UNIVERSITY OF ŽILINA

DESCRIPTION OF THE STUDY PROGRAMME

Source: SAAVŠ

Name of faculty: Faculty of Electrical Engineering and Information Technology
Name of study programme: Biomedical Engineering
Degree of study: 1.

Higher education institution authority for approving study programmes: Accreditation Board of the University of Žilina in Žilina
Date of approval of the study programme or modification of the study programme: 26.06.2025, No. 790
Date of the last change of the[1] study programme description: 04.12.2025
Link to the results of the last periodic evaluation of the study programme by the higher education institution: does not apply to

<table>
<tr><th>1.</th><th colspan="4">Basic information about the study programme</th></tr>
<tr><td>a</td><td>Name of the study program</td><td>Biomedical Engineering</td><td>Number according to the register of study programmes</td><td></td></tr>
<tr><td>b</td><td>Degree of higher education</td><td>3.</td><td>ISCED-F education degree code</td><td>864</td></tr>
<tr><td>c</td><td>Place(s) of delivery of the study programme</td><td colspan="3">Univerzitná 8215/1, 010 26 Žilina</td></tr>
<tr><td rowspan="2">d</td><td rowspan="2">Name of the field / Combination of two fields of study</td><td rowspan="2">Electrical Engineering</td><td>Number of the field of study</td><td>2675V47</td></tr>
<tr><td>ISCED-F codes of the field/fields</td><td>0713,522</td></tr>
<tr><td>e</td><td>Type of the study programme</td><td colspan="3">academically oriented</td></tr>
<tr><td>f</td><td>Awarded academic degree</td><td colspan="3">Philosophiae Doctor „PhD.“</td></tr>
<tr><td>g</td><td>Form of study</td><td colspan="3">Full-time</td></tr>
<tr><td>h</td><td>Cooperating institutions and the range of study obligations the student fulfils at each of the given institutions</td><td colspan="3">This study program is not common study program</td></tr>
<tr><td>i</td><td>Language or languages in which the study programme is delivered</td><td colspan="3">English language</td></tr>
<tr><td>j</td><td>Standard length of the study expressed in academic years</td><td colspan="3">3 years</td></tr>
<tr><td rowspan="2">k</td><td>Capacity of the study programme (planned number of students)</td><td colspan="3">I. year: 3
II. year: 3
III. year: 3</td></tr>
<tr><td>Actual number of applicants</td><td colspan="3"><table>
<tr><td>Year of study</td><td>AR19/20</td><td>AR20/21</td><td>AR21/22</td><td>AR22/23</td><td>AR23/24</td><td>AR24/25</td></tr>
<tr><td>I. Year</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td><td>0</td></tr>
</table></td></tr>
</table>

[1] *If the change is not a modification of the study programme according to Section 30 of Act No. 269/2018 Coll.*

	Actual number of applicants and students	

Year of study	*AR19/20*	*AR20/21*	*AR21/22*	*AR22/23*	*AR23/24*	*AR24/25*
I. Year	*0*	*0*	*0*	*0*	*0*	*0*
II.Year	*0*	*0*	*0*	*0*	*0*	*0*
III.Year	*0*	*0*	*0*	*0*	*0*	*0*

2.	**Graduate profile and learning objectives**	
a	**Learning objectives of the study programme such as student's abilities at the time of completion of the programme and the main learning outcomes**	The graduate represents a qualified expert educated in the multidisciplinary field of biomedical engineering in the area of electrical engineering. The graduate is ready to present the results achieved within the studied program in front of a wide professional public at professional scientific symposia, conferences, and workshops. The graduate can interpret the results of scientific research activities not only in his native language, but also in the chosen world language. In addition to the presentation of the achieved results, he is also able to appropriately confront them with the expert audience. By applying the acquired knowledge, he can analyse and evaluate the investigated problems, while the common denominator of his work is creativity and creation at the highest cognitive level. He perceives the results of his solving tasks and connected problems as a challenge. He can evaluate the results of his work as well as other professional works using a valid, dependable, and transparent approach. In the process of confronting the results and at the same time in the pedagogical process, in relation to students of lower degrees of study, he uses constructive feedback. From the point of view of acceptance of his performance, he places maximum emphasis on the accuracy and quality of his outputs. He can solve complex problems in the subject area with an independent active approach to the solved problem. To achieve goals, he knows how to eruditely use the potential of computing technology and available literature resources. He connects analytical and synthetic ways of thinking and implementation of these approaches to the solved task, while being able to take a written position on the investigated problem in the form of quality professional publications, works and presentations of his activities. A graduate is an experienced and sought-after expert in the fields of sensorics and non-invasive diagnostics based on electromagnetic principles and in the field of electromagnetic biocompatibility, and its applicability on the labor market is easy. **Learning objectives**: **[CV1] Acquisition of analytical skills and conceptual knowledge:** Analysing and differentiating knowledge acquired mainly through self-study and active approach when searching for relevant information from reliable sources. – Basics of Research Practice, Mandatory optional subjects according to the focus of the dissertation thesis. [**CV2] Acquisition of assessment skills and procedural skills:**

		Critical evaluation of the acquired results. Assessment based on established criteria and through applicable standards. Acquiring the ability to evaluate and argue, distinguishing between relevant and unconfirmed conclusions. - Basics of Research Practice, Mandatory optional subjects according to the focus of the dissertation thesis, Essay to Dissertation Examination and Defence of Written Project for Dissertation Examination. [**CV3] Acquisition of creative competences and metacognitive knowledge:** The ability to combine individual elements into a continuous functional unit. Based on acquired knowledge using an analytical approach, the use of synthesis in the process of creating a new, or different, new form, as proof of the use of the highest mental function. - Basics of Research Practice, Mandatory optional subjects according to the focus of the dissertation thesis, Dissertation Projects I to IV, Scientific publication outputs, The Thesis and Dissertation Defence. **Learning outcomes:** **[VV1]** The student can analyse complex problems in the field of biomedical engineering, using the information acquired in the self-study process. He can take a critical approach to find a solution to problems arising from electrotechnical systems and electromagnetic fields. He can classify and categorize mentioned interactions with different systems. – Basics of Research Practice, Mandatory optional subjects according to the focus of the dissertation thesis. **[VV2]** The student can independently react and solve unpredictable situations, as well as to apply a higher level of decision-making, in the process of conducting experiments and creating numerical models. He can design, analyse, and critically evaluate a complex computational model of the particular problem. He can investigate the practical use of electromagnetic phenomena in selected areas, along with the manifestations that accompany these phenomena. - Mandatory optional subjects according to the focus of the dissertation thesis, Independent scientific work, Dissertation projects I to IV, Scientific publication outputs, The Thesis and Dissertation Defence. **[VV3]** The student can confront the results of his work with the current state of issues in the field of biomedical engineering, while being able to justify the methods and approaches used and the appropriateness of their choice. He can present the results in an adequate way in the form of final reports, projects, or in the form of professional publications. He knows how to argue, draw conclusions, and discuss in front of a professional public about his scientific research. – Independent scientific work, Dissertation

		projects I to IV, Scientific publication outputs, The Thesis and Dissertation Defence. **[VV4]** The student knows how to prepare, compile and present professional documents with an important level of information value, related to the biomedical engineering. He can interpret acquired results of their research work at various levels. With his creative approach, with innovative thinking and critical assessment of the situation, he can eruditely solve problems from the biomedical engineering, or also in its wider contexts. – Independent scientific work, Dissertation projects I to IV, Scientific publication outputs, The Thesis and Dissertation Defence.
b	**Indicated professions for which the graduate is prepared at the time of completion and the potential of the study programme from the point of view of graduate's employability**	U2151003-01118 Electrical engineering specialist in research and development U1321013-01117 Manager in electrical engineering production U2151002-01103 Designer of electrical equipment and systems 2151005 Quality control specialist in electrical engineering 2149999 Other technical specialist not specified elsewhere (except specialists in the field of electrical technologies) 2151004 Specialist electrical engineer designer
c	**Relevant external stakeholders who have provided the statement or a favourable opinion on the compliance of the acquired qualification with the sector-specific requirements for the profession**	The study program does not prepare for a profession requiring an opinion on the compliance of the obtained qualification with sector-specific requirements for the performance of the profession.

3.	**Employability**	
a	**Evaluation of the study programme graduates employability**	Graduates of the biomedical engineering doctoral study program are employed as managers, researchers and specialist workers in companies, institutes, and research centres where the highest degree of critical and constructive thinking, proactive approach, and invention in solving highly professional problems is required, as well as a high degree of responsibility and self-reflection in relation to the work and its results.
b	**Successful graduates of the study programme**	Name and surname: Ing. Martin Bereta, PhD. Professional profile (optional): specialist in research on the influence of the electromagnetic field on living cultures and the communication of cell cultures in the visible spectrum. Company name (job position): head of department, vice dean for education and training, Department of Radiological Technology, Faculty of Health, Catholic University of Ružomberok. Name and surname: Ing. Barbora Czippelová, PhD**.** Professional profile (optional): specialist in the assessment of heart rhythm variability. Name of the companies (job position): scientific and research worker, Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava.

