

EDUCATION AND RECOGNITION OF PROFESSIONAL QUALIFICATIONS IN THE FIELD OF MEDICAL BIOCHEMISTRY IN SERBIA

EDUKACIJA I PRIZNAVANJE PROFESIONALNIH KVALIFIKACIJA U OBLASTI MEDICINSKE BIOHEMIJE U SRBIJI

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Summary: Medical biochemistry is the usual name for clinical biochemistry or clinical chemistry in Serbia, and medical biochemist is the official name for the clinical chemist (or clinical biochemist). This is the largest sub-discipline of the laboratory medicine in Serbia. It includes all aspects of clinical chemistry, and also laboratory hematology with coagulation, immunology, etc. Medical biochemistry laboratories in Serbia and medical biochemists as a profession are part of Health Care System and their activities are regulated through: the Health Care Law and rules issued by the Chamber of Medical Biochemists of Serbia. The first continuous and organized education for Medical Biochemists (Clinical Chemists) in Serbia dates from 1945, when the Department of Medical Biochemistry was established at the Pharmaceutical Faculty in Belgrade. In 1987 at the same Faculty a five years undergraduate branch was established, educating Medical Biochemists under a special program. Since school-year 2006/2007 the new five year undergraduate (according to Bologna Declaration) and postgraduate program of four-year specialization according to EC4 European Syllabus for Post-Graduate Training in Clinical Chemistry and Laboratory Medicine has been established. The Ministry of Education and Ministry of Public Health accredits the programs. There are four requirements for practicing medical biochemistry in the Health Care System: University Diploma of the Faculty of Pharmacy (Study of Medical Biochemistry), successful completion of the profession exam at the Ministry of Health after completion of one additional year of obligatory practical training in the medical biochemistry laboratories, membership in the Serbian Chamber of Medical Biochemists and licence for skilled work issued by the Serbian Chamber of Medical Biochemists. The process of recognition of a foreign higher education document for field of medical

Kratak sadržaj: Medicinska biohemija je uobičajeni naziv za kliničku biohemiju ili kliničku hemiju u Srbiji, dok je medicinski biohemičar zvaničan naziv za kliničkog hemičara (ili kliničkog biohemičara). Medicinska biohemija je najveća pod-disciplina laboratorijske medicine u Srbiji. Ona obuhvata sve aspekte kliničke hemije, kao i laboratorijske hematologije sa koagulacijom, imunologijom itd. Medicinske biohemijske laboratorije u Srbiji i medicinski biohemičara kao profesija su deo zdravstvenog sistema i njihove aktivnosti su regulisane Zakonom o zdravstvenoj zaštiti i pravilima Komore biohemičara Srbije. Prva kontinuirana i organizovana edukacija medicinskih biohemičara (kliničkih hemičara) u Srbiji datira iz 1945. godine, kada je na Farmaceutskom fakultetu u Beogradu otvoren Zavod za medicinsku biohemiju. Na istom fakultetu je 1987. godine uvedene su petogodišnje studije medicinske biohemije po zasebnom programu. Počev od školske 2006/2007 petogodišnji program je inoviran i prilagođen Bolonjskoj deklaraciji, i pripremljen je četvorogodišnji program specijalističkih studija prema preporukama evropskog silabusa grupe EC4 za posle diplomsko usavršavanje u kliničkoj hemiji i laboratorijskoj medicini. Ministarstva zdravlja i obrazovanja akreditovala su oba programa. Za praktikovanje medicinske biohemije u zdravstvenoj službi neophodna su četiri uslova: univerzitetska diploma završenih studija medicinske biohemije na Farmaceutskom fakultetu, završen jednogodišnji staž i položen stručni ispit, kao i licenca Komore biohemičara Srbije. U Republici Srbiji proces priznavanja strane diplome u oblasti medicinske biohemije inicira zainteresovani kandidat. Proces priznavanja stranih diploma sprovodi se na Univerzitetu, pri čemu se primenjuje domaća i internacionalna legislativa.

