



UNIVERSITY OF ŽILINA
Faculty of Electrical Engineering

ECTS Information package

Academic year 2017/2018

PUBLISHER

University of Žilina
Faculty of Electrical Engineering
Univerzitná 1
010 26 Žilina
Slovakia

WWW: <http://fel.uniza.sk>

E-m@il: dean.office@fel.uniza.sk



This information package is meant for foreign students who plan to study for some period at the Faculty of Electrical Engineering of the University of Žilina (FEE UNIZA). It contains brief information about the University, the Faculty, about the town Žilina, basic requirements for studying here and detailed information about programmes and courses in the Faculty of Electrical Engineering.

INDEX:

1. [European Credit Transfer System](#)
2. [University of Žilina](#)
3. [Faculty of Electrical Engineering](#)
4. [Faculty Departments](#)
5. [Academic Calendar](#)
6. [Degree programmes](#)
7. [Graduate Profiles \(of the Bachelor, Master and Doctoral study\)](#)
8. [Registration Procedure](#)
9. [General Practical Information](#)
 - [Visa Obligation](#)
 - [The Slovak Republic](#)
 - [The City of Žilina](#)
 - [Student Associations](#)
 - [Study Facilities at the University](#)
 - [Accommodation](#)
 - [Catering](#)
 - [Health and Insurance](#)
 - [Bank Holiday](#)
 - [Leisure Activities](#)
 - [A Few Words of Slovak](#)
10. [Summary of courses offered for Erasmus+ incoming students](#)

EUROPEAN CREDIT TRANSFER SYSTEM - ECTS

What is ECTS?

ECTS, the European Credit Transfer System, was developed by the European Commission in order to provide common procedures to guarantee academic recognition of studies abroad. It provides a way of measuring and comparing learning achievements, and transferring them from one institution to another.

The ECTS system is based on the principle of mutual trust and confidence between the participating higher education institutions. Any higher education institution that intends to introduce ECTS under the Erasmus programme has to prepare and elaborate following three basic means:

1. Information Package (information about courses available).
2. Learning Agreement and other documents.
3. Credit System, in which credits are allocated to each course to describe the student workload.

Creation of ECTS

ECTS was established in the year 1989 within the frame of ERASMUS network, at the present as a part of the Lifelong Learning programme. ECTS is the only system which was successfully tested and used all over the Europe. ECTS was used at the beginning as a tool for the credits transfer. The system allowed the recognition of the study abroad and it enhanced the quality and number of motilities in the Europe. At the present ECTS develops towards the accumulation of credits and it is implementing on institutional, regional, national and European level. It is one of the main Bologna Declaration's objectives from June 1999.

ECTS Credits

ECTS credits are a value allocated to course units to describe the **student workload** required to complete them. They reflect the quantity of work each course requires **in relation** to the total **quantity** of work required to complete a full year of academic study at the institution that is lectures, practical work, seminars, private work - in the library or at home - and examinations or other assessment activities. ECTS credits express a **relative value**.

In ECTS, 60 credits represent the workload of a year of study; normally 30 credits are given for a semester and 20 credits for a term.

Credits are awarded only when the course has been completed and all required examinations have been successfully taken.

ECTS Students

Students participating in ECTS will receive full credit for all academic work successfully completed at ECTS partner institutions and they will be able to transfer these academic credits from one participating institution to another on the basis of **prior agreement** on the content of study programmes abroad between students and the institutions involved (Learning Agreement). When the student has successfully completed the study programme previously agreed between the home and host institutions and returns to the home institution, credit transfer will take place, and the student will continue the study course at the home institution without any loss of time or credit. If, on the other hand, the student decides to stay at the host institution and to take his/her degree there, he/she may have to adapt the study course due to the legal, institutional and departmental rules in the host country, institution and department.

ECTS Grading Scale

Examination and assessment results are usually expressed in grades. However, many different grading systems co-exist in Europe. Moreover, the area of grade transfer was highlighted as a major anxiety by student participants in ECTS, as indeed for exchange students in general. As a result, the European Commission convened a working group of experts to identify the issues involved. The ECTS grading scale has thus been developed in order to help institutions translate the grades awarded by host institutions to ECTS students. It provides information on the student's performance additional to that provided by the institution's grade; **it does not replace the local grade**. Higher education institutions make their own decisions on how to apply the ECTS grading scale to their own system.

1. Each institution awards marks/grades on the basis of its normal procedures and system and these marks form part of the student transcript.
2. The ECTS scale is designed as a „facilitating scale“ to improve transparency but not to interfere with the normal process of awarding marks within each institution or attempt to impose uniformity.
3. Within the broad parameters set out below each institution makes its own decision on the precise application of the scale taking account not only of the broad percentage descriptions but also the keywords (Excellent etc.).

ECTS grading scale

ECTS grade	% of successful students normally achieving the grade	Definition
A	10	EXCELLENT - outstanding performance with only minor errors
B	25	VERY GOOD - above the average standard but with some errors
C	30	GOOD - generally sound work with a number of notable errors
D	25	SATISFACTORY - fair but with significant shortcomings
E	10	SUFFICIENT - performance meets the minimum criteria
FX	-	FAIL - some more work required before the credit can be awarded
F	-	FAIL - considerable further work is required

It is necessary to distinguish between the grades F and FX. The FX grade indicates that the student failed but if he/she worked a little more, he/she would be successful without repeating all study requirements. The student, evaluated by the grade F, has strong limitations, additional study and repeating of all study requirements is required.

GENERAL DESCRIPTION OF THE UNIVERSITY



The University of Žilina is the public educational institution. The University was established in 1953 as College of Railways in Prague. Since 1962, located in Žilina, it is spreading its educational and research activities to many different areas. Since 2000 the University of Žilina has been a member of the European University Association (EUA). In 2009 the Slovak Accreditation Committee for the 1st time categorized all Slovak higher education institutions and assigned the University of Žilina the status of “Research University” which indicates its top ranking.

The University of Žilina includes the following faculties:

- Faculty of Operation and Economics of Transport and Communications (<http://fpedas.uniza.sk>)
- Faculty of Mechanical Engineering (<http://fstroj.uniza.sk>)
- Faculty of Electrical Engineering (<http://fel.uniza.sk>)
- Faculty of Civil Engineering (<http://svf.uniza.sk>)
- Faculty of Management Science & Informatics (<http://fri.uniza.sk>)
- Faculty of Humanities (<http://fhv.uniza.sk>)
- Faculty of Security Engineering (<http://fbi.uniza.sk>)

Contacts

Rector

Prof. Tatiana Čorejová
email: rektor@uniza.sk

Vice-Rector for Foreign & Public Relations; Erasmus+ Institutional Coordinator

Assoc. Prof. Jozef Ristvej
email: Jozef.Ristvej@uniza.sk

Vice-Rector for Education

Assoc. Prof. Milan Trunkvalter
email: Milan.Trunkvalter@uniza.sk

Vice-Rector for Science & Research

Prof. Ing. Ján Čelko
email: Jan.Celko@uniza.sk

Vice-Rector for Development

Prof. Jozef Jandačka
email: Jozef.Jandacka@uniza.sk

Vice-Rector for Information Systems

Prof. Karol Matiaško
email: Karol.Matiasko@uniza.sk

Erasmus+ Institutional Administrator

MSc. Lenka Kuzmová
email: kuzmova@uniza.sk

Address of the University of Žilina

Rectorate of the University of Žilina
Univerzitná 1
010 26 Žilina
Slovakia

GPS: 49°12'8.26"N
18°45'23.6"E

E-m@il: info@rekt.uniza.sk

www: <http://www.uniza.sk>

Phone: +421/41/513 5151
+421/41/513 5133

Fax: +421/41/513 5051
+421/41/513 5056

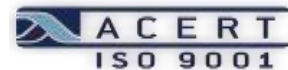
GENERAL DESCRIPTION OF THE FACULTY

The Faculty of Electrical Engineering is a part of the University of Žilina - a modern university providing a full range of technological, economic, management, and a limited range of humanistic and natural science education at under-graduate, graduate and post-graduate levels.

During its 60-year existence the University has become a reputable institution with the firm position in the system of the Slovak higher education institutions. It was originally established in 1953 by the College of Railways in Prague. In 1959 the College changed its name to the University of Transport and in 1962 moved to Žilina. Afterwards, as a result of the increasing role of communications, the name was amended to the University of Transport and Communications. The year 1989 started a series of transformation and restructuralisation steps that brought essential changes into the academic life of the University and its Faculties and Institutes. They proved effective on the way towards a modern institution, featuring a character of a full-value university, named the University of Žilina since November 1996.



The Faculty of Electrical Engineering was first technically oriented Faculty and generally the second Faculty in the Slovak Republic awarded the Quality Certificate for quality control system according to ISO 9001 (in 2003). Since that time further three successful re-certifications occurred (2007; 2010, and 2013).



Contacts

Dean

Prof. Pavol Špánik
email: dean@fel.uniza.sk

Vice-dean for Education, ECTS Coordinator

Assoc. Prof. Peter Bracíník
email: education.vicedean@fel.uniza.sk

Vice-dean for Research

Assoc. Prof. Peter Hockicko
email: research.vicedean@fel.uniza.sk

Vice-dean for Development and International Co-operation; Erasmus+ Coordinator

Prof. Peter Brída
email: international.vicedean@fel.uniza.sk

ECTS coordinator provides counselling to incoming student from other universities, who are planning to study at the Faculty of Electrical Engineering of UNIZA for some period of time and to students of the Faculty of Electrical Engineering outgoing to study to other universities. There are also other ECTS coordinators at Faculty's departments (contacts are written in the part "Faculty's departments").

Erasmus+ Faculty Administrator

MSc. Silvia Pirníková
email: international.office@fel.uniza.sk

Address of the Faculty of Electrical Engineering

Faculty of Electrical Engineering
University of Žilina
Univerzitná 1
010 26 Žilina
Slovakia
E-m@il: dean.office@fel.uniza.sk
WWW: <http://fel.uniza.sk>
Phone: central office: +421/41/513 1111
Secretariat: +421/41/513 2051
Fax: +421/41/513 1515

FACULTY DEPARTMENTS

The departments that form the basis exist for already a long time and by its activities they gradually created the main orientation in pedagogical and research-scientific field.

The Faculty of Electrical Engineering has seven departments in Žilina and one institute located at the work place in Liptovský Mikuláš (a little town situated approx. 100 km to the East from Žilina):

- Department of Physics (DPH)
- Department of Measurement and Applied Electrical Engineering (DMAEE)
- Department of Electromagnetic and Biomedical Engineering (DEBE)
- Department of Mechatronics and Electronics (DME)
- Department of Power Electrical Systems (DPES)
- Department of Control and Information Systems (DCIS)
- Department of Multimedia and Information-communication Technologies (DMICT)
- Institute of Aurel Stodola in Liptovský Mikuláš (IAS LM)

◆ Department of Physics (DPH)

Head of the Department: Prof. Dušan Pudiš
Phone: +421/41/513 2300
Fax: +421/41/513 1516
Email: ktf@fyzika.uniza.sk
www: <http://fyzika.uniza.sk>

Departmental Erasmus+ coordinator: Ivana Lettrichová, PhD.
Phone: +421/41/513 2306
Email: kubicova@fyzika.uniza.sk

Advances in technical fields have always relied to a large degree on know-how and methods originating in physics. Many phenomena and principles studied today in physics become the basis of applications of tomorrow, e.g. in quantum information science. It is therefore very important to provide the students of the technical fields with good basics of mathematics and physics.

The Department of Physics teaches General Physics to students of all faculties of the University of Žilina and several specialized Advanced Physics courses. The Department provides the students with the basic understanding of physics, trains them in applying the principles of physics to various engineering problems as well as gives the students a review of modern physics.

The Department is divided into three sections according to their research and educational specialization. The staff consists of 3 Professors, 6 Associate Professors, 12 senior lecturers, 6 internal Ph.D. students, 4 research fellows and 3 technical/administrative workers who support the research and teaching activities of the Department.

The research carried out at the Department is mostly concerned on



the utilization of acoustic and optical wave processes for investigation of condensed matter. Acoustic Group exploits a wide range of acoustic methods and techniques as well as acoustoelectric and acoustooptic phenomena to investigate semiconductors, metals, ion glasses and magnetic liquids. New acoustic techniques are also developed.

