

## STANDARD 1: STUDY PROGRAMME STRUCTURE

Subject: *Development of a pharmaceutical care plan; Interpretation of laboratory parameters; Medicine information resources* (quantified by 3 ESPB). Topics include the pharmaceutical care concept, development of a pharmaceutical care plan, interpretation of laboratory tests and medicine information resources. Teaching is conducted through lectures and problem/team based learning (P/TBL) (15 hours each).

The course introduces the principles of *Pharmaceutical care in the treatment of central nervous system diseases; Pharmaceutical care in the treatment of cardiovascular diseases; Pharmaceutical care in the treatment of respiratory, infectious and skin diseases*; Classes are carried out through lectures, P/TBL, other teaching methods (15 hours each) and 45 hours of student research assignments. Each subject is quantified by 9 ESPB. *Pharmaceutical care in the treatment of endocrine diseases and Pharmaceutical care in the treatment of diseases of the gastrointestinal and musculoskeletal systems* are equivalent to 6 ESPB and classes are taught through lectures, P/TBL, other teaching methods and student research assignments (15 hours each). Content provides fundamentals of interpreting laboratory test results for students, pharmacotherapy, pharmacokinetics, adherence, interactions and adverse effects of drugs, the role of pharmacists in improving the outcome of treatment and patients counseling.

*Pharmaceutical care in pediatric patients, pregnancy, nursing mothers, geriatric patients and in patients with impaired renal and/or liver function* are quantified by 9 ESPB. Classes are held in the form of lectures, P/TBL and other forms of teaching (15 hours each) and student research assignments (45 hours). Topics include pharmaceutical care in specific patient populations and the role of pharmacists in improving the outcome of treatment for the patient population. Students learn about the pharmacokinetic parameters that influence dosing regimen, other factors that influence the regimen, ways of dose adjustment and therapeutic drug monitoring.

The subject *Communication skills, adherence, interactions and adverse drug reactions; Pharmaceutical care research*, aims to equip students with knowledge about the consequences of the low level of adherence, models for assessing the degree of adherence and improving adherence. Students will develop fundamental skills for communication with patients and members of the health care team and acquire knowledge in drug interactions, evaluation of the clinical significance of the interaction; interaction classification, the methods and the importance of monitoring of adverse drug reactions (pharmacovigilance) and the role of pharmacists in improving the degree of adherence and prevention of adverse outcomes. This course is quantified by 9 ESPB. Teaching is conducted through lectures, P/TBLs, other teaching methods (per 15 hours) and 45 hours of students research assignment.

*Pharmacoepidemiology and pharmacoconomics*, the critical appraisal of clinical studies, evaluation of the quality of pharmaceutical care, is quantified by 6 ESPB. Teaching is conducted through lectures, P/TBLs, other teaching methods and students research assignments (per 15 hours). Contents include the definition and application of pharmacoepidemiology and pharmacoconomics, the types of pharmaco-economic studies; design and evaluation of the quality of clinical trials; conducting audits to assess the quality of a pharmaceutical care.

Presentation of case studies is quantified by 6 ESPB. Teaching is conducted through lectures, P/TBLs, other teaching methods and students research assignments (15 hours each). The course includes presenting of clinical patient cases.

Students choose an elective course between *Implementation of Pharmaceutical care in primary care; Self-medication, Phytotherapy, Dietetics; Public health;* and *Implementation of Pharmaceutical care in secondary health care; Pharmaceutical care in oncology, Supportive and palliative therapy; Drug List*. The elective course is quantified by 18 ESPB. Teaching is conducted through lectures and P/TBL (per 45 hours), other teaching methods (15 hours) and student research assignments (75 hours). Throughout the course, students are introduced to specific aspects of pharmaceutical care in primary and secondary health care.

#### **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

The purpose of the post-graduate study program is to acquire professional training and expertise in the field of pharmaceutical care.

The program should establish experts who will professionally and competently perform work in the field of pharmaceutical care in primary, secondary and/or tertiary health care. Students need to overcome specific disciplines important for the pharmaceutical care and to master the skills and methods of research in those areas. The study program should enable pharmacists to:

Apply knowledge of pharmacotherapy, pharmacokinetics, interpretation of laboratory parameters, adherence, interactions and adverse drug reactions for the development of pharmaceutical care plan that includes identified patient's drug-related problems, treatment goals, problem-solving interventions, monitoring of treatment outcomes and patient counseling.