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biochemistry is initiated on request by Candidate. The process of recognition of foreign higher education documents is performed by the University. In the process of recognition in Serbia national legislations are applied as well as international legal documents of varying legal importance.

Keywords: Medical Biochemistry, education, professional qualifications, recognition, Serbian procedure

Introduction

Medical biochemistry is the usual name for clinical biochemistry or clinical chemistry in Serbia, and medical biochemist is the official name for the clinical chemist (or clinical biochemist). This is the largest sub-discipline of the laboratory medicine in Serbia. It includes all aspects of clinical chemistry, and also laboratory hematology with coagulation, immunology, etc. Medical biochemistry laboratories in Serbia and medical biochemists as a profession are part of Health Care System and their activities are regulated through the Health Care Law and rules issued by the Chamber of Medical Biochemists of Serbia.

The first continuous and organized education for Medical Biochemists (Clinical Chemists) in Serbia dates from 1945, when the Department of Medical Biochemistry was established at the Pharmaceutical Faculty in Belgrade. Further development in the education of Medical Biochemists was in 1955 with the introduction of a postgraduate specialization in Medical Biochemistry at the Pharmaceutical Faculty of Belgrade University. In 1987 at the same Faculty a four years undergraduate branch was established, educating Medical Biochemists under a special program, and in 1991 four-year study become five-year study. In order to get a license to work in clinical chemistry laboratories, students must have one year practical work experiences in hospital laboratories after graduation (1).

Since school-year 2006/2007 as a result of the Decision of the University Senate in Belgrade the Faculty of Pharmacy has been offering courses according to new curricula and syllabuses, entirely in the line with the Bologna Declaration, i.e. with the study programmes of the EU member-states. The Bologna process represents a standardization of the European higher education area thus enabling compatibility and comparability of different study programmes, mobility of students and teaching staff as well as the possibility of degree recognition (2). One of important attainments of the Bologna process is the European Credit Transfer System (ECTS). In order to meet the requirements of the National Accreditation Committee the adjusted study syllabuses have been adopted for the integrated graduate five years studies of Pharmacy and **Pharmacy-Medical Biochemistry**.

Ključne reči: medicinska biohemija, edukacija, profesionalne kvalifikacije, priznavanje, procedura u Srbiji

Recognition is the process of determining the equality of a foreign higher education document with a document of a related or the same profession issued in the state where recognition is requested. The term *Recognition* is different from the terms: *Equivalence* (lat. *aequus* – equal and *valere* – to be worth), which implies that the foreign higher education document is given the same meaning and completely the same value that the similar document has in the country where the process is underway, and *Nostrification* (lat. *noster* – ours and *facere* – to make), which means to confirm the validity of a foreign document and make it part of own system of higher education and qualifications.

The recognition of studies, parts of study programmes, certificates, diplomas and qualifications obtained in another country, represents an important measure for promoting academic mobility. In the 2001 *Prague Communiqué* European ministers have called upon the existing organizations and networks, such as ENIC and NARIC, to promote at the institutional, national and European level simple, efficient and impartial recognition based on the *Lisbon Recognition Convention* (2, 3). Recognition is the official confirmation by an authorized body about the evaluation of qualifications awarded abroad for the purpose of accessing educational and/or professional activities. An authorized body is an institution in charge of making obligatory decisions regarding the recognition of foreign qualifications.

The process of recognition of foreign higher education documents in field of Medical Biochemistry in Serbia is performed by the University (4).