		Name and surname: Ing. Marcel Alman, PhD. Professional profile (optional): specialty in optical and opto-digital laboratory instruments. Company name (job position): ZENA-R Slovakia, s.r.o., Bratislava.
c	**Evaluation of the study programme quality by employers (feedback)**	Biomedical engineering is a long-term and stably established study program in the doctoral degree at the Faculty of Electrical Engineering and Information Technology of the University of Žilina in Žilina. Graduates of this study program find employment mainly in the academic sphere, e.g., University of Žilina in Žilina, Slovakia Academy of Sciences, Jessenius Faculty of Medicine of the Comenius University in Martin, Catholic University in Ružomberok. In the long term, the ability of graduates creatively apply theoretical knowledge and practical skills to solve the most complex research problems and innovation challenges in the field of electrical engineering and biomedical engineering is positively perceived by employers. Proof the truth of these statements is the willingness of practice representatives to cooperate more closely with the department and enter the educational process in various forms, from professional lectures, workshops to project cooperation, in the implementation of which doctoral students also participate. The workplace regularly monitors feedback from graduates' employers, but so far this has been done on a one-to-one basis personal interview. The conclusions of these feedbacks were implemented in the adjustments of the study program as part of its harmonization. In connection with harmonization according to UNIZA's internal quality system, procurement is being approached by feedback from companies, by implementing the evaluation of the following indicators of the graduate - by rating on a scale from 1 (worst) to 5 (best): • whether the graduate demonstrates knowledge and understanding of the studied field and can use it in an original way in the development and/or application of new concepts (e.g., research) in the company; • whether the graduate can creatively solve problems in new or unfamiliar environments and in wider contexts; • whether the graduate can integrate knowledge and make responsible (and ethical) decisions even in extensive, complex, and unclear situations; • whether the graduate can clearly and unequivocally communicate conclusions, their findings, and justifications to the professional and laic public; • whether the graduate has developed educational skills, including independence and autonomy of learning; • whether the graduate can use any world language. To be able to assess the weight of the obtained claims, the approximate number of graduates in the company is also monitored (1-5, 6-10, over 10).

4.	Structure and content of the study programme [2]
a	**Rules for the design of study plans within the study programme**

At the university level, it defines processes, procedures, and structures:

Directive no. 203 - Rules for the Creation of Recommended Study Plans for UNIZA Study Programmes, https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-203-en.pdf

determines the binding procedures for the creation of study plans in the preparation of the draft application for accreditation of the study program or modification of the study program. Study plan of the student determines the time and content sequence of study program subjects and the form of study results assessment. The rules for follow-up between individual subjects are set and described in the study plan.

Directive no. 204 - Rules for creating, modifying, approving, and canceling study programmes at UNIZA, https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-204-en.pdf

sets the rules for creating, modifying, approving, and canceling study programs at UNIZA and when applying for study program accreditation, in which UNIZA asks for granting accreditation to the Slovak Accreditation Agency for Higher Education ("SAAVŠ").

Directive no. 205 - Rules for assigning teachers to provide study allowances of UNIZA programs, https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-205-en.pdf

determination of study program staffing rules and principles how to assign teachers to study programs conducted at the University of Žilina in Žilina ("UNIZA"). A university teacher can work in the functional position of a professor, the position of associate professor, the position of professional assistant, assistant, or lecturer.

Directive no. 212 - Rules for defining the workload of UNIZA creative employees, https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-212-en.pdf

The rules for defining the workload of creative employees at the University of Žilina in Žilina (hereinafter "UNIZA") are based on: a) valid standards of the Slovak Accreditation Agency for Higher Education (hereinafter only "SAAVŠ") for the study program, b) Act no. 131/2002 Coll. on universities as amended, c) Act no. 552/2003 Coll. on the performance of work in the public interest, as amended, d) Act No. 311/2001 Coll. Labor Code as amended, e) Collective agreement.

The rules for defining the workload of creative employees must enable the employee to conduct: a) teaching activities, b) scientific research activities, c) developing their professional, linguistic, pedagogical and digital skills and transferable skills, d) other activities for ensuring the already mentioned activities.

Creative employees of UNIZA can be: a) university teachers working as professors, visiting professor, associate professor, associate docent, docent, professional assistant, assistant, lecturer, b) scientific research workers, c) workers according to letter a) – b) of this paragraph acting in the position of rector, vice-rector, dean, vice-dean and head of department, d) professional staff, research staff, research coordinators, division heads, directors.

Directive no. 213 - Quality Assurance Policies at the University of Žilina in Žilina

https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-213-en.pdf

[2] *Selected characteristics of the content of the study programme can be stated directly in the Course information sheets or supplemented by the information of the Course information sheets.*

The University of Žilina in Žilina has a long-term focus on the creation, introduction and maintaining an effectively functioning internal university quality assurance system of education at UNIZA (hereinafter referred to as "VSK") in accordance with Act no. 131/2002 Coll. about high school ls, as amended, by Act no. 269/2018 Coll. on quality assurance of higher education and on amendments to Act no. 343/2015 Coll. about public procurement and on the amendment and supplementation of some laws, as amended, by standards of the Slovak Accreditation Agency for Higher Education (hereinafter referred to as "SAAVŠ") and the intentions of the university, when it defines "Policies for quality assurance at the University of Žilina in Žilina" as internal regulation (directive) of UNIZA (hereinafter referred to as "UNIZA policy"). The purpose of UNIZA's policies is to establish principles, which are applied to UNIZA through strategies, objectives, procedures, rules, and indicators. The application of the principles is set up in such a way that it can be examined whether in the respective objectives, they applied UNIZA procedures, rules, and indicators correctly.

Directive no. 214 - Structures of the internal quality assurance system

https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-214-en.pdf

This internal regulation was issued in accordance with the provisions of § 15 par. 1 letter b) Act no. 131/2002 Coll. on universities and on the amendment of laws as amended later regulations. This internal regulation defines the structures of the internal quality assurance system for creating, editing, approving and canceling study programs at the University of Žilina in Žilina (hereinafter referred to as "UNIZA") and when applying for the accreditation of a study program in which UNIZA is requesting an award.

Directive no. 217 - Resources to Support Educational, Creative and Other Related Activities of the University of Žilina in Žilina

https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-217-en.pdf

The purpose of issuing this directive is to define the resources of the University of Žilina in Žilina (hereinafter UNIZA), which are used in the implementation of accredited study programs and creative activities regarding ensuring their maximum effectiveness, efficiency, economy, availability, and renewals in accordance with the internal education quality system.

Directive no. 218 - Directive on collection, processing, analysis, and evaluation information to support the management of study programs

https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-218-en.pdf

This directive establishes the rules, procedures and responsibilities regarding the systematic collection, processing, analysis, and evaluation of information to the necessary extent and structure for the management of educational activities and for the management of creative activities and other related activities of the University of Žilina in Žilina (hereinafter referred to as "UNIZA"). It determines the information needed for management defined areas and how to cover it, i.e., sources and responsibilities for collecting information, management of reference information and also regulates access to information analysis according to customer requirements.

Directive no. 219 - Mobility of UNIZA students and employees abroad

https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-219-en.pdf

This directive is part of the internal regulations of the University of Žilina in Žilina (hereinafter "UNIZA"). It is prepared in accordance with Act No. 131/2002 Coll. on universities and amendments of certain laws as amended (hereinafter referred to as the "Higher Education Act"), in accordance with Directive no. 106 of the Statute of the University of Žilina in Žilina (hereinafter referred to as the "Statute of UNIZA"), the Internal by the

UNIZA quality assurance system (hereinafter referred to as "VSK UNIZA"), Directive no. 207 Ethical UNIZA codex, Directive no. 209 Study schedule for the 1st and 2nd degree of university studies at the University of Žilina in Žilina (hereinafter referred to as "ŠP UNIZA") and Directive no. 110 Study schedule for 3. degree of higher education at the University of Žilina in Žilina (hereinafter referred to as "3rd degree on UNIZA"), as well as in accordance with other internal regulations of UNIZA. UNIZA supports mobility of its students and employees all over the world, in all available grant programs and within all programs and fields that are developed and provided at faculties and institutes, and also in similar study programs. Mobility in this document means any study stay, internship, scientific research stay, creative leave stay, stay at the purpose of teaching or training abroad, which is related to the mission and goals of UNIZA with an emphasis on long-term partnerships of UNIZA in the world.