Optical group studies physical properties of the conventional telecommunications optic fibres and special fibres such as capillary fibres and photonic fibres. The group has extended its activities to include technologies of preparation and analysis of photonic structures for integrated optics and optoelectronics. The latest results are from the area of optofluidic waveguides where sensors and optic elements are being developed. Self-diffraction of light in magnetic fluids and photorefractive phenomenon in selected condensed matter materials are also studied within the group.

The theoretical high-energy physics group works in the area of strong electroweak symmetry breaking, quark-gluon plasma and spin structure of light nuclei.

The research groups of the Department are well known abroad. The scientific activities of the Department are regularly presented at the international conferences and are published in significant physical journals. The members of the staff also participate in various educational and scientific activities outside the Department and the University, especially as members of various scientific boards at both domestic and international institutions. There are also many activities focused on further education of high school and elementary school Physics teachers and their pupils and students, which is an important outreach work.

◆ **Department of Measurement and Applied Electrical Engineering (DMAEE)**

Head of the Department: Assoc. Prof. Miroslav Gutten

Phone: +421/41/513 2110

Fax: +421/41/513 1529

Email: kmae@fel.uniza.sk

www: <http://fel.uniza.sk/kmae/>

Departmental Erasmus+ coordinator: Assoc. Prof. Dagmar Faktorová

Phone: +421/41/513 2112

Email: dagmar.faktorova@fel.uniza.sk

Department of Measurement and Applied Electrical Engineering (DMAEE) was founded by dividing of the Department of Theoretical and Applied Electrical Engineering. The history of the department however started in 1953 when at the Railway University in Prague was originated and the Department of Electrical Engineering including the Cabinet of Theoretical Engineering was its part. The independent department was originated in 1957 named



Department of Theoretical Electrical Engineering and Electrical Machines providing teaching of electrical engineering subjects for electrical engineering studies. The first subject taught at the Faculty of Electrical Engineering was “Foundations of electrical engineering”. Successively the pedagogical process was extended with the subjects as theory of electrical engineering, electrical measurement and the department started to provide teaching of subjects of theory of electrical machines and electrical machines construction as well. After removing the university from Prague to Žilina and changing its name to the University of Transport, the department began providing teaching of electrical engineering subjects at non-electrical study branches and at the same time the Department of Electrotechnology was separated.

In 1986 the branch of electrical machines was separated from the department and the new department was named to Department of Electrical Engineering. In 1993 the department was renamed to Department of Theoretical and Applied Electrical Engineering. In 2005 the department had two branches: Division of Theoretical Electrical Engineering and Division of Applied Electrical Engineering and Measurement. Two independent departments: Department of Electromagnetic and Biomedical Engineering and Department of Measurement and Applied Electrical Engineering arose from the original department.

The Department guarantees bachelor degree study of two study programs: Automobile Electrical Engineering and Commercial Electrical Engineering. The staff of the DMAEE guarantees and provides the course Measurements and Measuring Systems for all students at the Faculty of Electrical Engineering of the University of Žilina, sectional course for students in study program Automobile Electrical Engineering and course Electrical Engineering for students at other faculties of the University of Žilina.

◆ **Department of Electromagnetic and Biomedical Engineering (DEBE)**

Head of the Department: Prof. Klára Čápková

Phone: +421/41/513 2100

Fax: +421/41/513 1519

Email: ktebi@fel.uniza.sk

www: <http://fel.uniza.sk/ktebi>

Departmental Erasmus+ coordinator: Branko Babušiak, PhD.

Phone: +421/41/513 2147

Email: branko.babusiak@fel.uniza.sk

The history of the department began in the year 1953 at the Faculty of Electrical Engineering of the University of Railways in Prague. The original name was the Department of Theoretical Electrical Engineering and Electric Machines.

The educational activities have partially changed in 1986 due to the separation from the Electric Machines section. To reflect this change, the name of the department was



amended to the Department of Theoretical Electrical Engineering. Since 1989, after inclusion of non-electrical branches of study programmes of other faculties at the University of Žilina, the department was renamed to the Department of Theoretical and Applied Electrical Engineering.

Due to reorganization in 2005, the department has been divided into two independent departments - the Department of Electromagnetic and Biomedical Engineering (DEBE) and the Department of Measurement and Applied Electrical Engineering.

At present, the Department of Electromagnetic and Biomedical Engineering has two sections. The Electromagnetic Engineering section provides courses and lectures of Electric Circuits 1, 2, 3, Electromagnetic Field, for the students of the Faculty of Electrical Engineering. The Biomedical Engineering section includes interdisciplinary and special subjects oriented towards students of Biomedical Engineering (BME) study programme. Main subjects include: Sensors and Measuring Methods in BME, Wave Processes in BME, Modelling and Simulation of Electric Circuits in BME, Signal Processing in Medicine, Compatibility of Biological and Technical Systems, Medical Electronics, Instrumentation in Medicine, Artificial Intelligence in BME, Bachelor's Thesis and defense thereof, Bachelor's Project 1 and 2, Diploma Project, Diploma Seminar and Diploma Thesis etc.

The department offers Biomedical Engineering bachelor and masters study programs in cooperation with the Comenius University in Bratislava - Jessenius Faculty of Medicine in Martin (JLFUK). The study program was officially accredited for the first-time at the Faculty of Electrical Engineering, UNIZA in year 2000. The last successful accreditation, for both the Bachelor and Master Degree studies, took place within complex accreditation of the UNIZA in 2015. The mentioned study program gained considerable popularity during the last decade both in Slovakia and abroad and is the preferable topic of various current and future research projects. In addition to long term cooperation with JLFUK Martin and the Institute of Measurement Science of the Slovak Academy of Sciences, new interdisciplinary collaboration has been established between the department and several important subjects in the field of science and research.

Apart from BME studies, the Department of Electromagnetic and Biomedical Engineering also guarantees the postgraduate doctoral programme Theory of Electrical Engineering (TEE). The DEBE staff guarantees and provides courses for PhD. study in TEE. The study programme TEE has also been accredited by the last complex accreditation of the University of Žilina in 2015. The Faculty of Electrical Engineering repeatedly obtained the rights to

habilitate associate professors and to inaugurate full professors in this study field. The DEBE guarantees both mentioned processes.

The department has three laboratories: two of them are for educational purpose (Laboratory of Experimental Electromagnetic Engineering and Laboratory of Biomedical Engineering) and one for research activities (Laboratory of Electromagnetic Methods).

The research activities of the department are mainly oriented towards investigation of electromagnetic field and its interactions with various media, methods and tools of material non-destructive evaluation, problems of electromagnetic compatibility and biocompatibility, biomedical sensors and modelling, intelligent textiles, simulations of dynamic biological systems with regards to medical diagnostics and electromagnetic field influence on living organisms.

◆ Department of Mechatronics and Electronics (DME)

Head of the Department: Assoc. Prof. Michal Frivaldský

Phone: +421/41/513 1600

Fax: +421/41/513 1524

Email: kme@fel.uniza.sk

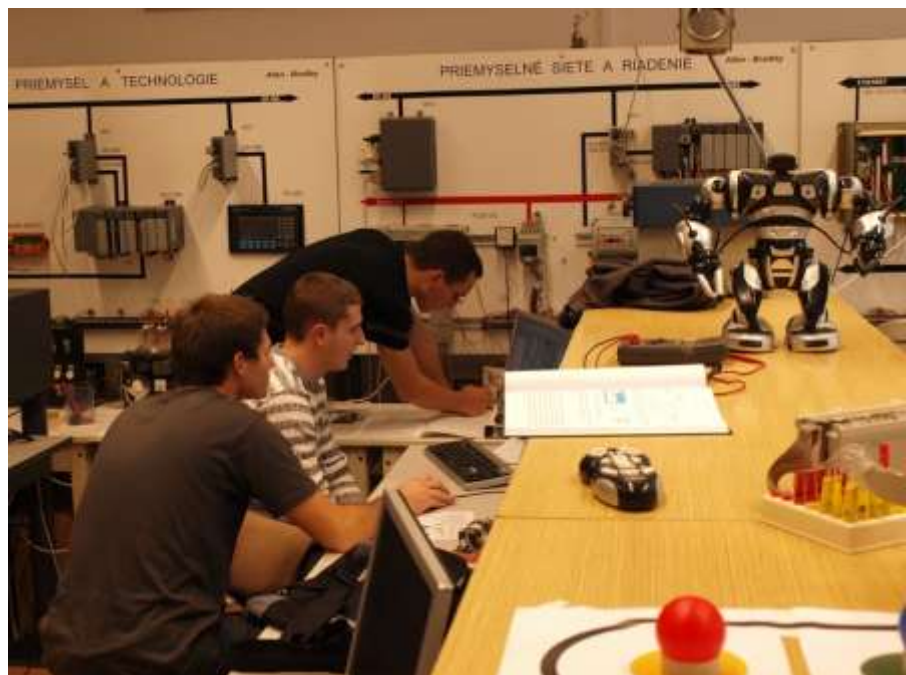
www: <https://kme.uniza.sk>

Departmental Erasmus+ coordinator: Assoc. Prof. Michal Frivaldský

Phone: +421/41/513 1621

E-mail: michal.frivaldsky@fel.uniza.sk

Department of Mechatronics and Electronics (DME) is a part of the Faculty of Electrical Engineering (FEE) at the University of Žilina. It is a workplace whose primary task is to train experts in the area of electronics, industry automation, power-electronic and mechatronic systems on all levels of university education. Great importance is scientific-research activity of the department which is



realized by variety of projects funded from international and national grants.

Department team is led by group of internationally recognized professors and associated professors with high scientific and educational erudition. Part of this group is also younger researchers and post-doctorate students. Strong part of the team is represented by full-time doctoral students with significant participation in scientific-research activity.

The department supports wide variety of activities in addition to already mentioned. Department supports research for industrial, national and foreign subjects and variety of student's activities and projects.

Within the year the updating of laboratory equipment was completed. Significant progress has been made in building of educational-research laboratories.

In the last year the research activity of the Department has achieved a significant increasing implemented by means of grant projects. Department staff participated in several international and national projects within the frame of which the department has cooperated with several prestigious Slovak institutions (the Technical University of Košice, Slovak Technical University in Bratislava and Jesenius Faculty of Medicine of the Comenius University in Martin). These projects represent a very significant support to research which has been done at our department.

In the year 2016 the department involved eighteen members of educational staff, three research workers, seventeen full-time PhD students and three part-time PhD students. From the point of view of internal structure it has been divided into three sections. The first one is focused on power- and applied electronics, the second one is operating in the field of mechatronics, autotronics, and industry automation. The third section deals with special electronics focused on applications in medicine and mechatronic systems.

The department provides educational process at all three levels of the university study. The bachelor degree is covered by the accredited study program Electrical Engineering (specialization in Mechatronic Systems and Autotronics). Master degree includes the accredited study program Power Electronic Systems (in specializations Power Electronics, Mechatronic and Automotive Systems, and Autotronics and electro-mobility). In doctoral study the department staff participated in providing training courses in Power Electronics and Telecommunications and Automation.

Within the frame of pedagogical activities the department has been providing education of electronics, mechatronics, micro-computer systems involving industrial controllers and power electronics at the Faculty of Electrical Engineering, and also at other faculties of the University of Žilina. Such education has been dedicated for different study branches and specializations in the bachelor, master and doctoral studies, both in internal and external ones.

The department realised and provided research and development, expertises and contracts, and develops publication activity in the field of electronics, control systems, mechatronics and power electronics mainly. Further education is provided by the department in the field of power electronic systems, microcomputer control systems, industrial controllers and programmable logic systems.

Professional activities of the department have been applied and disseminated on creation and operation of quality and reliable electronic devices and systems, application of programmable logic areas in design of electronic systems, reconfigurable circuits study as well as diagnostics and analysing of the failures using image analysis. Topology optimizing for power semiconductor converters and their electro-magnetic compatibility belongs to main activities of the department.

In the present time the department operates with eight laboratories dedicated for pedagogical operation, including final projects, final and master thesis. Beside above mentioned labs the department offers for utilizing three high-tech workplaces dedicated for research and development activities and to experimental part of PhD study. These are the laboratory of power electronics, the laboratory of digital image processing and laboratories of digital signal processors and industrial programmable logic controllers.