Undergraduate Studies at the Faculty of Pharmacy

Syllabus Pharmacy–Medical Biochemistry

The program of Syllabus–Medical Biochemistry at Faculty of Pharmacy of Belgrade University is designed for candidates who plan to pursue a career in medical biochemistry laboratories within the Health Care System or a career in pure and applied medical biochemistry research and education. The studies at the Faculty of Pharmacy are integrated academic studies that last for five academic years, i. e. 10 semesters, including the work on the Diploma Paper,

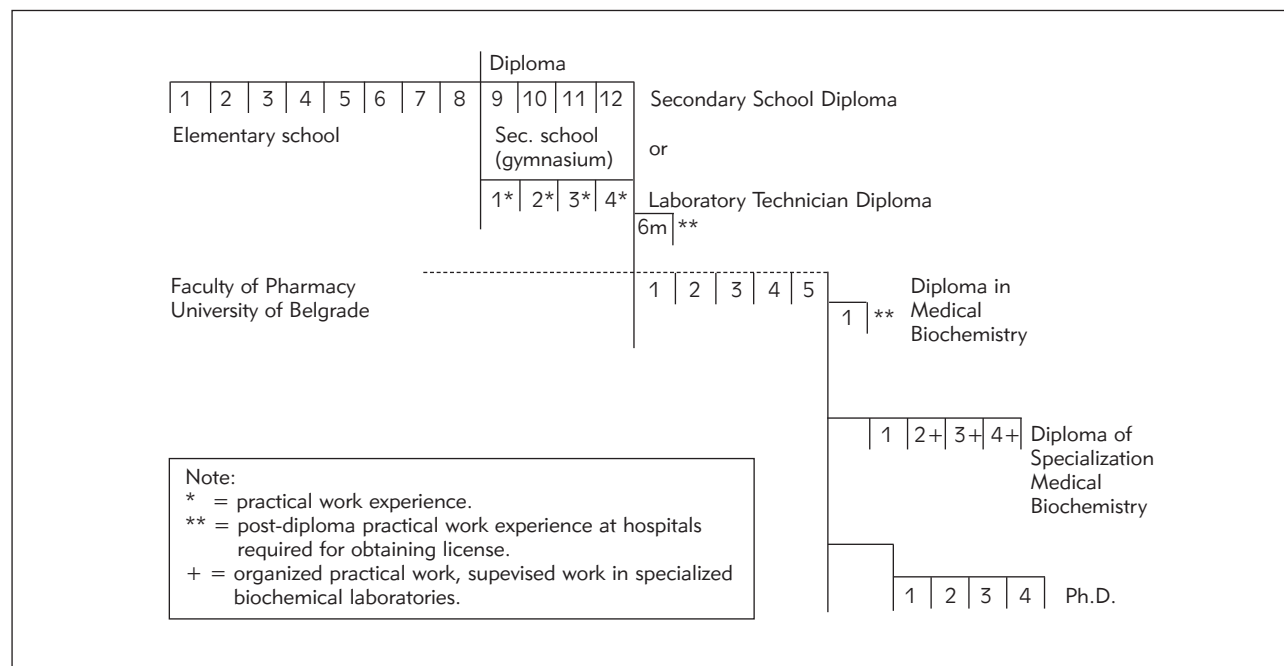


Figure 1 Educational outline of Medical Biochemist in Serbia.

and result in 300 ECTS credits realized through two syllabuses: Pharmacy and Pharmacy-Medical Biochemistry. Having finished the studies, students obtain a degree of Master of Pharmacy and Master of Pharmacy-Medical Biochemist (5–7).

The syllabus Pharmacy-Medical Biochemistry encompassing 35 compulsory courses and 18 optional courses (out of which a student should choose 9). In the first year a student attends 11 courses, in the second 8, in the third 7, in the fourth 8 and in the fifth year of their academic studies a student attends 10 courses. In the 10th semester it is obligatory for the student to write a final (Diploma) paper, worth 10 ECTS credits and allocated 150 working hours. The 10th semester also comprise 75 hours of pre-graduate practice work, worth 2 ECTS credits. All subjects are divided into the following groups: general-academic (represented with 15.3%), theoretical-methodological (17.7%) and applied professional (32.3%). The optional courses make 19.7% of the overall score of ECTS. The majority of optional courses are professional and applied professional subjects.