Directive no. 220 - Evaluation of creative activity of employees in relation to quality assurance of education at UNIZA

https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-220-en.pdf

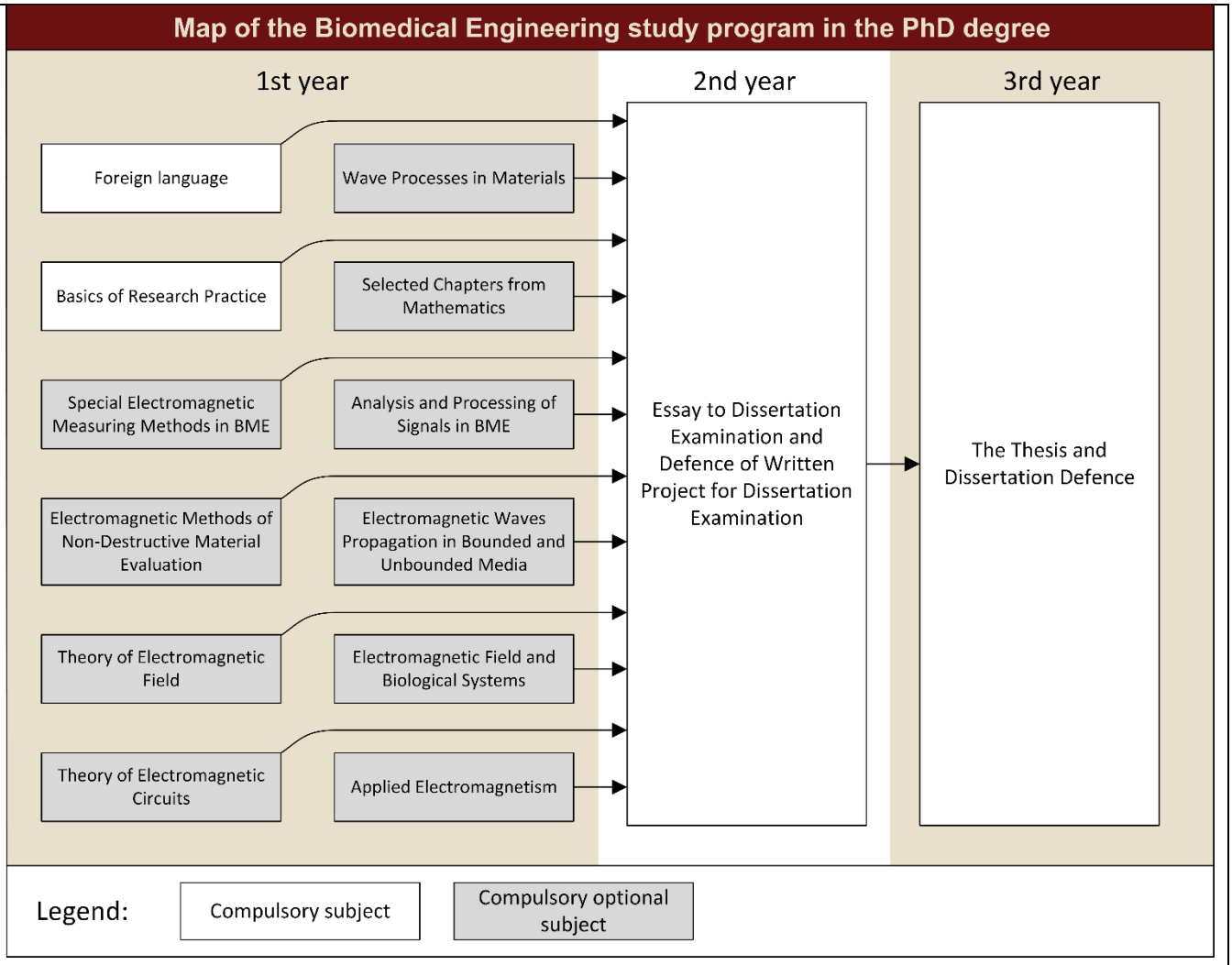
The University of Žilina in Žilina issues this directive on the creative activities of employees in the relationship to ensure the quality of education at the University of Žilina in Žilina (hereinafter referred to as "UNIZA") according to § 15 of Act no. 131/2002 Coll. on universities and on amendments to certain laws in as amended (hereinafter referred to as the "Higher Education Act"), according to Act no. 269/2018 Coll. About ensuring the quality of higher education and amending Act no. 343/2015 Z. z. on public procurement and on the amendment of certain laws as amended later regulations (hereinafter referred to as the "Act on Ensuring the Quality of Higher Education"), acc Decree of the Ministry of Education, Science, Research and Sports of the Slovak Republic No. 397/2020 Coll. about the central register of publication activity records and the central register of artistic records activities (hereinafter referred to as the "decree on the central register"), according to the Internal System Standards of quality assurance, Standards for the study program, Standards for the habilitation procedure and inaugural proceedings and Methodologies for evaluating standards issued by Slovakia by the accreditation agency for higher education. Provisions were also applied during the creation of the directive UNIZA Directive No. 205 Rules for assigning teachers to provide study allowances programs at the University of Žilina in Žilina and UNIZA Methodological Guidelines no. 6/2020 Evaluation of the comprehensive work performance of UNIZA employees.

Directive no. 221 - Cooperation of UNIZA with external partners from practice

https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-221-en.pdf

The subject of this directive is the definition of authority, scope, responsibility, and determination rules for the involvement of external partners from practice in UNIZA activities related to VSK UNIZA as well as with UNIZA's overall approach and rules for cooperation with external partners. External ones practical partners can be international organizations or their representatives, national ones organizations and institutions, state bodies or local self-government bodies, interest associations, associations, chambers, unions as well as representatives of employers' associations, employers, or other experts from practice in the field of activity of UNIZA. External partners from practice are external interested persons (hereinafter referred to as "partners"), which also includes the authority from practice defined in Article 23 Directive no. 214 Structures of the internal quality assurance system for creating, modification, approval and cancellation of study programs at the University of Žilina in Žilina (hereinafter referred to as "Directive no. 214"), which participate in ensuring the quality of higher education and on related activities in the form established by this directive and subsequent internal ones by UNIZA legal regulations. The authority from practice has a separate external interested party position, due to its main subject of activity or professional focus, is independent organization and its main task is to objectively and independently comment on the creation, modification, canceling and harmonizing study programs with SAAVŠ standards based on UNIZA's request or its parts in the form of a statement (opinion): a) on proposals for harmonizing existing ones accredited study programs with SAAVŠ standards for the internal system ensuring the quality of higher education and SAAVŠ standards for the study program, b) to the need to create a new

	study program (to the initiative), c) to the intention to create of a new study program, d) to the proposal to create a new study program, e) to the proposal to adjust the study program, f) to the initiative to cancel the study program, g) to others matters related to ensuring the quality of education at UNIZA based on the requirements of UNIZA or its part, as well as the overall conceptual direction of the individual study programs. **Directive no. 222 - Internal quality assurance system at UNIZA** https://www.uniza.sk/images/pdf/kvalita/EN/smernica-UNIZA-c-222-en.pdf This document is issued as an internal regulation of the University of Žilina in Žilina in accordance with the provisions of § 15 paragraph 1 letter b) Act No. 131/2002 Coll. on universities and on change a amendments to certain laws as amended (hereinafter referred to as "the Higher Education Act") and in accordance with the provisions of § 3 par. 2 letters b) Act no. 269/2018 Coll. on quality assurance of higher education and on amendments to Act no. 343/2015 Coll. about public procurement and on the amendment of certain laws as amended (hereinafter referred to as "the law on ensuring the quality of higher education"). Statute of the Accreditation Council of Žilina of the University of Žilina is an internal regulation of the University of Žilina in Žilina (hereinafter referred to as "UNIZA"), which is part of the internal quality assurance system at UNIZA (hereinafter referred to as "VSK UNIZA"). With this document introduces a complex internal system at the University of Žilina in Žilina quality assurance, regarding the fulfilment of UNIZA's mission and objectives and achievement compliance of VSK UNIZA with SAAVŠ standards. From a methodological point of view, when creating a study program, UNIZA recommends applying the principles and procedures of the constructivist approach, which are described in the methodological guidelines - Principles and recommendations for creating study programs.
b	**Recommended study plans for individual study paths**



c, e	**The study programme, in the structure of compulsory, compulsory optional and optional courses Profile courses of the relevant study path (specialization) within the study programme**
	Appendix 1
d	**Number of credits, the achievement of which is a condition for proper completion of studies**
	180
	Other requirements that the student must meet within the study programme and for its proper completion, including the requirements for state examinations, rules for re-study and rules for the extension, interruption of study
	Conditions that the student must fulfil during study, completion of individual parts of the study program, the student's progress in the study program, repetition, extension and on proper completion of studies is determined by: **Directive no. 110: Study schedule for the third-degree university studies at UNIZA**: https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/2022/27042022_S-110-2013-Studijny-poriadok-pre-3-stupen-VS-UNIZA-v-zneni-Dodatkov-1-az-4.pdf **Directive no. 216 – Ensuring the quality of doctoral studies at the University of Žilina in Žilina:** https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-216.pdf **Guide to doctoral studies**: https://feit.uniza.sk/wp-content/uploads/2021/04/TE.pdf The organization and administrative provision of the third degree of study at FEIT UNIZA is defined in **Dean's Decision no. 1/2021**:

https://feit.uniza.sk/wp-content/uploads/2021/02/Dean's Decision-_1_2021-1.pdf.