Apply knowledge about the specific population of patients such as pediatric patients, pregnant women, nursing mothers, geriatric patients and patients with impaired renal and/or liver function for the drug dosage regimen correction and monitoring of treatment outcomes.

Communicate with patients and other members of the health care team through a structured approach.

Counsel patients on improving adherence, prevention of adverse outcomes of interactions and adverse drug reactions. Conduct research in pharmaceutical care.

Apply principles of pharmacoepidemiology and pharmacoeconomics and critically assess evidence-based pharmacotherapy in order to implement a rational therapy for the individual patient. Improve the quality of pharmaceutical care.

Apply knowledge and skills of written and oral presentation of pharmaceutical care plan and patient counseling from practice for education and spreading of the pharmacists expertise.

Implement rational (efficient, safe, economically viable) pharmacotherapy in the individual treatment and in the health care system.

### TABLES AND SUPPLEMENTS

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Supplement 1.1a. Publication of the Faculty: Prospective students informer

## STANDARD 3: GOALS OF THE STUDY PROGRAMME

The aims of the post-graduate study program include acquiring of specific knowledge and skills in the field of pharmaceutical care.

Knowledge and skills in the field of pharmaceutical care include identification and solving of patient's drug-related problems, monitoring of treatment outcomes, interpretation of laboratory parameters and patient counseling through the development and implementation of a pharmaceutical care plan. After completion of the appropriate contents, understanding of the pharmaceutical care and pharmacist role in improving treatment outcomes is expected in patients with: Parkinson's disease, epilepsy, Alzheimer's disease, multiple sclerosis, affective disorders, schizophrenia, anxiety, sleep disturbances, migraine and pain, hypertension, congestive heart failure, ischemic heart disease, hyperlipidemia, atrial fibrillation, anemia, coagulation disorders, asthma, chronic obstructive pulmonary disease, dermatitis, herpes, psoriasis, acne, alopecia, metabolic syndrome, diabetes, thyroid disease, contraception, hormone replacement therapy, diarrhea, constipation, gastroesophageal reflux, peptic ulcer, inflammatory bowel disease, irritable bowel syndrome, rheumatoid arthritis, osteoarthritis, gout and osteoporosis.

Aims of the study program include acquiring knowledge about specific patient populations such as pediatric patients, pregnant women, nursing mothers, geriatric patients and patients with impaired renal and/or liver function, as well as the needs and methods of drug dosage regimen correction and knowledge on methods of monitoring treatment outcomes of patients.

The program aims also comprise the acquisition of communication skills with patients and the members of health care team, improvement of adherence and prevention of adverse outcomes of interactions and adverse drug reactions as well as an understanding of the principles of pharmacoepidemiology and pharmacoconomics, critical assessment of evidence-based pharmacotherapy and quality assessment of pharmaceutical care services. One of the study aims is also acquiring knowledge and skills for the development of written and oral presentations of pharmaceutical care plans and counseling of patients in practice.

The ultimate goal of the study program is the implementation of a rational (efficient, safe, economically viable) pharmacotherapy in the individual treatment and in the health care system.

### TABLES AND SUPPLEMENTS

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Supplement 1.1a. Publication of the Faculty: Prospective students informer

## STANDARD 4: COMPETENCIES OF GRADUATED STUDENTS

By completing the post-graduate study program in Pharmaceutical Care, the student receives professional education and becomes an expert in the field of Pharmaceutical care.

A pharmacist in collaboration with the patient and other health care professionals applies his/her knowledge and skills to solve drug-related problems of the patient in order to maintain or improve the patient's quality of life.

Key elements of competences:

- Improving knowledge about specific diseases and treatment options
- Establishing a professional relationship with the patient
- Gathering information about the patient and assessing its significance in terms of patient care
- Identifying the expectations of the patient relative to the treatment
- Identifying actual and potential problems associated with the medicine
- Creating a plan, offering suggestions for treatment options, dosages, treatment regimen, routes of administration, and ways to improve adherence
- Referring to a doctor when necessary
- Developing, implementing and monitoring treatment outcomes
- Documenting information

The main outcome of learning is to apply the knowledge and skills in Pharmaceutical care for solving pharmacotherapeutic problems of individual patients or specific patient groups.