◆ **Department of Multimedia and Information-communication Technologies (DMICT)**

Head of the Department: Prof. Róbrt Hudec

Phone: +421/41/513 2200

Fax: +421/41/513 1520

Email: kt@fel.uniza.sk

www: http://ktam.uniza.sk/ktam-new/?lang=en_us

Departmental Erasmus+ coordinator: Assoc. Prof. Peter Počta
Phone: +421/41/513 2242
Email: peter.pocta@fel.uniza.sk

The Department was founded in 1967. In the first years, activities of the Department were concentrated on circuits' theory and signals, digital and impulse techniques, transmission systems and switching systems, telecommunication networks and their reliability. Over the time aim of the Department has been directed towards modern trends in communication



technologies. Several new laboratories have been built and education has been gradually increasing in a domain of software oriented-courses. In recent years specialization of the Department has been extended also to the area of multimedia technologies including multimedia content development. In 2008 name of the Department was changed to the Department of Telecommunications and Multimedia (DTaM).

At the present, the research and education of the Department is covered by wide range of activities related to information and communication technologies (ICT) and multimedia technologies. In the field of telecommunication technologies, attention is focused on communication networks, access technologies, convergence of network technologies with main activities oriented on quality of media services. Regarding fixed networks technologies, great effort is aimed on wideband optical networks. The Department is also equipped with Cisco and MikroTik technologies and certified lecturers.

Area of wireless technologies is directed towards mobile and satellite communications, positioning systems as well as to DVB-x. In the field of multimedia technologies, interest is oriented on multimedia content creation. This specialization incorporates the courses on fundamental of image composition, film directing, multimedia editing and post-processing, etc. Special interest is focused on computer graphics, web applications and enhanced technologies of audio-visual streams processing. Significant research activities are performed in digital signal processing from semantic analyses of audio and video signal point of view. The main target of this area is a complex support of future multimedia services. Regarding the number of students that have been studying at departments, DTaM belongs among the biggest departments at the Faculty of Electrical Engineering.

◆ **Department of Control and Information Systems (DCIS)**

Head of the Department: Prof. Juraj Spalek
Phone: +421/41/513 3300
Fax: +421/41/513 1515
Email: kris@fel.uniza.sk
www: <http://kris.uniza.sk>

Departmental Erasmus+ coordinator: Prof. Aleš Janota
Phone: +421/41/513 3356
Email: ales.janota@fel.uniza.sk

The Department of Control and Information Systems (further referred to as the DCIS) guarantees four study programmes in the field of study Automation at the University of Žilina. Specifically, it is the study programme Automation in Bachelor degree, study programme Process Control Engineering and Applied Telematics in Master degree and study programme Process Control Engineering in the Doctoral degree.



The research activities of DCIS are oriented in the field

of information and safety-related system analysis and synthesis ranging from solution of theoretical models to practical projects of operation including implementation. There are many sectors of activities in which the DCIS has an exclusive position in the Slovak Republic, especially in expertise activities in the field of analysis and synthesis of railway interlocking systems.

The area of reliable and safe information transmission and processing in control of selected critical processes both in safety-related systems for all kinds of transport, complex technologies and in security systems for protection of humans and property provides dynamic incentive for all the staff. Realization of information services for operative control supported by automation and computer technology is applicable in decisive branches of the national economy.

The activities performed at the DCIS are integrated to the national and international co-operation with academic and industry sphere and realized through various forms - from research projects to exchanges of students and experts.

In 2016, the staff of the DCIS consisted of 17 pedagogical staff, 2 technicians and administrative support and 6 full-time postgraduate students. The pedagogical staff consisted of 4 professors, 1 guest professor, 3 associate professors, 7 senior lecturers with PhD. degree, and 2 research fellows with a PhD. degree.

◆ **Department of Power Electrical Systems (DPES)**

Head of the Department: Prof. Juraj Altus
Phone: +421/41/513 2150
Fax: +421/41/513 1518
Email: kves@fel.uniza.sk
www: <http://www.kves.uniza.sk>

Departmental Erasmus+ coordinator: Pavol Makyš, PhD.
Phone: +421/41/513 2150
Email: pavol.makys@fel.uniza.sk

Department of Power Electrical Systems was founded in the academic year 1955/56 as the Department of Electric Traction and Energetics at the Railway University in Prague. Since 1992 the department has been a part of the Faculty of Electrical Engineering.

The department had originally an accreditation in a field of "Electric Traction and Energetics". Graduates of the department were formerly trained mainly for 24 and 12 FMD, for industrial plants producing electric traction equipment (Škoda Pilsen, ČKD Trakce Prague, ŽOS Nymburk, ZOS Vrútky), for both urban and industrial transport and for the scientific and research laboratories in the electro-technical industry.

The highly important period for the department was during years 1991 – 1994. In those years, a TEMPUS project JEP-1939/91-94 was accepted and realized. The project titled "Improvement of Educational Activities in Power Electronics and its Applications" considerably affected the next heading of the department. The aims of the project were: a creation of a new curriculum for Power Electronics, Electric Drives and Electrical Machines, setting up new laboratories, purchase of computing and measuring hardware, mobility of students and staff. The universities in Catania, Roma, London and Helsinki co-operated and guaranteed this project. The results of the project set the department forward in its effort to become a modern department with a high-level educational programme. In 1996 the department finished a TEMPUS project JEN-01939SQ-94 representing a continuity of the project mentioned above.

In 2005, the Faculty of Electrical Engineering underwent a vast reconstruction. A section of Power Electronics was secluded from the Department of Power Electrical Systems together with a part of Department of Electronics and Electrotechnology and formed a new Department of Mechatronics and Electronics.

Change of the labour market enforced the department, besides its own traditional educational and research activities, to look for other possibilities of employability of its graduates. Nowadays the department is divided into the section of Electric Power Systems and section of Electric Drives and Electric Traction. Educational and research activities of these sections guarantee a wide professional orientation which covers almost whole power electrical engineering branch.

In the academic year 2005/2006, a three-degree study has been put to an effect at all universities in Slovakia. Department of Power Electrical Systems has been granted an accreditation for a bachelor degree in a programme of studies of Electrical Engineering; for master degree in programme of Electric Power Systems, Electric Drives and Electric Traction. For PhD degree, third study degree, the department was accredited in a study programme of Power Electrical Engineering.



Within the complex accreditation in 2009, University of Žilina confirmed its position as university. Department of Power Electrical Systems gained right to bestow the Bachelor degree in study program of Electrical Engineering, academic master degree in study programs of Electric Power Systems, Electric Drives and Electric Traction.

Within the latest complex accreditation in 2015, all the study programs have been accredited except of Electric Traction, which became a part of the Electric Drives program.

Since 1997 the department has had an accreditation for PhD degree study in a field of "Power Electrical Engineering", with the following branches: Electric Drives, Electric Machines and Apparatus, Power Electronics and Electric Traction.

Department is equipped with high quality computer and measuring technology in the area of technical infrastructure. The substantial improvement of department was achieved mainly by the help of EU Structural Funds, which enabled reconstruction of rooms of department as well as the departments' instrumentation. This was possible mainly by the project: Centre of excellence of power electronics systems and materials for their components I., II.

NXP Semiconductor (former Freescale Semiconductor) from the Czech Republic provided a big support for the department by generalizing latest technologies in the area of digital signal controllers. Department was able to apply for grant research projects on this basis. Department solved several VEGA, KEGA and SRDA projects recently, which have identified students, graduates and staff of the department.

Department intensively cooperates with significant companies from Slovakia. These are mainly Slovenské elektrárne, Slovenská elektrizačná prenosová sústava, Stredoslovenská energetika, EVPÚ Nová Dubnica, NXP Semiconductor, SIEMENS, ŽSR, SEZ Krompachy and others.

◆ **Institute of Aurel Stodola in Liptovský Mikuláš (IAS LM)**

Director of the Institute:

Prof. Jarmila Müllerová
Phone: +421/41/513 1740
Fax: +421/44/562 3976
Email: mullerova@lm.uniza.sk
www: <http://lm.uniza.sk/~kzi/>

Departmental ECTS coordinator: Gabriel Cibira, PhD.

Phone: +421/41/ 513 1744
Email: cibira@lm.uniza.sk

Institute of Aurel Stodola (IAS), the educational and research institute of FEE located in Liptovský Mikuláš, is a departmental-level workplace providing students standard conditions for university studies. IAS offers students the accredited bachelor's degree programme of Digital Technologies within the field of Telecommunications, both in full-time and part-time forms of study.

IAS demonstrates continuous research activities in the field of the study branch. Therefore new knowledge can be fully integrated into the education and adequately communicated to the students. IAS has been hosting two distinguished professors – experts in advanced optical technologies and components. In addition to the research in the field of optical components for the physical layer of optical networks and control of modular optical systems IAS addresses scientific issues in the field of alternative energy sources, especially photovoltaics. The guidelines are diagnostic methods for solar cells, physical properties of thin films and thin film structures, especially for solar cells and hybrid electronics, and the theory of real functions. The scientific work is closely related to long-term cooperation with the Slovak Academy of Sciences and several Slovak and foreign universities. In

the laboratory for testing the photovoltaic cells and the thin-film laboratory equipped with advanced facilities IAS has been exploring the interface morphology and microstructure properties of solid state structures using scanning probe methods and electrical parameters of solar cells allowing the photovoltaic conversion efficiency



analysis. In 2016 IAS as every year organized the conference with international participation Alternative Energy Resources ALER and participated in the organization of other international scientific conferences.

In 2016 IAS as the main organizer organized the 20th anniversary international scientific Slovak-Czech-Polish Optical Conference on Wave and Quantum Aspects of Contemporary Optics that belonged to the series of events organized every two years by turns in Slovakia, the Czech Republic and Poland to present knowledge about advanced research in different fields of optics. The 2016 conference was attended by over 130 experts from 7 countries. IAS organizers edited the conference proceedings issued by SPIE – a distinguished international company promoting advanced interdisciplinary research in the field of optics and photonics.

Each department has its own subject library, which contains scientific and technical publications relevant to department's activities. Lectures, seminars and exercises take place in the university's classrooms. Laboratory work takes place in departmental laboratories.

Teaching is organised in two 13-week semesters: Autumn semester (lectures are from September to December) and Spring semester (lectures are from February to May). The schedule for the academic year 2017/2018 is given in the following table.

Academic year 2017/2018 schedule

The beginning and the end of academic year: 1st September 2017 – 31st August 2018	
AUTUMN SEMESTER	
Teaching period	25.09. – 22.12.2017
Examination period	08.01. – 16.02.2018
SPRING SEMESTER (except of the final year of study)	
Teaching period	19.02. – 18.05.2018
Examination period	21.05. – 13.07.2018
Study termination and spring semester for 3rd year of Bc. and 2nd year of MSc. study	
Teaching period for 3rd year of Bc study	19.02. – 11.05.2018
Examination period for 3rd year of Bc study	14.05. – 01.06.2018

The Faculty of Electrical Engineering offers BSc. degree study (standard duration of full time study is 3 years), MSc. degree study (standard duration of full time study is 2 years) and doctoral degree study (standard duration of full time study is 3 years).

The courses are divided into three groups: compulsory courses, optional courses and free choice courses.

Students are examined according to:

- work during the semester in seminars and laboratories (elaborating reports, passing the tests, etc.),
- exam (usually written and oral).

Students' results are evaluated by six point scale with the marks A (the best) up to FX (fail). Detailed grading scale is presented in the following table.

Grading scale of the Faculty of Electrical Engineering

Grade at the Faculty (ECTS grade)	Definition	Knowledge in level of given %
A	EXCELLENT - outstanding performance	level of 93 – 100 %
B	VERY GOOD - above the average standard	level of 85 – 92 %
C	GOOD - generally sound work	level of 77 – 84 %
D	SATISFACTORY - fair but with significant shortcomings	level of 69 – 76 %
E	SUFFICIENT - performance meets the minimum criteria	level of 61 – 68 %
FX	FAIL - considerable further work is required	level less than 61 %

Part of the study can be accomplished at other university (abroad) under the framework of ERASMUS+, programme of the European Union. ERASMUS+ is the programme focused to cooperation in education, introduction of European dimension, language background improvement and to utilisation of a new information and communication technologies.

Students participating in Erasmus+ mobility will receive credits for all academic work successfully carried out at the partner institution. These academic credits are given on the basis of prior agreement (Learning agreement). Incoming and outgoing students, who fulfil the conditions stated in the Learning Agreement, will have all awarded credits recognised at their home university.