Doctoral studies take place according to individual study plans, while a set of knowledge, abilities and skills are subordinated to the specific topic of the dissertation thesis. The supervisor compiles the individual study plan in cooperation with the doctoral student according to the needs of the dissertation thesis and submits it for approval by the chairperson of the working group Biomedical engineering of the subject. commission Electrical engineering, which is established according to the internal regulation of the university. Individual study plan consists of a study part and a scientific part, each of which is assigned an appropriate number of credits and from the pedagogical part.
The study part represents fifty credits from the scope of the study plan. It focuses on getting of deep theoretical knowledge in the field with an emphasis on multidisciplinary field and the acquisition of a methodological apparatus supported by knowledge of selected mathematical-physical and professional disciplines. It consists of a study of two compulsory and two optional subjects and from the compulsory subject Essay to Dissertation Examination and Defence of Written Project for Dissertation Examination. These are compulsory subjects: Basics of Research Practice and Foreign language. The choice of two compulsory optional subjects depends on the topic of the dissertation thesis. Each subject of the study part is assigned ten credits. All subjects of the study part are subjects of the state exam.
The scientific part represents at least 130 credits from the scope of the study plan. It is implemented in Dissertation projects I to IV and individual and team scientific and research work, including the preparation and defence of a dissertation thesis. Dissertation projects I-IV represent complete parts (stages) of the dissertation thesis and each one is assigned ten credits. Assessed activities within individual and team scientific work are publications in journals and conference proceedings, chapters in monographs/university textbooks, protection of intellectual property (patent, utility model), citations registered in the SCI citation index and active presentation of results at conferences. Allocation of credits for individual activities within the framework of individual and team scientific work are determined by the relevant regulations, which are listed above. The study is completed by the dissertation thesis defence that is the state exam. The completion of the PhD. thesis and its successful defence is awarded by 30 credits.
Among the obligations of full-time post gradual students, which result from the Act on Universities and amendment of laws no. 131/2002. From the law there is also pedagogical activity.

Specific conditions during study: interim and final assessment of individual subjects with the weight specified in the information sheets of the subjects, fulfilment of the condition of the minimum number of credits for promotion to a higher year of study in the sense of the above-mentioned regulations.
The basic part of the study is the year in which the student must obtain an average of sixty credits.
Full-time study is divided into school years as follows:
First year - the student receives at least forty credits,
Second year - the student receives at least sixty credits (or a total of one hundred credits for the 1st and the 2nd year),
Third year - the student receives enough credits to reach at least 180 credits during the study.
The condition for progressing to the next part of the study is obtaining the prescribed number of credits in the given year of study. In case of failure to fulfil this obligation, the student will be expelled from the studies. The recommended study plan is compiled in such a way that the student fulfils the conditions by completing it within the standard length of study.

Specific conditions for proper graduation: successful completion of two exams compulsory subjects - Foreign language and Basics of Research Practice and two compulsory elective subjects; preparation and successful defence of the written part of the dissertation exam; elaboration and successful defence of dissertation projects I to IV; individual and team scientific work; pedagogical activities; preparation and successful defence of the dissertation thesis. Number of credits required for proper completion of studies: 180.

Rules for extending studies: according to the Act on Universities and Amendments laws no. 131/2002 Z.z.

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For individual study plans, the institution states the requirements for completing the individual parts of the study programme and the student's progress within the study programme in the given structure

	Proper completion of studies	Part of studies			
		1Y	2Y	3Y	4Y

	number of credits for compulsory courses required for proper completion of studies/completion of a part of studies	60	20	10	30	0
	number of credits for compulsory optional courses required for the proper completion of studies/completion of a part of studies,	20	20	0	0	0
	number of credits for optional courses required for the proper completion of studies/completion of a part of studies	0	0	0	0	0
	number of credits required for the completion of studies/completion of a part of the studies for the common foundations and for the relevant specialization, in the case of a teaching combination study programme or a translation combination study programme	0	0	0	0	0
	number of credits for the final thesis and the defence of the final thesis required for the proper completion of studies	30	0	0	30	0
	number of credits for professional practice required for the proper completion of studies/completion of a part of studies	0	0	0	0	0
	number of credits required for the proper completion of studies/completion of a part of the studies for project work with the indication of relevant courses in engineering study programmes	100	20	50	30	0
	number of credits required for the proper completion of studies/completion of a part of the studies for artistic performances in addition to the final thesis in art study programmes	0	0	0	0	0
	Rules for the verification of learning outcomes, students' assessment and the possibilities of appealing against the assessment					
	The rules for the verification of educational outcomes determine: **Directive no. 110: Study schedule for the third degree of university studies at UNIZA:** https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/10122020_S-110-2013-Studijny-poriadok-PhD-v-zneni-D1-a-D3.pdf **Directive no. 216 Quality assurance of doctoral studies at UNIZA:** https://www.uniza.sk/images/pdf/kvalita/2021/smernicaUNIZA-c-216.pdf **Guide to doctoral studies**: https://feit.uniza.sk/doktorandske-studium-sprievodca/ At the level of individual subjects for the verification of the overall educational outcomes, they are listed in individual ILPs. For the evaluation of students and the possibility of corrective procedures, the procedure according to **Directive no. 110: Study regulations for the third degree of university studies at UNIZA:** https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/10122020_S-110-2013- Studijny-poriadok-PhD-v-zneni-D1-a-D3.pdf					
f	**Conditions for the recognition of studies or a part of studies**					
	At the university level, processes, procedures, and structures are defined by **Directive no. 110: Study regulations for the third degree of university studies at UNIZA:** https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/10122020_S-110-2013- Studijny-poriadok-PhD-v-zneni-D1-a-D3.pdf					

	In the case of foreign mobilities and internships, the processes, procedures, and structures of the study recognition conditions are defined by **Directive 219 – Mobility of students and employees of University of Žilina abroad:** https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-219.pdf.
g	**Topics of final theses of the study programme (or a link to the list)**
	No final theses have been carried out in the last six academic years.
h ; 7.e-f	**Rules for the assignment, processing, opposition, defence and evaluation of final theses in the study programme; list of the supervisors of final theses with the assignment to topics (indicating the contact details)**
	At the university level, processes, procedures and structures are defined by **Directive 215 - Directive on final, rigorous and habilitation theses under the conditions of the University of Žilina in Žilina**: https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-215.pdf. The organization and administrative provision of the third degree of study at FEIT UNIZA is defined in **Dean's Decision no. 1/2021:** https://feit.uniza.sk/wp-content/uploads/2021/02/Dean's Decision-_1_2021-1.pdf
i	**Opportunities and procedures for participation in student mobility**
	At the university level, **Directive no 219 – Mobility of students and employees of University of Žilina abroad:** https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-219.pdf. At the faculty level, specific procedures, and up-to-date information on website: https://feit.uniza.sk/studenti/mobilita-erasmus-2/ At the faculty level, the coordinators and contact persons are: doc. PaeDr. Peter Hockicko, PhD. (Authorised person for international mobility and foreign cooperation), peter.hockicko@uniza.sk Mgr. Silvia Pirníková, (faculty Erasmus coordinator), silvia.pirnikova@uniza.sk
	Rules for adherence to academic ethics and rules for drawing consequences
	At the university level, it defines processes, procedures, and structures **Directive no 207 – Code of Ethics of the University of Žilina in Žilina (**link: Directive-c-207.pdf) and **Directive no 201 – Disciplinary rules for students at the University of Žilina in Žilina** (link: Directive-c-201.pdf). A disciplinary commission is established at the faculty level.
	Procedures applicable to students with special needs
	Directive no 198 – Support defines processes, procedures, and structures at the university level of study applicants and students with specific needs at the University of Žilina in Žilina (Link: https://www.uniza.sk/images/pdf/specificke-potreby/2021/10082021_Smernica-c-198-Podpora-uchadzacov-o-studium-a-SSP-na-Zilinskej-univerzite-v-Ziline.pdf) Detailed information for students can be found on the website: https://www.uniza.sk/index.php/studenti/vseobne-informacie/studenti-so-specifickymipotrebami At the faculty level, the coordinators and contact persons are: doc. Ing. Mariana Beňová, PhD. (Dean for education), mariana.benova@uniza.sk B.Sc. Emília Pekárová, (referent for education), emilia.pekarova@uniza.sk
	Procedures for filing complaints and appeals by students
	At the university level, processes, procedures, and structures are defined by **Directive no. 110: Study regulations for the third degree of university studies at UNIZA:** https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/10122020_S-110-2013-Studijny-poriadok-PhD-v-zneni-D1-a-D3.pdf At the faculty level through published e-mail contacts of responsible persons, through students represented in the student section of the Academic Senate of FEIT and via the link We will advise you: https://feit.uniza.sk/studenti/poradime-vam/ or Link for the dean: https://odkaz.feit.uniza.sk/

5. Course information sheets of the study programme (*In the structure according to Decree no. 614/2002 Coll)*

Subject	Abbreviation	Pobor.	Range	Finish.	Credits	Profile.	Core	Guerantee
1st year **summer semester**								
3D0EEE1 Basics of Research Practice	ZVP	Comp.	2 - 0 - 0	T	10.0	-	yes	prof. Ing. Pavol Špánik, PhD.
3D0FE12 Foreign language	SvJ	Comp.	2 - 0 - 0	T	10.0	-	-	prof. Ing. Ladislav Janoušek, PhD.
3D00E01 Selected Chapters from Mathematics	VSM	Comp. elective	2 - 0 - 0	T	10.0	-	yes	doc. Mgr. Branislav Ftorek, PhD.
3D0FE03 Analysis and Processing of Signals in BME	ASSBMI	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	doc. Ing. Branko Babušiak, PhD.
3D0FE04 Applied Electromagnetism	AEM	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	prof. Ing. Milan Smetana, PhD.
3D0FE05 Electromagnetic Methods of Non-Destructive Material Evaluation	EMNVM	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	prof. Ing. Milan Smetana, PhD.
3D0FE06 Electromagnetic Field and Biological Systems	EMPBS	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	prof. Ing. Ladislav Janoušek, PhD.
3D0FE07 Electromagnetic Waves Propagation in Bounded and Unbounded Media	SEMVP	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	doc. Ing. Štefan Borik, PhD.
3D0FE08 Special Electromagnetic Measuring Methods in BME	SEMBMI	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	prof. Ing. Milan Smetana, PhD.
3D0FE09 Theory of Electromagnetic Circuits	TEO	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	doc. Ing. Mariana Beňová, PhD.
3D0FE10 Theory of Electromagnetic Field	TEM	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	prof. Ing. Ladislav Janoušek, PhD.
3D0FE11 Wave Processes in Materials	VPL	Comp. elective	0 - 2 - 0	T	10.0	yes	yes	doc. Ing. Štefan Borik, PhD.
3D00E05 university pedagogy	UP	Selective	0 - 2 - 0	S	2.0	-	-	Mgr. Jana Trabalíková, PhD.
Subject	**Abbreviation**	**Pobor.**	**Range**	**Finish.**	**Credits**	**Profile.**	**Core**	**Guerantee**
2nd year								
summer semester								

