



FACULTY OF MECHANICAL ENGINEERING

MASTER'S DEGREE STUDY

UNIVERSITY OF ŽILINA

Faculty of Mechanical Engineering

CONTACT

University of Žilina
Faculty of Mechanical Engineering
Univerzitná 8215/1, 010 26 Žilina
Tel.: 041/513 25 01
e-mail: dsjf@stroj.uniza.sk
<http://fstroj.uniza.sk>

All the questions concerning your studies will be attended at the Department of Studies:

Tel.: 041/513 25 07, 25 08
e-mail: studref@fstroj.uniza.sk

Coordinator for work with students with special needs:

Mgr. Branislav Ftorek, PhD.
tel.: 041/513 25 19, 49 62
e-mail: branislav.ftorek@fstroj.uniza.sk

ACCREDITED STUDY PROGRAMMES OFFERED FOR THE ACADEMIC YEAR 2019/2020

MASTER'S DEGREE STUDY PROGRAMMES	
FULL-TIME STUDY	PART-TIME STUDY **
LENGTH OF STUDY 2 YEARS	LENGTH OF STUDY 3 YEARS
Automated Production Systems *	-
Machining and Bearing Production *	-
Computer Aided Design and Simulations in Mechanical Engineering *	-
Mechanical Engineering Technologies *	-
Industrial Materials *	-
Machines and Equipment Design *	-
Industrial Engineering and Management *	-
Environment Technology *	-
Vehicle Maintenance *	-
Vehicles and Engines *	-
-	Mechanical Engineering

* study programme is also accredited in the English language
** the standard tuition fee for part-time study is 600 € for an academic year

Detailed information on particular study programmes

- Syllabus,
- course information sheets

can be found at <http://vzdelavanie.uniza.sk/vzdelavanie/plany.php>.



EXPECTED NUMBER OF ACCEPTED APPLICANTS TO THE FIRST YEAR

MASTER'S DEGREE STUDY		
STUDY PROGRAM / FIELD OF STUDY	PLANNED CAPACITY	
	FULL-TIME	PART-TIME
Automated Production Systems / Mechanical Engineering	20	-
Machining and Bearing Production / Mechanical Engineering	20	-
Computer Design and Simulations in Mechanical Engineering / Mechanical Engineering	20	-
Mechanical Engineering Technologies / Mechanical Engineering	20	-
Industrial Materials / Mechanical Engineering	20	-
Machines and Equipment Design / Transport Machines and Equipment	20	-
Industrial Engineering and Management / Industrial Engineering	40	-
Environment Technology / Energy Machines and Equipment	20	-
Vehicle Maintenance / Machines and Equipment Maintenance	20	-
Vehicle and Engines / Motor Vehicles, Rail vehicles, Ships, Aircraft	30	-
Mechanical Engineering / Mechanical Engineering	-	30
TOTAL NUMBER	230	30



TERMS AND CONDITIONS OF ADMISSION

- **The fundamental prerequisite** of being accepted to the master's degree study programme (study programme of the second degree) is the full completion of the first degree of the university study (Higher Education Act, n. 131/2002 Coll.).
- **Language competence** - for study programmes that are carried out by the faculty in the Slovak language, written and oral command of Slovak or Czech language is required. Knowledge of at least one foreign language (English, German, French) is welcome. For study programmes that are carried out by the faculty in the English language, written and oral command of English is required. The applicants who do not actively speak Slovak or Czech are required to attend the language training. It is possible to attend the Slovak language courses at UNIZA. For more information, please contact the Institute of Lifelong Learning UNIZA <http://www.ucv.uniza.sk/ucv/?ur1=19&ur2=192&ur3=0>
- The basic and other terms and conditions of admission are applicable as for the applicants from abroad as for the applicants from Slovakia.
- Foreign students who study in a foreign language (i.e. not Slovak), pay the tuition fee as stated in § 92 Subsection 8 (Higher Education Act). The tuition fee is specified by the UNIZA directive for the respective academic year, which can be found on the university website. For the academic year 2019/20 the tuition fee is 3500 €.
- Students from abroad who study in the Slovak language do not have to pay the tuition fee.
- For foreign applicants who were accepted on the basis of intergovernmental agreements, bilateral agreements or Slovak government grants, terms and conditions stated in respective documents are applicable.



FORMS OF ADMISSION

1. No entrance exams

- all applicants have to pass the selection procedure.

2. Selection Procedure

- selection procedure is carried out in a form of an interview in order to ensure that the accepted candidates dispose of the necessary skills and abilities.

Rules of Selection Procedure

- within the selection procedure, the results achieved during the undergraduate study, the result of the state examination and completed undergraduate study programme (Bachelor) in the same or related field of study will be evaluated. No entrance examinations take place.



HOW TO APPLY

Application forms are to be submitted for individual study programmes.

In case the applicant is interested in more study programmes, it is necessary to apply for each one individually,

including payment of the respective admission procedure fees.

Applicants have to fill in the form Prihláška na vysokoškolské štúdium - 2. Stupeň or they can also use an electronic application form that can be found on the university website: <https://vzdelavanie.uniza.sk/prijimacky/index.php> or on the education portal: <https://prihlaskavs.sk/sk/>.

Even in case of electronic application form, it is required to print it, sign it, enclose other required documents including the proof of payment of the fee and send it to the address of the Faculty of Mechanical Engineering UNIZA within the stipulated deadlines.