DEGREE PROGRAMMES

A summary of accredited study fields and programmes:

Field of Study	Study Programme	Study Degree
Biomedical Engineering	Biomedical Engineering	Bachelor
Control Engineering	Control Engineering	
Electrical Engineering	Autotronics	
Electrical Engineering	Electrical Engineering	
Telecommunications	Telecommunications	
	Multimedia Technologies	
	Digital Technologies *	
Biomedical Engineering	Biomedical Engineering	Master
Electrical Engineering	Electric Drives	
	Electric Power Systems	
	Power Electronic Systems	
Control Engineering	Process Control	
Control Engineering	Applied Telematics	
Electronics	Photonics	
Telecommunications	Telecommunication and Radiocommunication Engineering	
	Multimedia Engineering	
Electric Power Systems	Electric Power Systems	Doctoral
Electro-technologies and Materials	Electro-technologies and Materials	
Control Engineering	Process Control	
Power Electrical Engineering	Power Electrical Engineering	
Telecommunications	Telecommunications	
Theory of Electrical Engineering	Theory of Electrical Engineering	

*) study programme is taught only at the Institute of Aurel Stodola in Liptovský Mikuláš. The other courses can be studied only in Žilina.

GRADUATE PROFILES

BACHELOR STUDY PROGRAMMES

BIOMEDICAL ENGINEERING

The graduate will acquire knowledge in the subjects of theoretical and technical basis, as well as in theoretical basis of medical disciplines with emphasis on the structure and functioning of biological objects, biochemical, physiological and pathophysiological processes. He/she will gain knowledge of medical technique and its applications, modern tools of biomedicine, principles of their activities, conditions for operation and their safe for diagnostic and treatment purposes. He/she is able to evaluate functionality of technical and computer aided equipment under given conditions of a health care facility or other operations and laboratories and at the same time able to lead qualified communication with the health care staff. He/she will successfully apply as an expert in medical and biological laboratories, in the operation of biomedical technique, in business and service organisations.

Software skills: C language, MATLAB, EAGLE.

CONTROL ENGINEERING

The graduate will acquire education in the field of control engineering and process control with the support of information and communication technologies. He/she has also practical experience in application of safety critical control and communication systems performed mainly based on PLC and industrial networks. He/she will successfully apply in the operation of control and information systems at the process and operative level. Theoretical knowledge acquired during the bachelor study will create good prerequisites for further education, either within the further forms of university study or within lifelong education.

Software skills: C language, C++, MATLAB, PLC, ATMEL, MS ACCESS, HTML, CSS, Tia Portal.

AUTOTRONICS

The graduate will acquire basic and general knowledge required in wide spectrum of electrical proficiency especially in areas of automobile electronics, hybrid vehicles and electromobility. The gained knowledge is needed for the second degree study programs in this study program or affinitive ones. Even if a graduate would not continue in the next level of the university studies, he/she will gain required wide professional profile and he/she is able to adapt in different technical or other businesses. The graduates of Autotronics study program should be professionals who are able to identify various electronic faults in cars. They can successfully apply mainly in car services and repair workshops, car selling shops and in education institutions.

Software skills: C language, C++, MATLAB, Simulink, CodeWarrior, CodeComposer, Asembler, AVR Studio, Vissim, PLECS.

ELECTRICAL ENGINEERING

The graduate will acquire knowledge from the subjects of theoretical base applied in the fields of power electronics, utilisation of applied microprocessor technique and programming, electric drives, electrical traction, electric power systems and mechatronics. He/she will gain knowledge in the field of quality management and reliability in a production company, marketing and trade, electrical standards, rights and legal regulations related to the field of study. Graduates may further specialise in the field of automobile electrical engineering, electrical traction, electric drives, electric power systems, power electronic systems and mechatronics systems. Graduates obtain theoretical knowledge and practical experience in order to acquire the principles, installations, operations, functions, service and repairs of

electrical products, devices and equipment in compliance with international standards. He/she will successfully apply in all fields of power electrical engineering, in the field of mechatronics, robotics, applied microprocessor technique, electronics, optoelectronics, power electronics, computer design and construction in organisations of administrative, production, operation or repair character.

Software skills: MS Office, MATLAB, SIMULINK, FEMM, MOTORSOLVE, SICHR, DIALUX, DSPACE, CODE WARIOR, LABWIEV, EMPT-ATP, MODES, GE-PSLF, RUPLAN, RS Logix, RS Link, RS View, Assembler, AVR Studio, EAGLE, OrCAD-PSPICE, PLECS.

TELECOMMUNICATIONS

The graduate will acquire necessary theoretical and specific knowledge, information on technologies and methods from the field of transmission and processing of all information types, on the structure and operation of respective equipment and systems of fixed and mobile networks. He/she has knowledge in information technology utilisation in the given field, as well as knowledge in economics, management, psychology and legal regulations. He/she may successfully operate in companies focused on the area of communication and information technologies as an executive and managing employee.

Software skills: C language, C++, MATLAB, Java, JSP, Blender, 3dMax, Cinema 4D, Audition, Protools, Premierepro, HW, Adobe InDesign, SQL, PSpice, Microsim, Adobe Illustrator, Corel Draw, QuarkxPress, LaTeX, Blender, 3dMax, Cinema 4D, Photoshop, MS Office, MATLAB, SIMULINK, from SPICE family – simulation programs oriented on analyses and syntheses of electronic circuits, EAGLE, LabView, VPIphotonics.

MULTIMEDIA TECHNOLOGIES

The graduate will acquire knowledge in acquisition, processing and presentation of digital signal at an adequate technical, aesthetical, ethical and art levels. The synergy of technical and art education will make the graduate a specialist in creating multimedia presentations. The graduate will gain knowledge and practical experience in working with the screen and the sound element of multimedia that predetermines him/her for working in organisations focused on information technologies, advertising and counselling activities, in public administration institutions, in studios producing multimedia products.

Software skills: C language, C++, MATLAB, Java, JSP, Blender, Cinema 4D, Adobe Premiere, Adobe Audition, Adobe Photoshop, Adobe Illustrator, Adobe InDesign, Protools, HW, SQL, PSpice, Microsim, Corel Draw, QuarkxPress, LaTeX.

DIGITAL TECHNOLOGIES

The graduate will acquire knowledge from the basic disciplines in the field oriented to general professional knowledge in the area of digital technologies, electronics, optoelectronics, communication systems, networks and services, transmission media to be connected with obtaining practical experience in the field of digital technologies, mainly information processing, transmission and communication systems. He/she will gain experience and skills in the field of digital system operation. Apart from that, he/she will acquire basic legal, economic and managerial knowledge to be utilised in the field of digital system services, digital security and language skills including specific terms. The graduate will apply successfully as a technician, technologist or manager of technician team, administrator of digital devices and systems.

Software skills: C language, C++, PHP, JavaScript, MySQL, Flash animations, Code Blocks, LabView, PHPMyAdmin, MySQLWorkbench, ILEAD GIF Animator, XARA X, ADOBE Imagereak, Adobe After Effects, AVI 3d studio, DiagramDesigner, HTML Kit.

MASTER STUDY PROGRAMMES

BIOMEDICAL ENGINEERING

The graduate has an overview of modern technical tools of biomedicine, diagnostic, therapeutic and rehabilitation devices, their safe use and the world trend in their development. He/she gains knowledge in theoretical and selected clinical medical disciplines in order to understand the purpose of technical tool application, ability to assess functionality and ability to create conditions for qualified communication with medical doctors. He/she has wide knowledge of existing information systems and technologies. He/she gains knowledge in the field of management in health care, bioethics, medical ethics and psychology of management. The graduate can successfully apply in all fields of technical and information provision of health care facilities, in institutes and laboratories of biomedical research and development, in the field of information systems and in technical management of mainly health care operations. He/she will also operate as managerial employee in the management of health care facilities, as well as a pedagogue and researcher at universities.

Software skills: C language, HTML, PHP, MATLAB, Simulink, CST-studio suite.

ELECTRIC DRIVES

The graduate has knowledge of operation principles of electro-technical, electronic and mechatronic systems, including their control. The graduate has deep knowledge of mathematics, physics, theoretical electrical engineering, electric machines and other courses of the theoretical background that are further applied and extended in the field of power electrical engineering, programming, computer use and electric drives according to the chosen specialized study programme. He/she knows and can apply theoretical apparatus to solve both steady and transition states in electro-technical systems. He/she has practical experience and skills in laboratory works, knows professional terminology well in foreign language, knows basic economic methods necessary for operation of existing systems and has basic knowledge of law, psychology and quality management. He/she is able to manage teams, communicate, solve problems creatively, make decisions, make conclusions, and think critically and independently. On the base of obtained knowledge he/she can analyse, design and realize particular automated control based on microprocessors, digital signal processors and supervisory control systems. Thanks to this knowledge he/she can perform independently design and construction works, create, assess, realize and evaluate large-scale projects, make concept decisions and control big organization units in the field of automated electric drives. The graduate can work in design, management, constructing and operation of plants, railways, urban mass transport and other organisations of administration, production, operation or repair character.

Software skills: FEMM, MATLAB, OPERA-3D, COMSOL Multiphysics, MS Office, Code Warrior, EAGLE, Altium Desinger, Visual Studio, Python, Step 7, Micro win, WinCC.

ELECTRIC POWER SYSTEMS

The graduate has knowledge in the subjects of theoretical base developed in the field of power and applied electronics, programming and utilisation of computer technology, electric drives, electrical traction, electric power systems, management of electricity transmission systems and information systems in electric power systems, has basic knowledge of economic methods for operation of systems, has knowledge of law, psychology and quality management. The graduate is capable of independent projection, constructional and design works, is able to decide on concept issues and management of large organisational units. The graduate may successfully operate in projecting, management, construction and operation of industrial companies, railways, city public transport, in all areas of electric power

systems, in projection and research institutes and other organisations of administrative, production, operation or repair character.

Software skills: MATLAB, EMTP-ATP, MODES, GE-PSLF, MS OFFICE, PTOLEMY, SICHR, LABVIEW, EAGLE, ASSEMBLER, VISUAL STUDIO, C++, C, RUPLAN.

POWER ELECTRONIC SYSTEMS

Universality of this study programme guarantees very wide application of graduates on the labour market. The acquired knowledge may be applied in the most lucrative areas of electrical engineering, machinery and energetic industry, as well as in transportation. In the future their application in the services field is also expected. These are mainly areas of development, design, projection and application of power and control electronic systems, mechatronic and automotive systems, their control nodes, superior control systems, industrial automatic machines and robots and equipment of industrial automation. With regard to significant representation of subjects oriented to programming and development of control software, the graduate may operate successfully in very interesting jobs. The graduates from this study programme may apply for jobs at companies dealing with projects, production and application of power electronic and/or mechatronic systems and industrial automation. They may successfully apply also in specialised machinery companies working in the fields of automobile industry, chemical and petrochemical industry, gas industry, paper mill and transportation.

Software skills: Freescale ARM, Texas Instruments DSP, ANSI C language, EAGLE, OrCADPSpice, PLECS, LabView, Simulink, COMSOL, VHDL ISE Desing Suite, dSpace, Texas Instruments Education Modules.

PROCESS CONTROL

The graduate gains education in the field of analysis and synthesis of automated control and information systems mainly for the area of information processing and transmission in the control of safety critical processes. Graduates from the study programme Process Control specialize in safe control of transportation process with emphasis on intelligent transport systems and signalling systems. They handle support telematic systems and safe control of industrial processes with emphasis on complex technologies, safe critical production applications, intelligent buildings, security systems for personal and property protection, security of information systems and modern computer networks.

Software skills: Ethernet, PLC, Jazyk PHP, MySQL, Jazyk HTML, UML, Jazyk OCL, MATLAB, Jazyk PYTHON, SCADA/HMI systems.

APPLIED TELEMATICS

The graduate will acquire education in the areas of design, modelling, application, implementation, inspection, service and maintenance of telematics systems and their components, especially intelligent transport systems, control systems of road and railway tunnels, complex transportation systems and telematics systems in health care. He/she will gain theoretical knowledge about sets of technical instruments utilized in selected application areas (primarily in the area of transport, additionally in other areas – health care, public services, etc.) that are required for understanding of telematics systems, their components, modern development trends, position of human factor in these systems as well as knowledge needed for design, control and assessment of those systems.

Software skills: Ethernet, PLC, PHP language, MySQL, HTML language, UML, OCL language, MATLAB, PYTHON language, SCADA/HMI systems.