	3D0FE01 Essay to Dissertation Examination and Defence of Written Project for Dissertation Examination	DS	Comp.	0 - 0 - 0	T	10.0	yes	yes	prof. Ing. Ladislav Janoušek, PhD.
	Subject	**Abbreviation**	**Pobor.**	**Range**	**Finish.**	**Credits**	**Profile.**	**Core**	**Guerantee**
	3rd year								
	summer semester								
	3D0FE02 The Thesis and Dissertation Defence	DP	Comp.	0 - 0 - 0	T	30.0	yes	yes	prof. Ing. Ladislav Janoušek, PhD.

6.	**Current academic year plan and current schedule**	
	Current academic year plan	https://feit.uniza.sk/studenti/doktorandske-studium/
	Current schedule	There is no fixed schedule for doctoral students, studies are based on project learning and individual consultations.

7.	**Persons responsible for the study programme**			
a	**A person responsible for the delivery, development, and quality of the study programme (indicating the position and contact details**			
	Name and surname: Ladislav Janoušek, prof. Ing., PhD. Position: head of the Department of Electromagnetic and Biomedical Engineering Contact (mail, tel.): ladislav.janousek@uniza.sk; 041/513 2100			
b – c	**List of persons responsible for the profile courses of the study programme**			
	Name, Surname, titles on the position of the associated professor or professor	Profile course name		Additional information
	doc. Ing. Branko Babušiak, PhD.	Analysis and Processing of Signals in BME		
	doc. Ing. Mariana Beňová, PhD.	Theory of Electromagnetic Circuits		
	doc. Ing. Štefan Borik, PhD.	Electromagnetic Waves Propagation in Bounded and Unbounded Media		
	doc. Ing. Štefan Borik, PhD.	Wave Processes in Materials		
	prof. Ing. Ladislav Janoušek, PhD.	Electromagnetic Field and Biological Systems		
	prof. Ing. Ladislav Janoušek, PhD.	Theory of Electromagnetic Field		
	prof. Ing. Milan Smetana, PhD.	Applied Electromagnetism		
	prof. Ing. Milan Smetana, PhD.	Electromagnetic Methods of Non-Destructive Material Evaluation		
	prof. Ing. Milan Smetana, PhD.	Special Electromagnetic Measuring Methods in BME		
d	**List of teachers of the study programme (including doctoral students) with the assignment to the course**			
	Name, Surname and titles	Profile course name	Organizational form provided by teacher	Additional information
	doc. Ing. Branko Babušiak, PhD.	Analysis and Processing of Signals in BME	seminars	

	doc. Ing. Branko Babušiak, PhD.	Foreign language	lectures	
	doc. Ing. Mariana Beňová, PhD.	Electromagnetic Field and Biological Systems	seminars	
	doc. Ing. Mariana Beňová, PhD.	Theory of Electromagnetic Circuits	seminars	
	doc. Ing. Mariana Beňová, PhD.	Foreign language	lectures	
	doc. Ing. Štefan Borik, PhD.	Analysis and Processing of Signals in BME	seminars	
	doc. Ing. Štefan Borik, PhD.	Applied Electromagnetism	seminars	
	doc. Ing. Štefan Borik, PhD.	Electromagnetic Field and Biological Systems	seminars	
	doc. Ing. Štefan Borik, PhD.	Electromagnetic Waves Propagation in Bounded and Unbounded Media	seminars	
	doc. Ing. Štefan Borik, PhD.	Special Electromagnetic Measuring Methods in BME	seminars	
	doc. Ing. Štefan Borik, PhD.	Theory of Electromagnetic Field	seminars	
	doc. Ing. Štefan Borik, PhD.	Wave Processes in Materials	seminars	
	doc. Ing. Štefan Borik, PhD.	Foreign language	lectures	
	prof. Ing. Michal Frivaldský, PhD.	Basics of Research Practice	lectures	
	doc. Mgr. Branislav Ftorek, PhD.	Selected Chapters from Mathematics	lectures	
	Mgr. Gabriela Chalupianská	university pedagogy	seminars	
	prof. Ing. Ladislav Janoušek, PhD.	Basics of Research Practice	lectures	
	prof. Ing. Ladislav Janoušek, PhD.	Electromagnetic Methods of Non-Destructive Material Evaluation	seminars	
	prof. Ing. Ladislav Janoušek, PhD.	Electromagnetic Field and Biological Systems	seminars	
	prof. Ing. Ladislav Janoušek, PhD.	Electromagnetic Waves Propagation in Bounded and Unbounded Media	seminars	
	prof. Ing. Ladislav Janoušek, PhD.	Theory of Electromagnetic Circuits	seminars	
	prof. Ing. Ladislav Janoušek, PhD.	Theory of Electromagnetic Field	seminars	
	prof. Ing. Ladislav Janoušek, PhD.	Foreign language	lectures	
	PaedDr. Lenka Môcová, PhD.	university pedagogy	seminars	
	prof. Ing. Dušan Pudiš, PhD.	Basics of Research Practice	lectures	
	prof. Ing. Milan Smetana, PhD.	Applied Electromagnetism	seminars	
	prof. Ing. Milan Smetana, PhD.	Electromagnetic Methods of Non-Destructive Material Evaluation	seminars	
	prof. Ing. Milan Smetana, PhD.	Electromagnetic Field and Biological Systems	seminars	

	prof. Ing. Milan Smetana, PhD.	Electromagnetic Waves Propagation in Bounded and Unbounded Media	seminars	
	prof. Ing. Milan Smetana, PhD.	Special Electromagnetic Measuring Methods in BME	seminars	
	prof. Ing. Milan Smetana, PhD.	Theory of Electromagnetic Circuits	seminars	
	prof. Ing. Milan Smetana, PhD.	Theory of Electromagnetic Field	seminars	
	prof. Ing. Milan Smetana, PhD.	Wave Processes in Materials	seminars	
	prof. Ing. Milan Smetana, PhD.	Foreign language	lectures	
	prof. Ing. Pavol Špánik, PhD.	Basics of Research Practice	lectures	
	Mgr. Jana Trabalíková, PhD.	university pedagogy	seminars	

g	**Student representatives representing the interests of students of the study programme**	
	Name, Surname and titles	Contact details
	Ing. Ľudmila Králiková	Mail: *ludmila.kralikova@feit.uniza.sk*
h	**Study advisor of the study programme**	
	Name and surname: prof. Ing. Ladislav Janoušek, PhD. E - mail: ladislav.janousek@uniza.sk Phone: 041/513 2100	
i	**Other supporting staff of the study programme – assigned study officer, career counsellor, administration, accommodation department, etc.**	
	Name and surname: doc. Ing. Mariana Beňová, PhD. Area of responsibilities / Competencies: vice dean for education Phone.: +421 41 513 2119 E-mail: mariana.benova@uniza.sk Name and surname: Bc.Viera Beláková a Bc. Emília Pekarová Area of responsibilities/Competences: Department for education, study agenda. Phone.: +421 41 513 2064, 2063 E-mail: studref@feit.uniza.sk	

8. Spatial, material, and technical provision of the study programme and support

a **List and characteristics of the study programme classrooms and their technical equipment with the assignment to learning outcomes and courses** (laboratories, design and art studios, studios, workshops, interpreting booths, clinics, priest seminaries, science and technology parks, technology incubators, school enterprises, practice centres, training schools, classroom-training facilities, sports halls, swimming pools, sports grounds).

The Department of Electromagnetic and Biomedical Engineering FEIT UNIZA has modern laboratories built for the purpose of specialized teaching and scientific research activities in the biomedical engineering with a unique research infrastructure.