Upon completion of specialized studies in Pharmaceutical care, it is expected that the pharmacist will be able to:

- Apply knowledge in pharmacotherapy, pharmacokinetics, interpretation of laboratory parameters, adherence, interactions and adverse reactions, in order to create a pharmaceutical care plan that includes identification of drug-related problems of the patient, treatment goals, pharmacist interventions to solve problems, plan for monitoring of treatment outcomes and patient counseling
- Apply knowledge in specific patient populations (pediatrics, pregnancy, elderly, patients with altered renal and/or liver) in order to correct dosing regimens of medicines and monitor the outcome of treatment
- Have a structured approach to communicate with patients and other members of the health care team
- Counsel patients on how to improve adherence, prevent the adverse outcomes and drug interactions. Conduct research in the pharmaceutical care
- Apply the principles of pharmacoepidemiology and pharmacoconomics and critically appraise evidence-based pharmacotherapy in order to implement rational pharmacotherapy. Improve pharmaceutical care service quality
- Use the knowledge and skills in written and oral presentation of pharmaceutical care plans and patient counseling, in order to improve knowledge of other pharmacist involved in patient care

- Implement a rational (effective, safe, economically viable) pharmacotherapy in the treatment of individual patients in the health care system

Upon completion of these studies, the student will be able to work independently in the field of Pharmaceutical care.

#### **TABLES AND SUPPLEMENTS**

[Supplement 4.1. Diploma supplement](#)

## STANDARD 5: CURRICULUM

The post-graduate study program in Pharmaceutical Care allows students to improve their knowledge, skills and abilities gained through integrated undergraduate and graduate studies in pharmacy and related disciplines. Students are trained to apply specific knowledge and skills in developing and implementing a pharmaceutical care plan in order to implement rational (efficient, safe, economically viable) pharmacotherapy in the treatment of an individual patient and the health care system. The course lasts three semesters and includes 11 training modules. In the first year students will attend the following 8 modules: Development of a pharmaceutical care plan, Interpretation of laboratory parameters and Medicines information sources, Pharmaceutical care in the treatment of diseases of the central nervous system, Pharmaceutical care in the treatment of cardiovascular diseases, Pharmaceutical care in the treatment of respiratory, infectious and skin diseases, Pharmaceutical care in the treatment of endocrine diseases, Pharmaceutical care in the treatment of diseases of the gastrointestinal and musculoskeletal system, Pharmaceutical care in pediatric patients, pregnant women, nursing mothers, geriatric patients and patients with impaired renal and/or liver function, Communication skills, adherence, interactions and adverse drug reactions, Research in the field of pharmaceutical care. The total number of active classes for the first year is 600, and by passing all the exams the student gains a total of 60 ECTS. In the second year the student attends two mandatory and one elective module. Mandatory modules are - Pharmacoepidemiology and pharmacoconomics, The critical assessment of the results of published studies, Evaluation of quality in pharmaceutical care and Presentation of case studies. Also, the student selects one elective module from the corresponding block, which includes - Implementation of pharmaceutical care in primary care. Self-medication, phytotherapy, dietetics; Public health or Implementation of pharmaceutical care in secondary health care. Pharmaceutical care in cancer therapy, supportive and palliative treatment; Drug List. The modules in the second year of study include additional 30 ECTS, with 300 active classes. The student has to pass all the exams of curriculum modules in order to access the preparation and presentation of the final thesis (analysis and presentation of the cases in practice), in accordance with the Statute and the Rules of post-graduate studies of the Faculty.

### 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 \(printed or electronic form at the institution website\)](#)

## STANDARD 6: QUALITY, MODERNITY AND INTERNATIONAL HARMONIZATION OF THE STUDY PROGRAM

The scope of the post-graduate study program in Pharmaceutical care, Faculty of Pharmacy, University of Belgrade, encompasses different aspects and important program topics enabling student to improve knowledge and skills in the relevant field of pharmacy - Pharmaceutical care.