Each subject from the study programme is assigned a value expressed in ECTS credits and the scope of studies as a whole is expressed as an overall of ECTS credits. One ECTS credit stands for 25 to 30 hours a student has to spend on all types of class work and individual study to complete all planned learning activities. ECTS credits are allocated to a specific subject based on the estimated overall time spent in order for an average student to acquire the expected knowledge and skills that the subject in question requires. A total of 60 ECTS credits equal the overall

workload of an average student within 40-hours work week during one academic year. Student earn their ECTS credits only after passed exams, i.e. only after having completed all the necessary requirements outlined by the curriculum and the syllabus.

The performance of students in learning activities is monitored and expressed through points. By fulfilling the pre-exam obligatory activities and by passing the final exam a student can score a total of 100 points. Pre-exam activities bring a minimum of 30 and a maximum of 70 points. Students obligatory activities consist of: class activities (lectures, theoretical exercises and laboratory practice, consultations), individual study, assignments (tests), exams, final paper and voluntary work in the local community.

The planned teaching methods encompass lectures, laboratory (experimental) exercises that students do an own, theoretical exercises and course-work. Interactive teaching, implemented at the Faculty of Pharmacy, implies students' active participation in the teaching process for better acquisition of necessary knowledge and skills.

Creative work and research in medical biochemistry requires broad formal training in basic natural sciences and medicine and extensive laboratory experience. During the studies Pharmacy-Medical Biochemistry, medical biochemist is qualifying for work in clinical-biochemical, toxicological and sanitary laboratory dealing with medical biochemical, toxicological and sanitary practice (5). In the course of education, a student is expected to acquire **knowledge** on: human organism, disease, role of biochemical laboratory in diagnostics and health care

system. In the course of the study, a student is expected to acquire abilities and **skills** for: laboratory work, quality control that assures continuous process of checking and assessment measuring values to obtain reliable result and medicinally relevant information, handling with instruments and equipments, protection of laboratory staff and safe handling with chemicals and biological materials as well as pharmaceutical/medicinal waste.

The Specialization and Doctoral Academic Studies in Medical Biochemistry

The Faculty of Pharmacy in Belgrade organizes the specialization studies in the health care area in accordance with the Health Protection Act of the Republic of Serbia. However, in order to enroll in this course one should get the approval of Serbian Ministry of Health, on the basis of the request from the director of the organization in which applicant medical biochemists works, and according the *Rules and regulations: on the health care specialization studies* (www.pharmacy.bg.ac.rs).

The specialists in medical biochemistry up to now are educated in a special 3-year program at the Faculty of Pharmacy or Medical Faculties, covering the organized lectures, practical training in laboratories and examinations. The final examination requires an overall knowledge in medical biochemistry and clinical chemistry. There are also three specialisation for clinical medical biochemists: Laboratory Endocrinology, Clinical Enzymology and Clinical Immunochemistry. The program lasts one year. On the completion of the program, a Diploma of Subspecialization in the field is awarded. The Ministry of Education and Ministry of Public Health accredits the programs.

Except this possibility up to 2006 organized postgraduate studies in medical biochemistry last two year. After passing the examinations, the student is assigned and experimental project by the supervisor. Data obtained from the experiments are presented in a written form and defended before a commission. Candidates for a doctoral degree usually had a Master of Science Degree. All candidates are assigned a project by their supervisor, which they have to work out experimentally. They then write a thesis, which must be defended in front of the commission.

Since school-year 2006/2007 the new five year undergraduate (according to Bologna declaration) and postgraduate program of four-year specialization according to EC4 European Syllabus for Post-Graduate Training in Clinical Chemistry and Laboratory Medicine has been established (8). Specialization in medical biochemistry takes four years, and is divided into two stages:

Year 1: The subjects in the first year of post-graduate scientific study of medical biochemistry are accepted as the theoretical part of the specialization;

Years 2–4: Comprise residency, mainly in Departments of Laboratory Diagnostics in University Hospitals and partly in specialized biomedical laboratories in general or specialized hospitals.