Designation of the Laboratory	Description	Subjects
AB 306 ***Laboratory of Information Systems and Medical Data Processing (MedSoft Lab)***	*The laboratory provides a basis for study and scientific research in the field of technical and informational support of electrical engineering and biomedicine. The equipment of the biomedical engineering laboratory with professional measuring sets Biopac MP36 allows measuring a wide range of vital manifestations of the human organism with subsequent analysis and evaluation of the measured signals. Furthermore, the laboratory has FLUKE Prosim 2*	*The laboratory is used for teaching subjects:* **Analysis and Processing of Signals in BME** **Special Electromagnetic Measuring Methods in BME** **Applied Electromagnetism** **Electromagnetic Field and Biological Systems** **Electromagnetic Waves Propagation in Bounded and Unbounded Media**

		patient simulators, which are used to generate test biological signals, which are used to verify the correct function and calibrate designed or commercially available diagnostic devices. Furthermore, the laboratory has programmers and development boards for microcontrollers from the AVR family. The laboratory of biomedical engineering also serves as a teaching classroom equipped with computers with software resources necessary to provide all subjects within the provided study program that require software tools to solve the problems of the given subject. The main software tools used in the laboratory include the programming language MATLAB and MATLAB SIMULINK with specialized toolboxes (Signal Processing Toolbox, Image processing Toolbox and Neural network toolbox), as well as CST Studio Suite, Microchip Studio and NetBeans. Doctoral students of the department work in this laboratory as part of their studies to prepare their doctoral theses, as well as bachelor's and engineering degree students of the Biomedical Engineering study program to prepare semester, bachelor's and diploma theses. *Laboratory head: Ing. Michal Gála, PhD.*	*The laboratory is also used for individual project and scientific research work of doctoral students.*
	AB314 ***Medical Electronics and 3D Printing Development Laboratory (MedVeT Lab)***	*The electronics laboratory is used for experimental work by employees, doctoral students and students finishing their bachelor's and engineering studies. The main focus of the laboratory is in the field of design, development and testing of electronic devices. The development is mainly focused on medical diagnostic devices and sensor systems for biomedical applications. Considering the purpose of the laboratory, the laboratory is equipped with soldering stations, oscilloscopes, laboratory sources, a signal generator and multimeters. The laboratory also includes 3D printer a XYZprinting da Vinci Super employed primarily for printing specific packaging and cases for electronic devices and sensors being developed.* *Laboratory head: doc. Ing. Branko Babušiak, PhD.*	*The laboratory is used for teaching subjects:* **Analysis and Processing of Signals in BME** **Special Electromagnetic Measuring Methods in BME** **Electromagnetic Waves Propagation in Bounded and Unbounded Media** **Theory of Electric Circuits** *The laboratory is also used for individual project and scientific research work of doctoral students.*
	AFs08b ***Electromagnetic Biocompatibility Laboratory (EMCare Lab)***	*The laboratory is specialized in researching the effects of low-frequency electromagnetic fields on microbiological systems. As part of this research task, inoculation and cultivation of microbiological samples, irradiation of samples and microscopic counting of cells using Burker counting chambers are carried out. Furthermore, the laboratory monitors the bio-electrodynamic properties of cells using patch-clamp techniques.* *Its specialized instrumentation also corresponds to the laboratory's research focus: Q-cell incubator, ESCO PCR box, Hubert A1110-16 broadband excitation signal amplifier, Taitec OD evaluation system optical density evaluation system, digital multimeters, signal generator and complex electrophysiological equipment measurements (Faraday cage, TMC Air table 900 x 1200 mm, inverted microscope with ZEISS Primo Vert camera, automated system for measuring electrophysiological properties of cells ChannelMAX 100A Mini, micromanipulator, Sutter Instruments P-30*	*The laboratory is used for teaching subjects:* **Special Electromagnetic Measuring Methods in BME, Applied Electromagnetism, Electromagnetic Field and Biological Systems.** *The laboratory is also used for individual project and scientific research work of doctoral students.*

		vertical micropipette puller and other laboratory equipment). *Laboratory head: Ing. Roman Radil, PhD.*	
	AFs08a ***Laboratory of Non-Invasive Cardiovascular Diagnostics (HemodynamiX Lab)***	*The Laboratory of Non-Invasive Cardiovascular Diagnostics is focused on the use of visible, near-infrared and infrared spectrum of electromagnetic radiation for the investigation of changes in hemodynamic parameters, while the laboratory focuses on multi-modality sensing of cardiovascular functions of the human body. Unique instrumentation includes state-of-the-art camera systems for photoplethysmography imaging, modular infrared cameras, machine vision cameras, cameras with implemented artificial intelligence algorithms, innovative equipment enabling the detection of hemodynamic changes through magnetic induction, multi-channel EMG, multi-wavelength lighting system. The laboratory is used for scientific research purposes by the employees of the department, doctoral students, but also students of the bachelor's and master's degree programs of the Biomedical Engineering program as part of the implementation of their final theses and also within the subject of applied optoelectronics.* *Head of the laboratory: doc. Ing. Štefan Borik, PhD.*	*The laboratory is used for teaching subjects:* **Special Electromagnetic Measuring Methods in BME, Applied Electromagnetism, Electromagnetic Field and Biological Systems, Electromagnetic Waves Propagation in Bounded and Unbounded Media**. *The laboratory is also used for individual project and scientific research work of doctoral students.*
	BD111 ***Non-Destructive Investigation Laboratory (DEFECTO Lab)***	*The laboratory provides a platform for study and scientific research in the field of the electromagnetic field and electromagnetic phenomena. Scientific and research activity is primarily focused on the issue of electromagnetic methods of non-destructive investigation of conductive materials, mainly on the eddy current method. The laboratory is equipped with instrumentation designed for the generation, filtering and processing of useful signals, for the use of various measurement methods. These are mainly signal generators using digital signal synthesis, broadband power analog amplifiers, a filter element based on digital signal filtering - the so-called lock-in amplifier, three-axis controlled positioning system and the necessary computing technology, together with suitable software and measurement cards for data acquisition. Furthermore, it is also equipped with special commercial measuring devices for the implementation of the eddy current method in laboratory conditions and also in the field: these are stationary and portable measuring devices with accessories: various measuring probes, intended mainly for the eddy current method and other specialized measurements. The laboratory is also used by the department's employees when solving other scientific and research tasks. Numerical simulations and some measurements of EMF effects on the human body are also carried out in the laboratory. Doctoral students of the department work in the laboratory as part of their studies and when preparing doctoral theses. The laboratory also serves bachelor's and engineering degree students in solving tasks associated with bachelor's and diploma theses, as well as bachelor's and diploma projects.* *Laboratory head: prof. Ing. Milan Smetana, PhD.*	*The laboratory is used for teaching subjects:* **Special Electromagnetic Measuring Methods in BME, Applied Electromagnetism, Electromagnetic Methods of Non-Destructive Material Evaluation.** *The laboratory is also used for individual project and scientific research work of doctoral students.*

b	**Characteristics of the study programme information management** (access to study literature according to Course information sheets, access to information databases and other information sources, information technologies, etc.)
	At the university level, the processes, procedures and structures are defined by Directive 218 on the collection, processing, analysis and evaluation of information to support the management of study programmes. The basic information system supporting the process of education and teaching at the University of Žilina (ŽU) is the Academic Information and Education System (AIVS). AIVS is available to students from the university domain and from the Internet, while the university's WiFi network supports EDUROAM. Currently, AIVS services cover the entire life cycle of a student of a study program, from the submission of the application to the final exam and activities related to the completion of studies at the university. AIVS supports the management of the study agenda at faculties and other parts of the university at all levels, forms and types of higher education. Within each study programme, it is used to register applicants, students and graduates, to monitor study results, to support the credit system of study in accordance with Section 62 of Act 131/2002 Coll., to support the creation of timetables, etc. It supports the generation of ECTS information packets (Section 20(1)(e)), activities related to the completion of studies (certificates, diplomas), as well as the processing of diploma supplements (Section 68(1)(c)). AIVS consists of several subsystems: a) Subsystem "Admission Procedure" – enables the processing of the application (electronic and classic), results and their evaluation, communication with the applicant (invitations, announcements and statements), processing of statistics for the Ministry of Education. (b) Training subsystem — consisting of modules: - student register, - study administration (study programmes, study plans, course information sheets), - enrolment in studies, - processing of the teaching schedule and management of resources (classrooms, technical equipment), - administration of exams (announcing exam dates, registering for exams), - course of study - records of study results, continuous evaluation of study results (Internal Directive No. 100 Rules for Continuous Evaluation of the Quality of Education Provided at the University of Žilina), - study stays (mobilities) - the data are part of the student register and are exported to the central student register c) "Completion of studies" subsystem – consists of modules "final theses" and "state examinations". The "Theses" module is aimed at supporting the following activities: - assignment of topics for final theses by the department or teacher, - selection of the topic of the final thesis by the student, - approval and confirmation of topics and students by the department, - export of basic data from AIVS to the local repository of the information system of final theses - EZAP (internal directive No. 103 on final theses), - handing over the finished work to EZAP at UNIZA, - import of work status and compliance protocol data from EZAP. The "State Examinations" module allows: - compilation of state examination committees by the department, - definition of state exam subjects, - enrolment in state exam subjects - graduating students, - division of students by days and commissions, - Entry of exam results for individual state exam subjects, record of the evaluation of the final thesis, on-line printing of the State Examination Record (to be signed by the State Examination Board), - Diploma printing - carried out in study departments. The internal UNIZA Directive No. 87 applies to the preparation of the thesis, its submission to EZAP and subsequent steps. The "UniApps" application allows you to access AIVS data and services from mobile devices with Android OS, in accordance with the university's concept of introducing mobile technologies. The university encourages students to use their own mobile devices. UniApps provides access to information for full-time students at the 1st and 2nd level. The following functionalities are currently available: -schedule - User profile, - exam dates, - registering for exams,