PHOTONICS

The application of graduates has close connection especially with telecommunications, information technologies, medicine, industrial technologies, aeronautics, military technologies, and civil engineering as well as in consumer goods and entertainment industry. The graduate should know to creatively, analytically and in details orient in the following technical areas: design, modification and testing of laser equipment and components for telecommunications, medicine and for other purposes; utilization and enhancing quality and design of optical fibres technologies; development and testing of optical, photonic or imaging prototypes and equipment; design of electro-optical sensor systems; application of new photonic technologies and equipment into different industrial areas; optical design of standard lighting; definition of commercial, industrial or scientific utilization of electro-optical applications; creation, analysis and testing of optical fibres lines.

Software skills: Code Block (C, C++), LabView.

TELECOMMUNICATION AND RADIOCOMMUNICATION ENGINEERING

The education is focused on the topic of telecommunication and information networks with direction on digital communication networks, i.e. optic and metallic systems and networks, intelligent networks, terrestrial mobile networks, microwave radio and satellite communication, network management, architecture of signalling systems and communication protocols, applications of multimedia and multimedia services, reliability and diagnostics of systems and networks. The graduate will successfully apply as a creative employee in research, technical development, telecommunication design and management, as well as in all fields of applications of telecommunication, radiocommunication and information and communication technologies and services.

Software skills: ADOBE, HTML, PHP, MySQL, Blender, 3dMax, Cinema 4D, Android, JAVA, Microsoft Direct3D, OpenGL, MATLAB, After Effect, ZScan, Geomagic, MS Office, MATLAB, SIMULINK, from SPICE family – simulation programs oriented in analyses and syntheses of electronic circuits, VPIphotonics, ASEMBLER.

MULTIMEDIA ENGINEERING

The student of the Multimedia Engineering study programme in the telecommunications field of study will enhance his/her knowledge to the necessary extent in the subjects of theoretical base of the field of study and gain detailed knowledge of media communication, networks and services, their convergences and also their securities. By selection of optional subjects he/she may more closely specialize in the field of processing image, graphic or audio information. A significant element of knowledge is understanding of web technologies, mainly as far as the design of web services is concerned, knowledge of 2D and 3D graphic and animation systems and applications and digital processing of the multimedia contents. Student of this study will also acquire knowledge of aesthetics and creative attitude in the design of multimedia products, legal regulations in the field of electronic communication, their management, economics and marketing. The graduate from master study will be able to specialise and to adapt to different levels depending on the needs of practice, research and development, as well as the ability of permanent knowledge enhancement in the field. Students will obtain knowledge and skills that enable them to work independently as well as in teams in solving projects integrating the technical and creative level into one, or even to lead such teams.

Software skills: ADOBE, HTML, PHP, MySQL, Blender, 3dMax, Cinema 4D, Android, JAVA, Microsoft Direct3D, OpenGL, After Effect, ZScan, Geomagic, MS Office, MATLAB, SIMULINK, from SPICE family – simulation programs oriented in analyses and syntheses of electronic circuits.

DOCTORAL STUDY PROGRAMMES

ELECTRIC POWER SYSTEMS, ELECTRO-TECHNOLOGIES AND MATERIALS, PROCESS CONTROL, POWER ELECTRICAL ENGINEERING, TELECOMMUNICATIONS, THEORY OF ELECTRICAL ENGINEERING

The graduates will gain in-depth theoretical knowledge based on the state-of-the-art scientific knowledge in the areas that are directly related to their scientific work, they will contribute to their development as well as new findings in the respective fields by their own creative activity. They will acquire practical abilities and skills by working on complex experimental equipment and computer systems, in processing results, preparation and presentation of reports on research results. They will gain experience in formulating partial research tasks and management of the team during the solution of tasks.

REGISTRATION PROCEDURE FOR EXCHANGE STUDENTS

The application procedure varies depending on the exchange programme. Students wanting to study at the Faculty of Electrical Engineering of the University of Žilina within some exchange programme should contact responsible person at their home university. There they will be provided with basic information about agreement between universities, formalities that are to be completed and other useful information.

APPLICATION PROCEDURE FOR INCOMING ERASMUS+ STUDENTS

Ask the international office of your university if there is signed an Erasmus+ bilateral agreement with the Faculty of Electrical Engineering of the University of Žilina. Students wanting to study at the Faculty of Electrical Engineering of the University of Žilina within the Erasmus+ programme must be nominated by their home university.

The main issues connected with registration are as follows:

1. All students incoming to the Faculty of Electrical Engineering have to complete the following procedures for the academic year starting in September:
 - LEARNING AGREEMENT must be filled in, signed and stamped. Learning agreement must be elaborated and agreed by three parties involved – student, the home institution and the host institution.
 - Scanned copy of Learning agreement must be signed by your home Erasmus+ coordinator and sent by e-mail together with Transcript of records before our deadlines to the following e-mail address: silvia.pirnikova@fel.uniza.sk.

Application deadlines:

15 June for autumn semester

30 November for spring semester

2. Normally, all courses at the Faculty are taught in Slovak. Some of them can also be in English. These are listed in the part *Summary of courses*. Many courses can be accomplished by “self-learning” method”, in which *the lectures are replaced by learning from recommended literature and individual consultations with a teacher* (foreign students don't usually attend courses together with Slovak students). Incoming students are asked to have a good level of proficiency in English.
3. Financial outlay required from students for study:
Teaching and all other procedures connected with studies are free of charge.

For further information about the registration procedure for ERASMUS+ study stays at the FEE, including the documents, visit the [Faculty's web site](#).

Faculty of Electrical Engineering cooperates with the ESN UNIZA organization
<http://esn.uniza.sk> - Erasmus student network that provides help for incoming foreign students and prepares various events for them during their stay.

ESN UNIZA main activities:

- a pick-up at the train or bus station,
- basic orientation in the city, including showing the dorms, school buildings, dining hall, library, etc.,
- assistance with the formal documents such as school ID or public transport pass.

GENERAL PRACTICAL INFORMATION

Visa obligation (detail and accurate information can be obtained from the Ministry of Foreign Affairs of his/her country, or at its consulates)

Depending on the country you come from and the reason you come to Slovakia for, you may need an ID card, a passport or even a visa in order to enter Slovakia.

Students of third countries staying in Slovakia longer than 90 days have to apply for temporary residence permit for the purpose of studies. You have to apply in person at the foreign police department at the street Bánovská cesta 8111, Žilina, in the office hours (Monday 7.30 – 12.00, 12.30 – 15.00; Wednesday 7.30 – 12.00, 12.30 – 17.30; Friday 7.30 – 12.00). The foreign police communicate in Slovak only, so if you think that you won't be able to communicate with them somehow, have somebody to go with you.

Please bear in mind that you have to apply for visa in person at the Slovak embassy/consulate competent for your country before your arrival to Slovakia. Useful information about VISA can be found here:

<http://www.euraxess.sk/en/main/services-practical-information/guide/>

At the foreign police department in Žilina you have to submit a complete application, otherwise they won't accept it. Complete application consists of the following documents:

1. application form (available on web page http://www.mzv.sk/sk/cestovanie_a_konzularne_info/cestovne_doklady_a_viza-vizove_formulare); it has to be filled in Slovak language)
2. 2 full-face colour photographs 3x3.5 cm
3. passport (validity of at least 3 months longer than the expected validity for the visa; you just have to show it, they won't keep it)
4. confirmation of studies from your host university in Slovak language (as proof of purpose)
5. document in Slovak showing sufficient financial security - e.g. letter of award stating the amount of your scholarship (your university can give you some confirmation about your scholarship in English and the host university will make a new document for the Foreign police in Slovak language)
6. confirmation about the accommodation – will be issued by the Dormitory
7. listing from your criminal record with apostille and translated by an official sworn translator (list of translators from can be found at http://jaspi.justice.gov.sk/jaspiw1/htm_req/jaspiw_mini_regt_vyber_hl1.asp?clear=Y&cball=Y&oddiel=pr, but it is available in Slovak only) from your country of origin **and** every country where you have stayed more than 90 days within last 3 years (if any).

The documents cannot be older than 90 days!

Fees for visa application: 60€

Fee for the issue of a residence card: duty stamps in the value of 4.50€ (you can buy it at every post office)

Students of EU/ European Economic Area/ Switzerland staying in Slovakia longer than 119 days have to register within 30 day (at the latest!!!) before the expiry of these 119 days from the entry into the SR (that means after 90 days) at the foreign police. The application consists of the following documents:

1. application form (available on web page www.minv.sk/?pobyt-cudzinca; it has to be filled in Slovak language)
2. personal identification card / passport
3. confirmation of studies from your host university in Slovak language (as proof of purpose)

The officer will also ask you to provide a mobile phone number where they can send you a text message that your residence permit is ready. You can write the number on your application form. They should give you a confirmation that they received the application. Within 30 days since accepting the application you will be informed if you have been granted the residence permit.

When you get your residence permit, they will ask you to provide within 30 days from collecting the residence card a proof of health insurance coverage in Slovakia (document must be in Slovak). Moreover, the student has to provide within 30 days a medical certificate that you don't suffer from any exotic disease threatening the public health. The certificate can't be older than 30 days. The medical certificate can be obtained in some medical centres only and please be prepared that it is quite costly. Contacts to the main eligible medical centres are provided here:

- Institute of Travel Medicine and Vaccination Ltd., ŽILPO, s.r.Ltd., Vysokoškolákov 31, Žilina, mobile: +421 917 131479, bakos@inocem.sk , www.inocem.sk;
- Martin Faculty Hospital, Infectious Diseases, Outpatient for exotic diseases, Kollárova 2, Martin, telephone 043/4131680
- Exotic Diseases Clinic, Velvet Ltd., Americké námestie 3, Bratislava, telephone 02/52925688, 52962732
- Faculty Hospital Louis Pasteur in Košice, Rastislavova 43, Košice, telephone 055/6152204, 6225251-5
- Faculty Hospital Nitra, Špitálska 6, 950 01, Nitra, telephone 037/6545579.

Prices for the medical certificate vary depending upon the medical centre. Contact the particular centre for precise information. (Count with 112-269€)

The Slovak Republic

The Slovak Republic (Slovakia in short form) is a landlocked country in Central Europe with a population of over five million and an area of about 49,000 square kilometres (19,000 sq mi). It borders the Czech Republic and Austria to the west, Poland to the north, Ukraine to the east and Hungary to the south. The largest city is its capital, Bratislava. Slovakia is a member state of the European Union, NATO, UN, OECD, WTO, UNESCO and other international organizations. On the 1st of January 2009, 5 years after joining EU, Slovakia adopted Euro as its official currency.



The Slavs arrived in the territory of present day Slovakia between the fifth and sixth centuries AD during the Migration Period. In the course of history, various parts of today's Slovakia belonged to Samo's Empire (the first known political unit of Slavs), Great Moravia, Kingdom of Hungary, the Austro-Hungarian Empire or Habsburg Empire, and Czechoslovakia. An independent Slovak state was created for a brief period during World War II, during which Slovakia was a dependency of Nazi Germany 1939-1944. From 1945 Slovakia once again became a part of Czechoslovakia. The present-day Slovakia became an independent state on January 1, 1993 after the dissolution of its federation with the Czech Republic. Since then, the political system of both states is parliamentary democracy and the first day of the year became a national holiday.



Interesting links:

<http://www.slovak-republic.org/>

<http://www.slovakia.org/>

<http://www.slovakia.com/>

http://www.tourist-channel.sk/new_page_eng/tourist1.php3

The City of Žilina



Žilina is a city in north-western Slovakia, around 200 kilometres (120 mi) from the capital Bratislava. It is the fourth largest city of Slovakia with a population of around 85,000, an important industrial centre, the largest city on the Váh river, and the seat of a Žilina Region and of a Žilina District.

Its importance was determined by the strategic position on the confluence of three rivers in the valley of the river Váh. The city is located in the middle of beautiful mountains, which makes it a starting point to many areas. The first writing about the area dates from 1208. In 1312, Žilina was already a city.

In 1381, Slovaks living here acquired equal status with German colonists. The declaration "Privilegium pro Slavis" was edited by Ludwig 1st from Anjou during his visits to our city. The Žilina Domesday Book is also an important legal and linguistic document. Its seals date from 1378. In the following centuries, Žilina was an important centre of craftsmen, commerce and education. The construction of railroads at the end of the XIX century was of great importance for the development of the city. Žilina became an important railway junction in the area. A number of big industrial companies were established there.

The city acquired a greater significance after the formation of the Slovak Republic in 1993. A new impulse for further development of the city was the establishment of the county of Žilina in 1996. Žilina with its economic, cultural and educational potential has always been

the centre of north-western Slovakia. There are a lot of industry and construction companies. Žilina has a rich past, dynamic present and all conditions for all-round development in the future.