The Faculty of Pharmacy in Belgrade organizes the PhD academic studies. Medical Biochemistry is one of the doctoral studies moduls. This studies last three years, i.e. six semesters with total of 180 ECTS credits. A student who completes the PhD academic studies acquires the scientific title Doctor of Medical Science – Pharmacy (Doctor of Pharmaceutical Science). The purpose of this study programme is to allow the students who have met the necessary requirements and who show affinities both toward scientific reasearch and systematic understanding of particular areas of medical biochemistry to master skills and methods of reasearch in given areas in order to be competent for future individual reasearch work (9–10). The purpose of this programme is to create new scientific-research oriented young generations of reasearchers who would reach new boundaries within their specific areas of interest during their professional careere, improve reasearch and teaching methods and become competent mentors to students of undergraduate, graduate and PhD studies (11).

Requirements for starting a career in medical biochemistry

Medical biochemistry laboratories in Serbia and medical biochemists as a profession are part of the Health Care System and their activities are regulated through: The Health Care Law and The Rules issued by the Chamber of Medical Biochemists of Serbia. According to the number and complexity of the tests performed as well as to the qualifications of the personnel in laboratory the medical biochemistry laboratories are: General (in a primary health care setting), Special (in an community or country hospital), Subspecial (in a special hospital or clinical hospital), and Clinical (in a University clinical hospital). Clinical medical biochemistry laboratories as a part of the University hospitals are a teaching units for undergraduate and postgraduate education of medical biochemists. Private laboratories are either general or special laboratories. All medical biochemistry laboratories and the list of tests performed are licenced through the Ministry of Health.

There are four requirements for practicing medical biochemistry in the Serbian Health Care System:

1. University Diploma of the Faculty of Pharmacy (Study of Medical Biochemistry),

2. Successful completion of the profession exam at the Ministry of Health after completion of one additional year of obligatory practical training (interim) in the medical biochemistry laboratories,
3. Membership in the Serbian Chamber of Medical Biochemists,
4. Licence for skilled work issued by the Serbian Chamber of Medical Biochemists

In 2006 according to Health Law the new institution – The Chamber of Biochemists of Serbia has been established with aim to do licensing of the medical biochemists. In cooperation with Ministry of Health the Chamber prepared the documents that regulate the program of Continuing Medical Education (CME) and Regulation of Licensing of Medical Biochemists (11). The program of CME should be accredited by the Republic Health Council, and in program realization the Pharmaceutical and Medical Faculties, The Society of Medical Biochemists and The Chamber of Biochemists of Serbia are participated. The License of medical biochemists will be renewed every 7 years on the basis of successful completion of continuing education requirements during that period. Minimum requirement for renewal of the license is 24 credits per year gathered from different types of the programmes (courses, symposiums, congresses, publications, etc.) (12).

A variety of programs organized by various groups, for example the Faculty of Pharmacy (scientific degrees), Society of Medical Biochemists (symposia, congresses), Chamber of Medical Biochemists (courses), programs of other scientific societies (research and publishing activity), and other activities will be recognized as continuing education by *The Rules of Continuing Education of Medical Biochemists issued by the Chamber of Medical Biochemists* (www.komorabiohemsrbije.org.rs) (12).

The Society of Medical Biochemists of Serbia (www.dmbj.org.rs) was established in 1955, and since its institution until these days, the Society has accomplished significant activities in the field of education of clinical chemists through the organization of congresses (biennial), Biochemical days (every year), Innovations in laboratory medicine (every year), Congresses of Balkan Clinical Laboratory Federation, Scientific Conference »Professor Ivan Berkes« (every year), EFCC Symposium for Balkan Region, Educational seminars, etc. The Society has significant publishing activity through Journal of Medical Biochemistry (www.dmbj.org.rs; www.versita.com/science/medicine/jmb) and professional-methodological guidebooks for the field of medical biochemistry.

Recognition of a foreign higher education document in Medical Biochemistry

National legislatives

The process of recognition is performed according to the rules stating that the holder of the document should be given rights equal to those he/she obtained in his native country in coordination with the legislations of the country where recognition is requested. In order to award to the holder of a foreign higher education document the degree and type of professional qualification, expert, academic or scientific title and accompanying rights, it is possible in exceptional cases to propose additional conditions for the full recognition of qualifications (additional exams or other conditions), or to consider the possibility of partial or conditional recognition. Such cases should still be considered more as an exception than as a rule, and in such cases it is necessary to prove and argue for the existence of essential differences in the outcomes of learning, competences, difficulty of the programme, and/or acquired rights.