	- test results. E-learning: At the university, e-Learning is built on the basis of LMS Moodle. The organization of the courses is based on guided study with the support of information and communication technologies in close connection with the Academic Education and Information System (AIVS). E-learning has been used at the university since the academic year 2004/2005. The study programme is also significantly supported by its own information system in the form of departmental websites, where students can find all the necessary information necessary for their studies. These sites allow electronic registration for semester papers, bachelor's and master's theses. The architecture of the website allows all teachers providing education of the study programme to provide students with relevant information in the form of publication on the website of each subject individually. The information system of individual courses allows access to semester or year assignments, lectures, requirements for successful completion of the course as well as topics of questions for the exam. At the faculty level, students of the study program have free access to many scientific and technical databases containing scientific papers and electronic versions of books and teaching texts (STN online, Web of Science, ScienceDirect, SCOPUS, IEEE Xplore, Springer, Springer Link, Wiley) free of charge. Students have access to another large collection of study literature through the University Library (http://ukzu.uniza.sk), either in the form of a loan or literature study in the comfortable premises of the library. An integral part is also the KTEBI sub-library, which contains specific professional books defined in the ILP as study literature. In addition, the library provides a wide range of electronic services in the e-resources (http://ukzu.uniza.sk/e-booky/) section. The EDIS publishing house provides printing of final theses. In terms of information security, the Biomedical Engineering study program is at a high level. First of all, all lectures (academic year 2020/2021) taught by the department as part of the Biomedical Engineering study program are recorded in the form of videos, which are made available to students using the MS TEAMS environment. This provides students with the opportunity to look at the issue again, whether as preparation for an exercise or for an exam. The TEAMS system is also used to make study literature available, either in the form of links or by directly saving the electronic version of the resource.
c	**Characteristics and extent of distance education applied in the study programme with the assignment to courses. Access, manuals of e-learning portals. Procedures for the transition from contact teaching to distance learning.**
	Doctoral studies are carried out on an individual basis.
d	**Institution partners in providing educational activities for the study programme and the characteristics of their participation.**
	Partners: Siemens Healthiners, s.r.o., Žilina Hospital and Polyclinic, Jessenius Faculty of Medicine in Martin, Comenius University in Bratislava, Institute of Measurement Science of the Slovak Academy of Sciences VUJE, a.s., Trnava VUTCH-CHEMITEX, s.r.o., Žilina. Characteristics of participation: cooperation in scientific research activities, professional lectures, opportunities for professional practice and internships, etc.
e	**Characteristics of the possibilities for social, sports, cultural, spiritual and social activities**
	At the university level, possibilities for social, sports, cultural, spiritual and social enjoyment are described in Directive No. 217 – Resources for the support of educational, creative and other related activities of the University of Žilina in Žilina, especially articles 17, 18 and 19: https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-217.pdf Initial and summary information about all the basic facts necessary for a full-fledged academic life is provided to students in the form of an information guide (distributed both in paper and electronically).

	At UNIZA, students have the opportunity to participate in a variety of interest or self-governing organizations - Gama club, Council of accommodation students Veľký Diel, Council of accommodation students Hliny, Internet club, student television í-Téčko, Club of friends of UNIZA railways, boarding radios RAPEŠ and Radio X, Erasmus Student Network (ESN), UNIZA University Club of Firefighters, OMNIA Choir, STAVBÁR Folklore Ensemble, University Pastoral Center at the University of Žilina. Sports activities for students are offered by the Institute of Physical Education - teaching the subject of physical education (23 sports), extracurricular sports activities, outdoor activities (rafting, cycling, skiing, windsurfing,...), organizing university competitions, regeneration (sauna). Several sports grounds are available - FIT-CLUB HLINYV (Fitness center, aerobics hall, squash court, multi-purpose field, regeneration complex, gym for combat sports, climbing wall), FIT-CLUB VELKÝ DIEL (Fitness center, multi-purpose hall, ricochet court , gymnasium T18 Veľký Diel, gymnasium Májová ul., tennis courts, grass football field, athletic track). For those interested in performance sports, sections of the ACADEMIC UNIZA sports club are available. The Institute of Physical Education regularly organizes one-day and multi-day rafting sports courses (Soča, Salza, Váh, Hron, Belá), cycling trips combined with hiking, but also winter skiing courses (Low Tatras, Alps). The university library provides a range of library services (loan services, interlibrary loan services, international loan services, bibliographic and information services, information consulting, COPY center, HandLab, 3D printing and others). EDIS - the UNIZA publishing house, offers the sale of study literature, promotional items, copying services, printing and binding of theses, etc., on the university grounds.. Students get a student card, which entitles them to use several services, such as access system, catering system, external services outside the university (TRANSCARD - mainly bus transport), university library, accommodation facility, LDAP account allowing access to information systems. On the university campus, within which SP is provided, there are two accommodation facilities available - Veľký Diel and Hliny, on the grounds of which sports, cultural, informational and other facilities of interest, associations and clubs and student organizations organized by students or for students operate. Meals - students have the opportunity to use the services offered by the canteen, which provides meals in its 7 centers. Meals can be purchased using a student card (student card). News about life at the university and especially the faculty are provided to the students of the Faculty of Arts through the special web portal FEIT City.
f	**Possibilities and conditions for participation of the study programme students in mobilities and internships, application instructions, rules for recognition of this education**
	At the university level, processes, procedures and structures are defined by Directive 219 – Mobility of students and employees of the University of Žilina in Žilina abroad: https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-219.pdf At the faculty level, detailed information for students is provided on the website: https://feit.uniza.sk/studenti/mobilita-erasmus-2/ contact person: Mgr.Silvia Pirníková, silvia.pirnikova@uniza.sk There is a coordinator at the BMI study program level: contact person: doc. Ing. Štefan Borik, PhD., stefan.borik@uniza.sk

9.	**Required abilities and admission requirements for the study programme applicants**
a	**Required abilities and necessary admission requirements**
	At the university level, it defines the processes, procedures and structures Directive 206 – Principles and rules of the admission procedure for studying at UNIZA: https://akreditacia.uniza.sk/doc/S_206_2021pdf At the faculty level, the Academic Senate of the faculty has approved the Admission Principles and

	Rules, which describe in detail all required skills and prerequisites for admission to individual study programs at FEIT, including the Biomedical Engineering study program, and are available at: https://feit.uniza.sk/studenti/doktorandske-studium/ The application is submitted for a specific study program and the applicant applies for a specific dissertation topic, which are published on the faculty's website. In case of interest in several study programs, it is necessary to submit an application for each study program separately with payment of the relevant fee for the admission procedure. Applicants fill out an electronic application via the FEIT website (http://feit.uniza.sk/ in the Study Applicants section) or the UNIZA website https://vzdelavanie.uniza.sk/prijimacky/index.php. ***Submission of a properly completed application by the specified deadline and payment of the fee for the admission procedure by the specified date are a condition for the applicant's inclusion in the admission procedure.*** The basic condition for admission to study in the third level of higher education at the Faculty of Electrical Engineering and Information Technologies of the University of Žilina in Žilina is the acquisition of a second-level higher education (Act on Higher Education Institutions No. 131/2002 Coll. as amended) in the same or related study program. In the case of a foreign applicant or a student who has completed his studies abroad, he submits to the application for university studies, no later than when enrolling for studies, a decision on the recognition of a document of completion of a second-level university education by the relevant institution in the Slovak Republic, or apply to UNIZA for recognition of the education document.
b	**Admission procedures**
	At the university level, it defines the processes, procedures and structures Directive 206 – Principles and rules of the admission procedure for studying at UNIZA: https://akreditacia.uniza.sk/doc/S_206_2021pdf. At the faculty level, the Academic Senate of the faculty has approved the Admission Principles and Rules, which describe in detail all required skills and prerequisites for admission to individual study programs at FEIT, including the Theoretical Electrical Engineering study program, and are available at: https://feit.uniza.sk/studenti/doktorandske-studium/. Candidates for doctoral studies apply for dissertation topics in the relevant study program, which are listed well in advance and published on the faculty's website: https://feit.uniza.sk/doktorandske-studium-temy/. The selection of applicants will take place in the form of an entrance exam, in which applicants will participate in person. Applicants are invited to the entrance exam in writing with information about its progress. The applicant is obliged to present an identity card during the entrance exam. The entrance exam is conducted orally in the form of a debate. An applicant with specific needs at his request and based on the evaluation of his specific needs in accordance with §100 par. 9 letters b) of the Act on Universities, the dean will determine the form of the entrance exam and the method of conducting it, taking into account his specific needs and in accordance with Directive No. 198 Support for study applicants and students with specific needs at the University of Žilina in Žilina. They are assessed during the entrance exam: a) results of previous studies, b) language maturity, c) previous publication activity of the applicant, d) other activities of the applicant in the given field (ŠVOS, practice, professional internships,...), e) prerequisites for the applicant's independent scientific work in the subject of the study program in the form of a debate on the chosen topic. The language maturity of the applicant and the overview of the applicant in the given field of

focus of the dissertation are evaluated with qualification grade A - excellent to FX - insufficient. If the applicant receives an FX rating in at least one of these evaluated areas - insufficient, then he has failed the entrance exam.
Based on the results from all assessed areas, the admissions committee compiles a ranking of successful applicants, which is recorded in the Minutes of the admissions procedure, which is archived at the study department of the faculty.
The final decision on admission / non-admission to doctoral studies in a given study program is issued by the dean of the faculty based on the results of the admission procedure, taking into account the order determined by the admissions committee and the capacity options of the respective study program.

c **Results of the admission process over the last period**

The number of applicants to the 1st year for the period of the last 6 years:

Academic year	AR19/20	AR20/21	AR21/22	AR22/23	AR23/24	AR24/25
I. year	0	0	0	0	0	0

Of this, the actual number of students enrolled in the 1st grade as of 31.10. of the relevant academic year for the period of the last 6 years:

Academic year	AR19/20	AR20/21	AR21/22	AR22/23	AR23/24	AR24/25
I. year	0	0	0	0	0	0

10. Feedback on the quality of provided education

Procedures for monitoring and evaluating students' opinions on the study programme quality

a

Procedures for monitoring and evaluating students' opinions on the quality of the study program
At the university level, processes, procedures and structures are defined by Directive no. 223 – Monitoring and ongoing evaluation of study programs:
https://www.uniza.sk/images/pdf/kvalita/2021/smernica- UNIZA-c-223.pdf.