Getting to Žilina

The city of Žilina has excellent train and bus connections with many cities. When flying, you may arrive at the following airports with convenient connections to Žilina:

- Vienna International Airport (Austria), which is situated about 50 kilometres from Bratislava, capital of the Slovak Republic. The airport has a regular bus connection with Bratislava's bus station (about a 50-minute bus ride). Then take a direct train to Žilina (200 kilometres, about a 2-hour and 40-minute train ride).
- Prague Airport (Czech Republic). Take a direct train to Žilina (450 kilometres, about a 7-hour train ride).
- Bratislava Airport and then direct train to Žilina.
- Žilina airport (flights via Prague from other European cities) is situated few kms from the city of Žilina.

Local Transport

Žilina has a relatively efficient public transport system that includes buses and trolley buses with a satisfactory coverage area and time density around the clock. A single fare is as cheap as 0,65 or 0,55 EUR; student seasonal tickets are also sold at reasonable prices.

Students can choose between student and normal ticket. For student ticket students are obliged to have a valid Slovak student card (our ESN student organization will help you to obtain one after your arrival). We distinguish between 1 zone tickets and 2 zones tickets. One zone ticket is valid only up to 5 bus stops and 2 zones ticket is valid for unlimited number of stops. Both cases are valid only for one single bus ride (you can not change bus without buying a new ticket). The bus tickets can be bought at kiosk at the bus stop, in the ticket vednor (also at the bus stop) and at the driver's (for higher prices).

Find timetable of buses and trolley buses can be found on web pages <http://www.dpmz.sk> and <http://www.imhd.sk/za/>.

Study Facilities at the University of Žilina

Study at the University of Žilina is fully supported by the following learning resources: the University Library, University Intranet and Slovak Academic Data Network with access to the World Wide Web. In addition, the University operates editorial and computer facilities, which provide services to prepare presentations, diploma works, etc.

The University Library is the central study and information centre of the University. It makes primary and secondary informational resources accessible and co-ordinates services from other institutions and database



centres. Direct access to information via the Internet enables remote users to access electronic catalogues and entry into national and foreign academic libraries and other information centres.

Departmental libraries are well equipped with books, journals and other study facilities more closely oriented to particular fields of study.

Accommodation

All students can use accommodation in student residences, situated in the University Campus. The monthly payment there is between 99 - 135 €/per month/per person. Two or three students share the fully equipped rooms (including bed linen). Students also have to pay the deposit at the time of their arrival which is 130,- EUR. This deposit of 130 EUR will be given back to the student at the end of the stay - in case the student doesn't do any harm at the Dormitory. Students will also be asked to pay 25 EUR for using the kitchen.

Several refectories and cafeterias offer breakfast, lunch and dinner at very modes price (about 2 EUR per meal).

There are two accommodation facilities that are located at Velky diel and Hliny V. with free parking. Foreign students from the Faculty of Electrical Engineering are mostly located in Dormitory Velky Diel which is closer to University - around 10 mins by walking.

Buildings A-B-C-D: two-/three-bed rooms. There are common lavatories and showers on each floor. Each floor has a kitchenette. The rooms located in the B part have internet access. Other rooms in the parts A-C-D have wireless internet access.

Buildings E-F and G-H: three-bed rooms, lavatory and shower in each room. There is a kitchen on each floor. All the rooms located in these parts have internet access.

There are also television rooms, conference rooms, and a cinema room for approximately 180 persons (movie projection, conferences, lectures, rehearsals, workshops), study rooms, laundry, kitchenettes, GP surgery, dentist, hairdresser. Free parking provided.

Some information about the accommodation you can find in English on web page <http://www.iklub.sk/?lang=en&q=ubytko>.

Address:
Veľký diel
Ul. Vysokoškolákov
010 08 Žilina
Tel.: +421-41-565 25 07,
513 1470
<http://vd.internaty.sk/>



Catering

You can get your meal using your ISIC card, which is registered in the database of Credit users.

Before first use, the ISIC card must be activated in the box-office New Menza and you have to raise your credit. You can activate booking of meals via internet too, at the address <http://strava.uniza.sk> - you will be assigned a username and password, which can be changed later.

Box office is open from 10:00am to 1:00pm at business days (to 1:30pm on Friday and to 1:00pm at weekends), automat works non-stop. You can get your lunch from 11:00am to 2:00pm, and dinner from 2:00pm to 7:00pm. The dinners are not cooked on weekends.

Meals for students are served in the student's canteens or in snack bars which are parts of the accommodation facilities or are located within the campus.

The student's canteen operates on the basis of the information system KREDIT 7 which enables automatic ordering and taking meals through a smart card. Students can choose from the week's offering eight different choices. Catering services are provided:

- from Monday to Thursday: 11.00 a.m. to 7.00 p. m.,
- on Friday from 11.00 a.m. to 1.30 p. m.
- and on Saturday and Sunday from 11.00 a. m. to 1.00 p. m.

Meals are served in the following places:

- Students canteens New Menza and Old Menza
- Canteens in the following buildings (Rectors office, Faculty of Special Engineering, Faculty of Management Science and Informatics).

Several snackbars can be found in the area of Veľký diel (Bufet Klub, Bufet NR, Bufet rektorát, Alammo, Paladeo, Nasa Slovakia, Café Beta, café Paľova Búda) and in the area of Hliny V (Café K2, Bufet Stará Menza, Café Stará Menza).

Health and Insurance

The City of Žilina provides a wide range of health-care services from general practitioners to a regional hospital, with full medical facilities. The general practise and dentist's surgeries for students are located o the University Campus. Address: Veľký diel, Blok G-H.

Incoming students coming to Žilina should arrange their insurance in advance in their home countries. Supplementary travel insurance as also recommended. A full range of insurance services is available in Žilina.

Emergency services/numbers:

158	Police
150	Fire brigade
155	Medical first aid
1181	Information on phone numbers
112	Police, fire brigade, medical first aid, mountain rescue system

Bank Holiday

1 January - Day of the Establishment of the Slovak
6 January - Epiphany
1 May - Labour Day
8 May - Victory over Fascism Day
5 July - St. Cyril and Methodius Holiday
29 August - Slovak National Uprising
1 September - Constitution Day
15 September - Our Lady of Sorrows
1 November - All Saints Day
17 November - Fight for Freedom and Democracy
24 December - Christmas Eve
25 December - Christmas Day
26 December - Second Day of Christmas

Leisure Activities

The city of Žilina offers a wide range of cultural, sports and other leisure activities.

Cultural activities include museums, galleries, exhibitions, theatres and cinemas. Also, shopping facilities, restaurants, cafes and pubs are spread throughout the city.

Sporting opportunities include summer and winter sports and different indoor options, such as swimming pool, fitness, sauna and solarium, ice-hockey stadium and gymnasiums, many of which are operated by the University's Institute of Physical Education. The surrounding mountains (within a 10- to 30-kilometer distance) offer all the opportunities for skiing and snowboarding in winter and mountain walking and climbing during the warmer months.



A Few Words in Slovak

For more useful vocabulary look at www.slovakiasite.com/useful-vocabulary.php

In English	In Slovak	In English	In Slovak
Good afternoon	Dobrý deň	What's your name?	Ako sa voláš?
Hello	Ahoj	My name is Martin.	Volám sa Martin.
Yes	Áno	Friend	priateľ (m)/ priateľka (f)
No	Nie	Mr.	Pán
Thank you	Ďakujem	Mrs.	Pani
Please	Prosím	Miss	Slečna
Sorry	Prepáč	How are you?	Ako sa máš?
You are welcome	Prosím	I am fine, thank you.	Ďakujem, mám sa dobre.
Not at all	Niet za čo	I am from Bratislava.	Ja som z Bratislavy.
Help	Pomoc	Do you speak English?	Hovoríte anglicky?
Welcome	Vitaj. Vitajte	Little bit.	Trochu.
OK	Dobre	Nice to meet you.	Teší ma.
Never mind	To nevádí	How much does it cost?	Koľko to stojí?
My pleasure.	Rado sa stalo.	What's the time?	Koľko je hodín?
Train	Vlak	Monday	Pondelok
Bus	Autobus	Tuesday	Utorok
Toilet	Toaleta	Wednesday	Streda
Airport	Letisko	Thursday	Štvrtok
Car	Auto	Friday	Piatok
Bon appétit.	Dobrá chuť.	Saturday	Sobota
Congratulations!	Gratulujem!	Sunday	Nedeľa
Shop	Obchod	Doctor	Lekár
Coffee	Káva	Ambulance	Sanitka
Tea	Čaj	Emergency	Pohotovosť
Water	Voda	Hospital	Nemocnica
Salt	Soľ	Pharmacy	Lekáreň
Sugar	Cukor	Dentist	Zubár
Bread	Chlieb	Pain	Bolesť

Summary of courses offered for Erasmus+ exchange students and other foreign students

Code / Title of Course	Credits	Study programme	Degree	Year/Semester
3B0103 Introduction to Physics	5	All study programmes	Bc	1./1.
3B0102 Algorithmisation and programming	6	Automation	Bc.	1./1.
3B0101 Electrical Circuits 1	6	All study programmes	Bc.	1./1.
3B0202 Physics 1	7	All study programmes	Bc	1./2.
3B0203 Programming in C++	5	Automation	Bc.	1./2.
3B0201 Electrical Circuits 2	5	All study programmes	Bc.	1./2.
3B0204 Measurement and Measuring Systems	5	All study programmes	Bc.	1./2.
3B0212 Communication technologies 1	5	Telecommunications Multimedia Technologies	Bc.	1./2.
3B0207 Enterprise management and economy	2	Electrical Engineering	Bc.	1./2.
31303 Physics 2	5	All study programmes	Bc	2./1.
31307 Computer Modelling of Real Processes	3	All study programmes	Bc	2./1.
3B0304 Theory of information and signals	5	Automation	Bc.	2./1.
3B1300 Information and communication networks	3	Automation	Bc.	2./1.
3B0301 Electrical Circuits 3	7	All study programmes	Bc.	2./1.
3B0302 Electronics 1	5	All study programmes	Bc.	2./1.
3B2300 Autotronics	5	Autotronics	Bc.	2./1.
Simulation languages in power electronics	4	All study programmes	Bc.	2./1.
3B0314 Logical Circuits	5	Telecommunications	Bc.	2./1.
3B0316 Communication technologies 2	5	Telecommunications Multimedia Technologies	Bc.	2./1.
3B7402 Communication technologies 3	5	Telecommunications	Bc.	2./1.
3B0310 Introduction to signals and systems	4	Telecommunications Multimedia Technologies	Bc.	2./1.
3B1400 Theory of automatic control	6	Automation	Bc.	2./2.
3B1402 Distributed control systems	6	Automation	Bc.	2./2.
3B1403 Sensor Technology	6	Automation	Bc.	2./2.
3B0401 Technical Background of Computers	3	Automation	Bc.	2./2.
3B3401 Electromagnetic Field	6	Biomedical Engineering	Bc.	2./2.
3B3400 Sensors and Measuring Methods in Biomedicine	5	Biomedical Engineering	Bc.	2./2.
3B3402 Programming Languages- MATLAB	5	Biomedical Engineering	Bc.	2./2.
3B0400 Electronics 2	5	All study programmes	Bc.	2./2.
3B0406 Microprocessor systems	6	Autotronics	Bc.	2./2.
3B0407 Mechatronics	6	Autotronics	Bc.	2./2.
3B0414 Optics for photonics	5	All study programmes	Bc.	2./2.
3B0409 Transmission media	5	Multimedia Technologies	Bc.	2./2.
3B7400 Analog circuit systems 1	5	Telecommunications	Bc.	2./2.
3B0408 JAVA - language and applications development	5	Telecommunications Multimedia Technologies	Bc.	2./2.
3B7404 Computer networks 1	5	Telecommunications	Bc.	2./2.
3B6402 Studio technology	5	Multimedia Technologies	Bc.	2./2.