The role of the pharmacist is changing significantly in recent years in the world as well as in our country, implying active participation of pharmacists as drug experts, in direct patient care. Knowledge and skills regarding the individualization of therapy and taking responsibility for patient therapy, follow modern trends in the pharmacy profession.

Curriculum of academic specialistic studies: *Pharmaceutical care* is in line with similar recognized European programs. The level of presentation of certain professional areas, the scope and content of the course, the way of conducting the educational process offered in our study program, are comparable with the corresponding educational programs at foreign institutions of higher education. Students are thus considered eligible to participate in national and international, multidisciplinary professional research and development projects.

Program from the University of Aberdeen, Scotland (Appendix 6.1. ) served as a model for our course program - the content is mostly the same and involves the planning and delivery of Pharmaceutical care evidence - based, tailored to the individual patients' needs; pharmacotherapy of specific diseases/ conditions. Moreover, we followed the program of the University of Brighton, United Kingdom (Appendix 6.2.), which served as a platform for the organization of the practical part of the course - co-operation with colleagues from the practice and their tutoring role. The third program to which we share the objective, methodology and key aspects of the course, is a program of the University of Manchester, United Kingdom (Appendix 6.3.) - education of pharmacists who will become a role model in conducting and delivering Pharmaceutical care and develop pharmacist profession in the future; increase clinical knowledge, optimize drug therapy and dedicate to continuous learning based on problem solving experience.

In Appendix 6.4., a document of the International Pharmacy Association (International Pharmaceutical Federation (FIP)) is presented, which includes recommendations and compliance with appropriate good practice in European institutions.

### TABLES AND SUPPLEMENTS

Supplement 6.1,2,3. Documentation of at least three accredited international programs to which the presented study program is harmonized to

Supplement 6.4a, 6.4b, 6.4v, 6.4g. Recommendations or accordance with the representative good practices of the European institutions



## STANDARD 7: STUDENT ENROLLMENT

In accordance with the needs of the profession, the post-graduate study program - Pharmaceutical Care enrolls students who meet the requirements provided by the Regulations of the post-graduate studies, Faculty of Pharmacy and the Regulations of conditions, manner and procedure for enrollment to the second and third level of studies at the University. The call for enrollment is open to the public. It is published by the University of Belgrade in means of public information.

The number of students who enroll the post-graduate study program - Pharmaceutical Care is established on the base of the general plan for study programs enrollment of the Faculty of Pharmacy adopted by the Council of the Faculty of Pharmacy and delivered to the University Council. University of Belgrade announces a joint call for the enrollment of students in post-graduate studies.

Based on the available physical and human resources of the higher education institution, the number of students who enroll the post-graduate study program Pharmaceutical care is 45.

Candidates are eligible to apply if they have completed the Faculty of Pharmacy or Faculty of Medicine. Knowledge of the English language is required for attending post-graduate study program.

Priority in the selection, have candidates with a higher average score on the previously completed studies, a higher average mark in the subjects that are of importance for this post-graduate course, as well as candidates with positions in - primary / secondary / tertiary health care.

### TABLES AND SUPPLEMENTS

Table 7.1. Review of the number of students being admitted to the study program

Table 7.2. Review of the number of students per year of the study program in the current school year

Supplement 7.1. Open call for the admission of applicants

Supplement 7.2. Rule book on Specialized Academic Studies

Supplement 7.3. Conditions for the enrolment of students (abstract from the institution Status or other document)

## STANDARD 8: EVALUATION AND PROGRESS OF STUDENTS

Evaluation of students is done by monitoring the students' professional achievements on the basis of points gained by fulfilling pre-exam and exam requirements.

Practical teaching or academic research and pre-exam requirements, are evaluated with a certain number of points, depending on the subject. Exams are taken in writing. The maximum number of points for pre-exam requirements for all subjects is 30, and for the exam 70. Exam in each subject is defined by subject's curriculum. The final score depends on accomplishment during the teaching and success in the written exam, which is organized after completion of subject's classes.