According to the Serbian Law on Higher Education (Section XVI, Articles 104 and 105), there are two different types of recognition:

1. Recognition of professional qualifications–foreign higher education documents for the purpose of employment, that is, access to the labour market. In the process of recognition the type and level of studies are determined and the expert, academic, or scientific title is awarded.
2. Academic recognition–for the purpose of continuing education, implying the recognition of a part of the study programme for the purpose of inclusion into the same study cycle or recognition of a diploma for a finished level of studies for the purpose of entry into higher levels of education (specialist studies, master and doctoral studies) (10).

In the process of recognition in Serbia national legislations are applied as well as international legal documents of varying legal importance, where it is also necessary to consider their appropriate legal status. Recognition of qualifications obtained abroad should in Serbia be done also in accordance with all relevant legislations and conventions, recommendations and codes of good practice of the Council of Europe and UNESCO, European Union Directives, including those on professional recognition, other rules and regulations of the European Union, e.g. those that regulate recognition of qualifications obtained within an EU mobility programme, such as SOCRATES and ERASMUS, international agreements, bilateral and multilateral agreements concluded between countries and/or between higher education institutions.

On the basis of Article 104, Paragraph 5, of the Law on Higher Education («Službeni glasnik RS», Nr. 76/05), the Council of the University of Belgrade, at the session held on December 14, 2005, has drawn up the GUIDELINES FOR RECOGNITION OF FOREIGN HIGHER EDUCATION DOCUMENTS. In Article 1 of GUIDELINES is stated that recognition of a foreign higher education document is a process to acknowledge the rights of the holder of the document concerning continuing education, that is, concerning employment. During the course of the process are acknowledged the right to continue higher education; type and level of studies, and professional, academic or scientific title (12).

On the basis of Article 104, Paragraph 5, of the Law on Higher Education («Službeni glasnik RS», Nr. 76/05, 100/07–authentic interpretation and 97/08) and Article 153 of the Statute of the University of Belgrade («Glasnik Univerziteta u Beogradu» Nr. 131/06, 140/08, 143/08 and 150/09), and in accordance with the Convention on the Recognition of Qualifications Concerning Higher Education in the European Region drawn up by the European Council and UNESCO (Lisbon Recognition Convention), the Senate of the University of Belgrade, has drawn up on February 2010 the new GUIDELINES For Recognition of Foreign Higher Education Documents for the Purpose of Continuing Education (4, 13).

Serbian Law on Higher Education prescribes the procedure of *recognition* of foreign higher education documents that relies on the principles of the Lisbon Recognition Convention, with an emphasis on acquired competences (knowledge and skills), outcomes of study and rights given by the document regarding continuing education and employment in the state where it was obtained. Thereby ends the long term practice of diploma nostrification and detailed comparison of every passed exam with its counterpart in the domestic higher education system and the relevant study plan and programme.

The new Guidelines changes the existing practice in the following way: reduces the amount of necessary documentation that is delivered with the request (encompasses verified photocopies and translations of the diploma and its supplements/transcript about passed exams, study programme as it is available via the internet page of the higher education institution that has issued the document and a shortened list of accompanying documentation); reduces the number of verified photocopies of documents to be delivered; speeds up the process of gathering information from the ENIC centre by introducing e-mail communication in the process of information gathering; shortens the deadlines for realization of specific activities within the procedure; decision making is attributed to the manager of the study programme within which the candidate wishes to continue studying, thus ending the process of

multilevel decision making with the participation of an expert body from the autonomous higher education institution which has in most cases affected the efficacy and duration of the recognition procedure; authorized body from the higher education institution reaches the decision that is final in the managerial process, on the basis of the decision made by the manager of the study programme.