3B0405 Electrical machines	7	Electrical Engineering	Bc.	2./2.
3B0415 Design of electrical wiring	6	Electrical Engineering	Bc.	2./2.
3B5402 Introduction to electric drives	6	Electrical Engineering	Bc.	2./2.
3B5404 Electrical machines in English 1	3	Electrical Engineering	Bc.	2./2.
31521 Communications Security	6	Automation	Bc.	3./1.
31534 Single-chip controllers programming	6	Automation	Bc.	3./1.
31536 Sensor Technology	6	Automation	Bc.	3./1.
31213 Design and Construction of Medical Devices	5	Biomedical Engineering	Bc.	3./1.
31543 Wave Processing in Medicine	5	Biomedical Engineering	Bc.	3./1.
31513 Sensors in Technology	6	Electrical Engineering	Bc.	3./1.
Sensors and Actuators	6	Autotronic	Bc.	3./1.
31502 Power electronics	6	Electrical Engineering	Bc.	3./1.
31511 Microprocessor technology	6	Electrical Engineering	Bc.	3./1.
31528 Multimedia technology	3	Electrical Engineering	Bc.	3./1.
31552 Computer and office technology	3	Electrical Engineering	Bc.	3./1.
31556 Mechatronics	6	Electrical Engineering	Bc.	3./1.
31112 Introduction to photonics	4	All study programmes	Bc.	3./1.
3B0507 Electroacoustic	5	Multimedia Technologies	Bc.	3./1.
31313 Television technology	5	Multimedia Technologies	Bc.	3./1.
3B0510 Design of multimedia WEB pages 1	5	Multimedia Technologies	Bc.	3./1.
31431 Vector graphic and typography	5	Multimedia Technologies	Bc.	3./1.
3B7501 Analog circuit systems 2	6	Telecommunications	Bc.	3./1.
3B7504 Computer networks 2	5	Telecommunications	Bc.	3./1.
3B7503 Radiocommunication systems	4	Telecommunications	Bc.	3./1.
3B0506 Electrical apparatus	6	Electrical Engineering	Bc.	3./1.
3B0508 Electricity generation	6	Electrical Engineering	Bc.	3./1.
3B5500 Electricity transmission	6	Electrical Engineering	Bc.	3./1.
3B5504 Electric traction 1	6	Electrical Engineering	Bc.	3./1.
3B0506 Electric drives 1	6	Electrical Engineering	Bc.	3./1.
3B5502 Selected topics of electrical machines	6	Electrical Engineering	Bc.	3./1.
3B5506 Electrical machines in English 2	3	Electrical Engineering	Bc.	3./1.
3B5507 Application of digital signal controllers 1	3	Electrical Engineering	Bc.	3./1.
31623 Control Systems Programming	5	Automation	Bc.	3./2.
31563 Electronic Devices Design	4	Electrical Engineering	Bc.	3./2.
31628 Power semiconductor systems	6	Electrical Engineering	Bc.	3./2.
31113 Introduction to fibre optics	5	All study programmes	Bc.	3./2.
3B0607 Quality management	4	Electrical Engineering	Bc.	3./2.
3B0606 Electric drives 2	6	Electrical Engineering	Bc.	3./2.
3B0609 Design Fundamentals in Power Systems	2	Electrical Engineering	Bc.	3./2.
3B5607 Applications of Digital Signal Controllers 2	3	Electrical Engineering	Bc.	3./2.
3I0101 Advanced Methods of Automatic Control	7	Process Control Applied Telematics	MSc.	1./1.
3I0102 Communication Networks	6	Process Control Applied Telematics	MSc.	1./1.

310103 Theory of signal processing in process control	6	Process Control Applied Telematics	MSc.	1./1.
310104 Elements in railway signalling systems	6	Process Control Applied Telematics	MSc.	1./1.
317100 Control systems with safety PLC	6	Process Control	MSc.	1./1.
312100 Medical Electronics	7	Biomedical Engineering	MSc.	1./1.
312101 Modelling and Simulation of Electronic Circuits and Systems in Biomedicine	6	Biomedical Engineering	MSc.	1./1.
312102 Compatibility of Biological and Technical Systems	6	Biomedical Engineering	MSc.	1./1.
310114 Electromagnetic Field Modelling	5	Power Electronic Systems Telecommunication and Radiocommunication Engineering	MSc.	1./1.
319101 Digital Measuring Devices and Systems	5	Power Electronic Systems	MSc.	1./1.
315100 Physics of materials and structures	6	All study programmes	MSc.	1./1.
315101 Photonics	6	All study programmes	MSc.	1./1.
315103 Modelling and simulation in photonics	5		MSc.	1./1.
316101 Radiocommunication networks (RS)	5	Multimedia Engineering	MSc.	1./1.
310112 Signals and communication systems	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	1./1.
318104 Electromagnetic Wave Propagation and Antennas	6	Telecommunication and Radiocommunication Engineering	MSc.	1./1.
316103 Room acoustics	5	Multimedia Engineering	MSc.	1./1.
316104 Multimedia WEB pages design	5	Multimedia Engineering	MSc.	1./1.
310108 Microprocessors, microcomputers & DSP	7	Power Electronic Systems	MSc.	1./1.
319102 Computers in industrial automation 2	5	Power Electronic Systems	MSc.	1./1.
319103 Vehicle Motion Dynamics	5	Power Electronic Systems	MSc.	1./1.
319105 Simulation Tools in Power Electronics	5	Power Electronic Systems	MSc.	1./1.
313101 Control of electric drives 1	6	Electric Drives	MSc.	1./1.
313100 Analysis of electrical machines	6	Electric Drives	MSc.	1./1.
314101 Transients in power systems	7	Electric Power Systems	MSc.	1./1.
314102 Power plants	6	Electric Power Systems	MSc.	1./1.
314103 Electric Substations	6	Electric Power Systems	MSc.	1./1.
310201 Safety-related system communication (BSK)	6	Process Control Applied Telematics	MSc.	1./2.
310202 Analysis of control system safety (ABRS)	7	Process Control Applied Telematics	MSc.	1./2.
310203 Artificial intelligence 1	5	Process Control Applied Telematics	MSc.	1./2.
310204 Applications of Higher Programming Languages (AVPJ)	6	Process Control Applied Telematics	MSc.	1./2.
310205 Railway signalling systems	6	Process Control Applied Telematics	MSc.	1./2.
312200 Information Systems in Medicine	6	Biomedical Engineering	MSc.	1./2.
312201 Technical Means for Medicine	7	Biomedical Engineering	MSc.	1./2.
312202 Acquisition and Analysis of Biopotentials	6	Biomedical Engineering	MSc.	1./2.
312203 Artificial Intelligence in Biomedicine	6	Biomedical Engineering	MSc.	1./2.

312204 Fundamentals of Ecology	5	Biomedical Engineering	MSc.	1./2.
315200 Semiconductor and semiconductor structures	6	All study programmes	MSc.	1./2.
315201 Sources and detectors of radiation	6	All study programmes	MSc.	1./2.
310218 Optical sensors	5	All study programmes	MSc.	1./2.
315202 Waveguide optics	6	All study programmes	MSc.	1./2.
316203 WEB applications design	6	Multimedia Engineering	MSc.	1./2.
316200 Digital television and New Services	6	Multimedia Engineering	MSc.	1./2.
316204 3D applications design	6	Multimedia Engineering	MSc.	1./2.
318201 Radiocommunication systems and networks 1	6	Telecommunication and Radiocommunication Engineering	MSc.	1./2.
318200 Higher programming languages	6	Telecommunication and Radiocommunication Engineering	MSc.	1./2.
310214 Digital audio processing	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	1./2.
310215 Discrete signals processing	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	1./2.
318202 Photonic Communication Systems	6	Telecommunication and Radiocommunication Engineering	MSc.	1./2.
310210 Power semiconductor converters	7	Power Electronic Systems	MSc.	1./2.
310217 Integrated Circuits Design	5	Power Electronic Systems	MSc.	1./2.
310212 Traction batteries and charging infrastructure	6	Power Electronic Systems	MSc.	1./2.
310219 Virtual instrumentation	6	Power Electronic Systems	MSc.	1./2.
319200 Analyse and Synthese od Power Electronic Circuits	6	Power Electronic Systems	MSc.	1./2.
319201 Mechatronic systems	6	Power Electronic Systems	MSc.	1./2.
310211 Electrical machines for special purposes (ŠES)	6	Electric Drives	MSc.	1./2.
313200 Control of electric drives 2 (REP2)	6	Electric Drives	MSc.	1./2.
310213 Power system modelling	4	Electric Power Systems	MSc.	1./2.
314200 Power system control	8	Electric Power Systems	MSc.	1./2.
314201 Renewable energy sources	6	Electric Power Systems	MSc.	1./2.
314202 Protective relaying	7	Electric Power Systems	MSc.	1./2.
313203 Electric Traction	6	Electric Drives	MSc.	1./2.
310318 Object oriented system development	7	Process Control	MSc.	2./1.
310302 Application of railway signalling systems	6	Process Control	MSc.	2./1.
310115 Security of information systems	6	Process Control	MSc.	2./1.
310300 Artificial intelligence 2	7	Process Control Applied Telematics	MSc.	2./1.
312300 Biomedical Image Processing	6	Biomedical Engineering	MSc.	2./1.
312301 Signal Processing in Medicine	7	Biomedical Engineering	MSc.	2./1.
310312 Laser and laser systems	6	All study programmes	MSc.	2./1.
310309 Applied optics and light technique	6	All study programmes	MSc.	2./1.
316300 Distribution of Multimedia Signals	4	Multimedia Engineering	MSc.	2./1.

318301 Radiocommunication systems and networks 2	6	Telecommunication and Radiocommunication Engineering	MSc.	2./1.
318306 Microwave systems	8	Telecommunication and Radiocommunication Engineering	MSc.	2./1.
310308 Digital image processing	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	2./1.
319300 Design and Construction of Power Electronic Systems	8	Power Electronic Systems	MSc.	2./1.
319303 Electric transfer of HEV and EV vehicles power	5	Power Electronic Systems	MSc.	2./1.
319304 Power Electronics Applications	5	Power Electronic Systems	MSc.	2./1.
Logic circuits	5	Power Electronic Systems	MSc.	2./1.
319306 Control systems of EV and HEV vehicles	5	Power Electronic Systems	MSc.	2./1.
314301 Power System Calculations	6	Electric Power Systems	MSc.	2./1.
314302 Information systems for power system control and monitoring	5	Electric Power Systems	MSc.	2./1.
313300 Sensorless control of electric drives	7	Electric Drives	MSc.	2./1.
313301 Discrete control of electric drives (DREP)	7	Electric Drives	MSc.	2./1.
310401 Automatic identification	5	Process Control	MSc.	2./2.
310402 Security Systems	6	Process Control	MSc.	2./2.
32338 Robotic systems	5	Process Control	MSc.	2./2.
315301 Integrated optics and optoelectronics	5	All study programmes	MSc.	2./2.
310409 Trends in Information and Communication Technologies	3	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	2./2.
310407 Discrete control of power systems	6	Power Electronic Systems	MSc.	2./2.
319403 Economic aspects of electromobility	6	Power Electronic Systems	MSc.	2./2.

Code / Title of Course	Credits	Study programme	Degree	Year/Semester
3B0103 Introduction to Physics	5	All study programmes	Bc	1./1.
3B0102 Algorithmisation and programming	6	Automation	Bc.	1./1.
3B0101 Electrical Circuits 1	6	All study programmes	Bc.	1./1.
3B0202 Physics 1	7	All study programmes	Bc	1./2.
3B0203 Programming in C++	5	Automation	Bc.	1./2.
3B0201 Electrical Circuits 2	5	All study programmes	Bc.	1./2.
3B0204 Measurement and Measuring Systems	5	All study programmes	Bc.	1./2.
3B0207 Enterprise management and economy	2	Electrical Engineering	Bc.	1./2.
3B0212 Communication technologies 1	5	Telecommunications Multimedia Technologies	Bc.	1./2.
31303 Physics 2	5	All study programmes	Bc	2./1.
31307 Computer Modelling of Real Processes	3	All study programmes	Bc	2./1.
3B0304 Theory of information and signals	5	Automation	Bc.	2./1.
3B1300 Information and communication networks	3	Automation	Bc.	2./1.
3B0301 Electrical Circuits 3	7	All study programmes	Bc.	2./1.