The process of monitoring and periodic evaluation of study programs is carried out at UNIZA at three levels:
a) at the level of the Study Program Council;
b) at the level of UNIZA faculties and institutes;
c) at the level of the UNIZA Accreditation Board.
Study program monitoring in UNIZA conditions includes ongoing monitoring and review of the educational process in the relevant study program, implementation of planned activities aimed at improving the quality of education, achieving educational outcomes and goals, compliance with relevant legislation and other legal regulations and guidelines.
They participate in the monitoring and periodic evaluation of the study program:
a) internal interested parties:
   i. UNIZA students through feedback at the level of subjects and at the level of study programs implemented on an annual basis;
   ii. teachers through regular annual evaluation of subjects and feedback mapping their perception of the teaching process on a three-year basis;

b) external interested parties:
   i. UNIZA graduates through feedback mapping their entry into the labor market and adaptation in employment carried out on a three-year basis;
   ii. employers through feedback mapping the readiness of SP graduates for practice carried out on a

	three-year basis. ***Feedback from students:*** 1. Feedback on the admission procedure and the process of adaptation to university studies is obtained through an anonymous questionnaire intended for all first-year students at all levels of study. 2. Feedback on individual subjects is obtained through a regular semester anonymous questionnaire intended for all students of all levels of education. It maps the educational process to the teacher/subject level, the teacher's approach, the possibility of achieving educational outcomes and their connection with teaching and assessment methods, the specifics of the subject. In the case of several teachers providing the subject (e.g. lecture, seminar...), one questionnaire is constructed per subject with a separate assessment of individual teachers. 3. Feedback at the level of the study program is obtained through a regular anonymous questionnaire intended for students in the final years of all levels of education. It serves to map the entire study program, including the content of education, the organization of education and access to counselling and other services during studies. Students who are teachers for Feedback on the admission process and Feedback on individual subjects or professional guarantors of the study program for feedback at the level of the study program are invited to fill out questionnaires. Part of the application form is information on the place of publication of previous results of monitoring and periodic evaluation. The results of the feedback on the education being carried out and the identified opportunities for improvement are subsequently analysed, evaluated and are the basis for the creation of the Study Program Evaluation Report as part of the periodic evaluation of the study program by the Study Program Council. ***Feedback from graduates:*** Feedback from graduates of study programs maps the effect and impact of completed higher education at the relevant level. The anonymous questionnaire is intended for all graduates who completed their studies in the given study program in the last three years. The general set of questions consists of items organized at least into topics: a) Sphere of application; b) Transition to employment; c) Relevance of study in relation to employment, subject composition, comparison of knowledge, skills and competences acquired through study and required by practice; d) The need for further education. Graduates are asked to fill out a questionnaire through the Study Program Council in cooperation with the dean of the faculty. The application includes information on the place of publication of previous results of monitoring and periodic evaluation The guarantor of the study program analyses the data from the received feedback, identifies possibilities and suggestions for strengthening the strengths, eliminating identified weaknesses and possible threats. The results of the feedback on the education provided and the identified opportunities for improvement are subsequently analysed, evaluated by the Study Program Council and are the basis for the creation of the Study Program Evaluation Report as part of the periodic evaluation of the study program by the Study Program Council.
b	**Results of student feedback and related measures to improve the study programme quality**
	Supervisors in the biomedical engineering study program have so far held informal discussions with doctoral students in order to obtain feedback. During the preparation of the annual evaluation of doctoral students, the guarantor of the study program talks individually with each doctoral student in order to obtain targeted feedback on the study plans, individual completed subjects, the teachers of these subjects and other

	observations related to the organization of the study and other activities while preserving the anonymity of the opinions presented. observations, recommendations, critical comments, etc. The following recommendations/conclusions emerged from the meetings held so far and the evaluation of feedback from doctoral students in the theoretical electrical engineering study program: 1. The teaching and evaluation of compulsory optional subjects should be implemented on a project basis with a follow-up to the focus of the dissertation. 2. To formalize education focused on the basic principles of scientific work, for which each supervisor prepares the doctoral student individually. All of the above conclusions were implemented in the curriculum adjustments in 2022 as part of the process of harmonization of the Internal Quality System of the University of Žilina with the standards of the Slovak Accreditation Agency for Higher Education. As part of the questionnaire surveys carried out for the academic years 2022/2023 and 2023/2024, no measures were taken at the level of study programme evaluation.
c	**Results of graduate feedback and related measures to improve the study programme quality.**
	The guarantor and supervisors in the biomedical engineering study program have so far held informal discussions with doctoral graduates on various occasions in order to obtain feedback. No recommendations/conclusions emerged from the discussions with the graduates of the doctoral studies in the biomedical engineering study program.

11.	**References to other relevant internal regulations and information concerning the study or the study programme student** (e.g study guide, accommodation regulations, fee directive, guidelines for student loans, etc.).
Internal regulations and information	**Link**
S 106_2012 Statute of UNIZA as amended by Addenda 1 to 5	https://www.uniza.sk/images/pdf/uradna-tabula/17012019_S-106-2012-Statut-UNIZA-v-zneni-Dodatkov1-az-5.pdf
S 110_2013 Study schedule for the 3rd level of university studies at UNIZA in stamp no. Appendices 1 to 3	https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/10122020_S-110-2013-Studijny-poriadok-PhD-v-zneni-D1-a-D3.pdf
S 132_2015 on free access to information	http://uniza.sk/document/Zasady_SI_ZU_VI-2015.pdf
S 149_2016 Organizational rules as amended by Addenda no. 1 to 17	https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/2021/02092021_S-149-2016-Organizacny-poriadok-UNIZA-D1-az-D16-07062021.pdf
S 152_2017 Principles of UNIZA's editorial activity as amended by the Addendum n.1	SM152-zasady-edicnej-cinnosti-31032020.pdf (uniza.sk)
S 159_2017 Work order	https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/S-159_2017-Pracovn-poriadok_03112017.pdf
S 163_2018 Accommodation rules of accommodation facilities UNIZA	https://www.uniza.sk/images/pdf/ubytovanie/27082018_Ubytovaci-poriadok-od-01092018.pdf
S 167_2018 Rules of procedure of UNIZA disciplinary commissions as amended by Addendum No. 1	https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/2021/09072021_S-167-2018-Rokovaci-poriadok-disciplinarnych-komisii-UNIZA.pdf
S 180_2019 The grant system of the University of Žilina in Žilina in the wording D1 to D2	04082021_S-180-2021-Grantovy-system-Zilinskej-univerzity-v-Ziline-v-zneni-Dodatku-c-2-26072021.pdf (uniza.sk)
S 200_2021 Rules of the selection procedure	https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/2021/02092021_S-200-2021-Zasady-vyberoveho-konania.pdf

S 202_2021 Criteria for filling the positions of professors and associate professors and principles for filling the positions of guest professors	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-202.pdf
S 207_2021 UNIZA code of ethics	https://www.uniza.sk/images/pdf/uradna-tabula/smernice-predpisy/2021/12072021_S-207-2021-Eticky-kodex-UNIZA.pdf
S 208_2021 Rules for obtaining alignment, modification and cancellation of rights for habilitation and inauguration proceedings	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-208.pdf
S 210_2021 Statute of the UNIZA Accreditation Board	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-210.pdf
S 211_2021 Procedure for obtaining scientific-pedagogical degrees and artistic-pedagogical degrees	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-211.pdf
S 213_2021 Policies for quality assurance at UNIZA	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-213.pdf
S 214_2021 Structures of the internal quality system	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-214.pdf
S 216_2021 Ensuring the quality of doctoral studies at UNIZA	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-216.pdf
S 220_2021 Evaluation of the creative activity of employees in relation to ensuring the quality of education at UNIZA	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-220.pdf
S 221_2021 Cooperation of UNIZA with external partners from practice	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-221.pdf
S 222_2021 Internal quality assurance system at UNIZA	https://www.uniza.sk/images/pdf/kvalita/2021/smernica-UNIZA-c-222.pdf
UNIZA website	www.uniza.sk
UNIZA's internal quality management system	https://www.uniza.sk/index.php/univerzita/vseobecne-informacie/vnutorny-system-kvality

Signature: prof. Ing. Ladislav Janoušek, PhD., v.r. Date: 04.12.2025