The Guidelines serve to assert the manner of and procedure for the recognition of foreign higher education documents for the purpose of continuing education at the University of Belgrade and the schools it comprises (University). In the recognition procedure assessment of the foreign study programme or parts of the study programme is done. The same procedure is applied to candidates from countries that have not signed the Lisbon Recognition Convention.

In the process of recognition of foreign higher education documents discrimination is forbidden on any grounds, such as: sex, race, language, invalidity, religion, political or other conviction, national, ethnic or social background, belonging to a national minority, financial or other status. The procedures and criteria for the recognition of foreign higher education documents are publicly available, transparent, coherent and reliable.

Process of recognition

The process of recognition of a foreign higher education document for field of medical biochemistry is initiated on request by Candidate. The process of recognition of foreign higher education documents is performed by the University. A higher education document obtained abroad is a diploma or other public document issued by an authorized higher education institution confirming successful completion of a higher education study programme, that is, a part of the study programme that is graded and documented. Recognition of a foreign higher education document for the purpose of continuing education at the University is a procedure to validate the right of the holder of the document to continue with the started higher education, that is, the right to be included in the levels of higher education, within the selected study programme (13).

The Candidate along with a request for recognition of a higher education document, found in the Guidelines (Form Nr. 1), and a proof of payment of procedural expenses, also submits: verified photocopy of the foreign higher education document; translation into Serbian language of the foreign higher education document verified by a certified translator – not translating the title awarded; verified photocopy of the diploma supplement or transcript concerning passed exams; translation of document from Item 3 into Serbian by a certified translator; verified photocopy of

the decision by an authorized body about the change of name and/or surname for persons who have changed name and/or surname.

After receiving a proper request for the recognition of a document, University, as a rule, sends notice to the ENIC centre of the relevant Ministry to procure information about the following: status of the higher education institution that has issued the document (if the higher education institution that has issued the document is accredited/acknowledged as a part of a system of higher education in the state where the seat of the higher education institution is located); study programme according to which the document was obtained (whether it is accredited in the state where the seat of the higher education institution is located); education system in the state where the seat of the higher education institution is located, if necessary; rights given by the obtained document, that is, outcome of studies and if the obtained document provides entrance into the next level of education; other circumstances pertinent to recognition.

If the foreign higher education institution that has issued the documents is not accredited/recognized as a part of the system of higher education in the state where the seat of the higher education institution is located, rector makes the decision to deny Candidate's request for recognition of the foreign higher education document.

If the foreign higher education institution is accredited/recognized, that is, if the study programme is accredited/recognized, University delivers the request together with complete documentation to the manager of the study programme that the Candidate intends to enroll/continue studying. Manager of the study programme makes the decision about the possibility of recognition of the higher education document/study programme within 15 days of receiving the abovementioned documentation.

Along with the decision, manager of the study programme draws up a report about the possibility of recognition of the foreign higher education document for the purpose of continuing education, using the

form found in the Guidelines (Form Nr. 2). One photocopy of the decision is delivered by the University to the Candidate. The Candidate can, within 8 days of receiving the decision, make an appeal to the University Senate (13).

The decision for recognition may be:

Positive – the right is asserted to continue with the started higher education, that is, the right to be included into the levels of higher education; average grade; number of recognized points in the ESPB system; the determined remaining part of the study programme that the Candidate should complete when continuing with the started level of higher education and the number of points in the ESPB system to be realized;

Negative – Candidate's request is denied due to existence of a substantial difference in the outcome of studies and competences, demands of the study programme, access to further activities – continued studies, or key elements of the programme;

Conditional – right to access the selected study programme is gained under specific conditions that the Candidate should fulfill and that should be listed in the decision.

After reaching the final conclusion, rector makes the decision about the Candidate's request for recognition that will be final in the managerial process. University is obliged to keep the documentation related to the process of recognition of foreign higher education documents permanently. University keeps record about the recognition of foreign higher education documents using the form found in the Guidelines.

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Conflict of interest statement

The authors stated that there are no conflicts of interest regarding the publication of this article.

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