3B0302 Electronics 1	5	All study programmes	Bc.	2./1.
3B2300 Autotronics	5	Autotronics	Bc.	2./1.
Simulation languages in power electronics	4	All study programmes	Bc.	2./1.
3B0316 Communication technologies 2	5	Telecommunications Multimedia Technologies	Bc.	2./1.
3B7402 Communication technologies 3	5	Telecommunications	Bc.	2./1.
3B0310 Introduction to signals and systems	4	Telecommunications Multimedia Technologies	Bc.	2./1.
3B1400 Theory of automatic control	6	Automation	Bc.	2./2.
3B1402 Distributed control systems	6	Automation	Bc.	2./2.
3B1403 Sensor Technology	6	Automation	Bc.	2./2.
3B0401 Technical Background of Computers	3	Automation	Bc.	2./2.
3B3401 Electromagnetic Field	6	Biomedical Engineering	Bc.	2./2.
3B3400 Sensors and Measuring Methods in Biomedicine	5	Biomedical Engineering	Bc.	2./2.
3B3402 Programming Languages- MATLAB	5	Biomedical Engineering	Bc.	2./2.
3B0400 Electronics 2	5	All study programmes	Bc.	2./2.
3B0406 Microprocessor systems	6	Autotronics	Bc.	2./2.
3B0407 Mechatronics	6	Autotronics	Bc.	2./2.
3B0405 Electrical machines	7	Electrical Engineering	Bc.	2./2.
3B0415 Design of electrical wiring	6	Electrical Engineering	Bc.	2./2.
3B5402 Introduction to electric drives	6	Electrical Engineering	Bc.	2./2.
3B5404 Electrical machines in English 1	3	Electrical Engineering	Bc.	2./2.
31114 Optics for photonics	5	All study programmes	Bc.	2./2.
3B0409 Transmission media	5	Multimedia Technologies	Bc.	2./2.
3B7400 Analog circuit systems 1	5	Telecommunications	Bc.	2./2.
3B0408 JAVA - language and applications development	5	Telecommunications Multimedia Technologies	Bc.	2./2.
3B7404 Computer networks 1	5	Telecommunications	Bc.	2./2.
3B6402 Studio technology	5	Multimedia Technologies	Bc.	2./2.
31521 Communications Security	6	Automation	Bc.	3./1.
31534 Single-chip controllers programming	6	Automation	Bc.	3./1.
31536 Sensor Technology	6	Automation	Bc.	3./1.
31213 Design and Construction of Medical Devices	5	Biomedical Engineering	Bc.	3./1.
31543 Wave Processing in Medicine	5	Biomedical Engineering	Bc.	3./1.
31513 Sensors in Technology	6	Electrical Engineering	Bc.	3./1.
Sensors and Actuators	6	Autotronic	Bc.	3./1.
31502 Power electronics	6	Electrical Engineering	Bc.	3./1.
31511 Microprocessor technology	6	Electrical Engineering	Bc.	3./1.
31528 Multimedia technology	3	Electrical Engineering	Bc.	3./1.
31552 Computer and office technology	3	Electrical Engineering	Bc.	3./1.
31556 Mechatronics	6	Electrical Engineering	Bc.	3./1.
31500 Electrical apparatus	6	Electrical Engineering	Bc.	3./1.
31507 Electric Power Systems 1	6	Electrical Engineering	Bc.	3./1.
31501 Electric traction 1	6	Electrical Engineering	Bc.	3./1.

31512 Electric drives 1	6	Electrical Engineering	Bc.	3./1.
31509 Selected topics of electrical machines	6	Electrical Engineering	Bc.	3./1.
31514 Electrical machines in English 2	3	Electrical Engineering	Bc.	3./1.
31559 Application of digital signal controllers 1	3	Electrical Engineering	Bc.	3./1.
31610 Electric Power Systems 2	6	Electrical Engineering	Bc.	3./1.
31112 Introduction to photonics	4	All study programmes	Bc.	3./1.
3B0507 Electroacoustic	5	Multimedia Technologies	Bc.	3./1.
31313 Television technology	5	Multimedia Technologies	Bc.	3./1.
3B0510 Design of multimedia WEB pages 1	5	Multimedia Technologies	Bc.	3./1.
31431 Vector graphic and typography	5	Multimedia Technologies	Bc.	3./1.
3B7501 Analog circuit systems 2	6	Telecommunications	Bc.	3./1.
3B7504 Computer networks 2	5	Telecommunications	Bc.	3./1.
3B7503 Radiocommunication systems	4	Telecommunications	Bc.	3./1.
31623 Control Systems Programming	5	Automation	Bc.	3./2.
31563 Electronic Devices Design	4	Electrical Engineering	Bc.	3./2.
31628 Power semiconductor systems	6	Electrical Engineering	Bc.	3./2.
31615 Quality management	4	Electrical Engineering	Bc.	3./2.
31608 Electric drives 2	6	Electrical Engineering	Bc.	3./2.
32413 Design Fundamentals in Power Systems	2	Electrical Engineering	Bc.	3./2.
31632 Applications of Digital Signal Controllers 2	3	Electrical Engineering	Bc.	3./2.
31113 Introduction to fibre optics	5	All study programmes	Bc.	3./2.
310101 Advanced Methods of Automatic Control	7	Process Control Applied Telematics	MSc.	1./1.
310102 Communication Networks	6	Process Control Applied Telematics	MSc.	1./1.
310103 Theory of signal processing in process control	6	Process Control Applied Telematics	MSc.	1./1.
310104 Elements in railway signalling systems	6	Process Control Applied Telematics	MSc.	1./1.
317100 Control systems with safety PLC	6	Process Control	MSc.	1./1.
312100 Medical Electronics	7	Biomedical Engineering	MSc.	1./1.
312101 Modelling and Simulation of Electronic Circuits and Systems in Biomedicine	6	Biomedical Engineering	MSc.	1./1.
312102 Compatibility of Biological and Technical Systems	6	Biomedical Engineering	MSc.	1./1.
310114 Electromagnetic Field Modelling	5	Power Electronic Systems Telecommunication and Radiocommunication Engineering	MSc.	1./1.
319101 Digital Measuring Devices and Systems	5	Power Electronic Systems	MSc.	1./1.
315100 Physics of materials and structures	6	All study programmes	MSc.	1./1.
315101 Photonics	6	All study programmes	MSc.	1./1.
315103 Modelling and simulation in photonics	5		MSc.	1./1.
316101 Radiocommunication networks (RS)	5	Multimedia Engineering	MSc.	1./1.
310112 Signals and communication systems	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	1./1.

318104 Electromagnetic Wave Propagation and Antennas	6	Telecommunication and Radiocommunication Engineering	MSc.	1./1.
316103 Room acoustics	5	Multimedia Engineering	MSc.	1./1.
316104 Multimedia WEB pages design	5	Multimedia Engineering	MSc.	1./1.
310108 Microprocessors, microcomputers & DSP	7	Power Electronic Systems	MSc.	1./1.
319102 Computers in industrial automation 2	5	Power Electronic Systems	MSc.	1./1.
319103 Vehicle Motion Dynamics	5	Power Electronic Systems	MSc.	1./1.
319105 Simulation Tools in Power Electronics	5	Power Electronic Systems	MSc.	1./1.
313101 Control of electric drives 1	6	Electric Drives	MSc.	1./1.
313100 Analysis of electrical machines	6	Electric Drives	MSc.	1./1.
314101 Transients in power systems	7	Electric Power Systems	MSc.	1./1.
314102 Power plants	6	Electric Power Systems	MSc.	1./1.
314103 Electric Substations	6	Electric Power Systems	MSc.	1./1.
310201 Safety-related system communication (BSK)	6	Process Control Applied Telematics	MSc.	1./2.
310202 Analysis of control system safety (ABRS)	7	Process Control Applied Telematics	MSc.	1./2.
310203 Artificial intelligence 1	5	Process Control Applied Telematics	MSc.	1./2.
310204 Applications of Higher Programming Languages (AVPJ)	6	Process Control Applied Telematics	MSc.	1./2.
310205 Railway signalling systems	6	Process Control Applied Telematics	MSc.	1./2.
312200 Information Systems in Medicine	6	Biomedical Engineering	MSc.	1./2.
312201 Technical Means for Medicine	7	Biomedical Engineering	MSc.	1./2.
312202 Acquisition and Analysis of Biopotentials	6	Biomedical Engineering	MSc.	1./2.
312203 Artificial Intelligence in Biomedicine	6	Biomedical Engineering	MSc.	1./2.
312204 Fundamentals of Ecology	5	Biomedical Engineering	MSc.	1./2.
315200 Semiconductor and semiconductor structures	6	All study programmes	MSc.	1./2.
315201 Sources and detectors of radiation	6	All study programmes	MSc.	1./2.
310218 Optical sensors	5	All study programmes	MSc.	1./2.
315202 Waveguide optics	6	All study programmes	MSc.	1./2.
316203 WEB applications design	5	Multimedia Engineering	MSc.	1./2.
316200 Digital television and New Services	6	Multimedia Engineering	MSc.	1./2.
316204 3D applications design	6	Multimedia Engineering	MSc.	1./2.
318201 Radiocommunication systems and networks 1	6	Telecommunication and Radiocommunication Engineering	MSc.	1./2.
318200 Higher programming languages	6	Telecommunication and Radiocommunication Engineering	MSc.	1./2.
310214 Digital audio processing	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	1./2.
310215 Discrete signals processing	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	1./2.
318202 Photonic Communication Systems	6	Telecommunication and Radiocommunication Engineering	MSc.	1./2.
310210 Power semiconductor converters	7	Power Electronic Systems	MSc.	1./2.

310217 Integrated Circuits Design	5	Power Electronic Systems	MSc.	1./2.
310212 Traction batteries and charging infrastructure	6	Power Electronic Systems	MSc.	1./2.
310219 Virtual instrumentation	6	Power Electronic Systems	MSc.	1./2.
319200 Analyse and Synthese od Power Electronic Circuits	6	Power Electronic Systems	MSc.	1./2.
319201 Mechatronic systems	6	Power Electronic Systems	MSc.	1./2.
313211 Electrical machines for special purposes (SES)	6	Electric Drives	MSc.	1./2.
313200 Control of electric drives 2 (REP2)	6	Electric Drives	MSc.	1./2.
310213 Power system modelling	4	Electric Power Systems	MSc.	1./2.
314200 Power system control	8	Electric Power Systems	MSc.	1./2.
314201 Renewable energy sources	6	Electric Power Systems	MSc.	1./2.
314202 Protective relaying	7	Electric Power Systems	MSc.	1./2.
310318 Object oriented system development	7	Process Control	MSc.	2./1.
310302 Application of railway signalling systems	6	Process Control	MSc.	2./1.
310115 Security of information systems	6	Process Control	MSc.	2./1.
310300 Artificial intelligence 2	7	Process Control Applied Telematics	MSc.	2./1.
312300 Biomedical Image Processing	6	Biomedical Engineering	MSc.	2./1.
312301 Signal Processing in Medicine	7	Biomedical Engineering	MSc.	2./1.
310312 Laser and laser systems	6	All study programmes	MSc.	2./1.
310309 Applied optics and light technique	6	All study programmes	MSc.	2./1.
316300 Distribution of Multimedia Signals	4	Multimedia Engineering	MSc.	2./1.
318301 Radiocommunication systems and networks 2	6	Telecommunication and Radiocommunication Engineering	MSc.	2./1.
318306 Microwave systems	8	Telecommunication and Radiocommunication Engineering	MSc.	2./1.
310308 Digital image processing	6	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	2./1.
319300 Design and Construction of Power Electronic Systems	8	Power Electronic Systems	MSc.	2./1.
319303 Electric transfer of HEV and EV vehicles power	5	Power Electronic Systems	MSc.	2./1.
319304 Power Electronics Applications	5	Power Electronic Systems	MSc.	2./1.
Logic circuits	5	Power Electronic Systems	MSc.	2./1.
319306 Control systems of EV and HEV vehicles	5	Power Electronic Systems	MSc.	2./1.
Power Quality	8	Electric Power Systems	MSc.	2./1.
Power System Calculations	6	Electric Power Systems	MSc.	2./1.
Information systems for power system control and monitoring	5	Electric Power Systems	MSc.	2./1.
313300 Sensorless control of electric drives	7	Electric Drives	MSc.	2./1.
313301 Discrete control of electric drives (DREP)	7	Electric Drives	MSc.	2./1.
310401 Automatic identification	5	Process Control	MSc.	2./2.
310402 Security Systems	6	Process Control	MSc.	2./2.
32338 Robotic systems	5	Process Control	MSc.	2./2.
315301 Integrated optics and optoelectronics	5	All study programmes	MSc.	2./2.

3I0409 Trends in Information and Communication Technologies	3	Telecommunication and Radiocommunication Engineering Multimedia Engineering	MSc.	2./2.
3I0407 Discrete control of power systems	6	Power Electronic Systems	MSc.	2./2.
3I9403 Economic aspects of electromobility	6	Power Electronic Systems	MSc.	2./2.
3I3203 Electric Traction	6	Electric Drives	MSc.	2./2.