Communication between teachers and students is achieved through mentoring. The students are allowed to consult the subject teacher in the time provided for consultation, to participate in research or to study given topic independently, through seminary.

The students' success on the exam is expressed with grade from five (5) to ten (10), which is based on the achieved number of points.

### TABLES AND SUPPLEMENTS

Table 8.1. Collective list of points for each of the courses that the student acquires through exam prerequisites and the final exam

Table 8.2. Statistical data on the progress of students on the study program

## STANDARD 9: TEACHING STAFF

For the realization of the post-graduate study program in *Pharmaceutical Care*, the required number of teachers with the appropriate and necessary qualifications and competencies is provided. Eight teachers participate in this course (seven teachers are employed full-time in the institution, and one teacher is hired on contract) as well as three associates (all employed full-time in the institution). Of the total number of teachers, six teachers have the academic rank of professor, and two teachers have the rank of assistant professor. Average load of teachers in the course program is 1.04 classes per week, and in the Institution 6.32 classes per week. Percentage of teaching held by teachers employed full-time is 91.38%.

Average load of associates in the study program is 7.00 classes per week, and in the Institution 11.90 classes per week.

### TABLES AND SUPPLEMENTS

Table 9.1. Scientific, artistic and professional qualifications of teachers and responsibility in teaching

Table 9.2. List of teachers engaged in the study program

Table 9.3. Summary review of number of teachers in certain scientific disciplines and narrow disciplines in scientific or artistic areas

Table 9.4. List of teaching associates engaged in the study program

Supplement 9.1. Copies of work cards or work contracts of teaching staff (if accreditation of study program is required)

Supplement 9.2. The Rulebook about election of teachers (if accreditation of study program is required)

[Supplement 9.3. The book of teachers \(with information specified in identical way as in tables from standards, if tables are not enclosed\)](#)

Supplement 9.4. Evidence about public availability of information about teachers and teaching associates (publication or website of the Institution)

Supplement 9.5. Teaching load and summary review of teachers and number of classes.

## STANDARD 10: ORGANIZATION AND RESOURCES

For conducting the post-graduate study program - Pharmaceutical Care at the Faculty of Pharmacy, the Faculty possesses adequate space and equipment necessary to perform the course appropriately, equipped auditoriums and an amphitheater for monitoring of teaching, library stocked with books, textbooks, reference and scientific journals as well as a computer laboratory. Within the faculty there is a computer room, where problem/team based learning takes place, as well as an internet room. As part of the IT support for students, databases for search of electronic available journals are available.

The necessary number of teachers, teaching assistants, associates and technical assistants is provided to perform the study course.

### TABLES AND SUPPLEMENTS

Table 10.1. List of rooms with areas in the faculty building in which lectures are conducted on this study program

Table 10.2. List of equipment for conducting study program

Table 10.3. List of library units which are relevant for study program

Table 10.4. List of books which are available to students on study program

Table 10.5. Literature coverage of mandatory courses (books, collections, practicum which are in libraries or in stock)

Supplement 10.1. Inventory book

Supplement 10.2. Proof of existing information technology, number of internet connections, etc.

## STANDARD 11: QUALITY CONTROL

In order to control the quality of the post-graduate study program in Pharmaceutical care, the Faculty of Pharmacy ensures the implementation of established standards and procedures for evaluation of the study program quality through program evaluation during the study, as well as the evaluation of students' competence, in order to continually monitor and improve the quality in terms of curriculum, teaching, teaching staff, evaluation of students, textbooks and literature .

The quality control of the study program is carried out periodically through self-assessment (annually) and external quality control (every three years).

The quality control of the study program provides active participation of the students and their evaluation of program's quality.

Documents on quality assurance of the Faculty of Pharmacy in Belgrade are presented in the attachment.

### TABLES AND SUPPLEMENTS

Table 11.1. List of members of Commission for quality control

Supplement 11.1. Report about results of self-evaluation process of the study program

Supplement 11.2. Published document – Quality assurance politics

Supplement 11.3. Regulations on Textbooks

Supplement 11.4. Extract from the Statutes of the institution which regulates foundation and scope of work of Commission for quality assurance

## STANDARD 12: DISTANCE LEARNING

The Institution does not organize distance learning.