15	4
Elective block 11 (1/2)						
33.	F5I8	Medical Devices	X	30	15	3
34.	F5I9	Experimental Design in Pharmacy	X	30	15	3