Incomplete application form or application form sent after the deadline will not be accepted.

In the absence or failure of entrance exams, the faculty does not refund the admission fee.

If an applicant wants to take part in entrance exams at more faculties of UNIZA, the application forms have to be sent separately to each faculty and the respective admission procedure fees paid separately to each faculty.

Enclosures for the master's degree programmes (to be sent with application forms):

- Curriculum Vitae,
- proof of payment of the admission fee,
- copy of the Diploma.

Admission fee:

Send **20 €** to:

Žilinská univerzita, Univerzitná 1, 010 26 Žilina

Bank: Štátna pokladnica

IBAN: SK34 8180 0000 0070 0026 9861

const. symbol: 0308

variable symbol: 10232 - masters study

Payment method:

payment can be paid by bank transfer or postal order to the account above.

Proof of payment:

proof of payment is to be sent to the Faculty with the application form.

With payment of the admission fee from the EU member states, the EES countries, territories that are considered a part of the EU (Treaty of Rome, Section 299) and SEPA countries, it is necessary to use BIC: **SPSRSKBAXXX**, IBAN: **SK34 8180 0000 0070 0026 9861**.

Tuition fees - in accordance with the Higher Education Act, information about the amount of tuition for the respective academic year will be announced on the website of the University of Žilina.



USEFUL DATES

Open Day	Deadline for submitting the application form	Entrance exams
November, 21, 2018 January, 29, 2019	until March, 31, 2019	June, 27, 2019



ACCOMMODATION

Student accommodation facilities cost approx.: **70 € - 140 € per month**.



BOARD

Students can use services of catering facilities of the University of Žilina in Žilina. **Price for food: 9 € per day**.



SCHOLARSHIPS

Students of all study programmes can obtain motivational scholarships (for excellent results or exceptional achievements) and departmental scholarships in accordance with the stated criteria.



FOLLOW-UP STUDIES AFTER COMPLETION OF MASTER'S DEGREE STUDIES

There is a possibility of extended studies within follow-up doctoral degree programmes at the Faculty of Mechanical Engineering UNIZA in the academic year 2019/2020 - Automated Production Systems, Mechanical Engineering Technologies, Industrial Materials, Machine Parts and Mechanisms, Computer Modelling and Machine Mechanics, Energy Machines and Equipment, Rail Vehicles, Industrial Engineering and Management (respective information about particular study programme is available at the university website). After completing the master's degree, it is necessary to verify the current state of the offer of study programmes in a particular academic year.



GRADUATE PROSPECTS

MASTER'S STUDY PROGRAMMES

AUTOMATED PRODUCTION SYSTEMS

(Field of study 5.2.1 Mechanical Engineering)

The study programme Automated Production Systems is focused on issues of automation and computer support in production technologies, in particular on flexible manufacturing systems in mechanical engineering, computer support in pre-production stages, design in automated mechanical engineering industry, on the field of digitally controlled production machines, robot technology, application of microelectronics and computing technology in production technologies, and creation of control systems for automated machinery equipment.

The basis of acquired knowledge of graduates of the study programme will be from the field of production technologies for mechanical engineering, further from the field of technological processes of production of semi-finished goods, production technology and assembly of spare parts, technical preparation of production, design of production processes and systems, handling, transport and storage of components in the context of the rationalisation of engineering production, economics and management of mechanical engineering, automation and computer support.

Graduates are able to systematically and comprehensively solve material, technological and organizational issues of the production technologies with the use of automated tools and approaches as well as computer support in pre-production, production and post-production stages of the spare parts implementation based on the methods of mathematical modelling, simulation and optimisation. The graduates' abilities are integrated with the knowledge of economic character.

Students will be prepared for the study programme of the third degree in a related field of study.

Graduates will find employment as members of the middle management level of production, in the departments of technical production, especially in the field of technological design with computer support, in the field of design and management of flexible production systems, in research and development of technological processes and systems and implementation of automation in mechanical production.

MACHINING AND BEARING PRODUCTION

(Field of study 5.2.1 Mechanical Engineering)

The professional profile of graduates of the study programme Machining and Bearing Production is characterised by the theoretical but mainly practical knowledge of construction, technological design and engineering technologies, production facilities and automation, quality of mechanical production, economics and production control and by habits and abilities of the skilful application of the acquired knowledge in practice. The graduates obtain theoretical but mainly practical knowledge of the most widespread technologies in mechanical engineering and bearing production, as well as of automation of mechanical engineering and bearing production. They acquire habits and skills in design and technological activities and in application of modern technological tools. Graduates also have the advanced knowledge in the field of production, testing, technological processing, selection, exploitation and degradation of properties of the main types of technical materials. Graduates are able to operate mainly in industrial businesses: in the field of technical material production, their technological processing to semi-finished goods and products as well as in quality control, purchase, sale, service and maintenance. Graduates are qualified to work in operation of industrial engineering companies, in the automobile industry, bearing industry, in all areas of engineering technologies using machining and in other organizations of the economic, production, operation or diagnostic character. The graduates acquire appropriate knowledge in the field of electronics, mechatronics, robotics as well as in the field of computeraided mechanical engineering and manufacturing. They have sufficient practical experience and skills in laboratory work, they master professional terminology in a foreign language, and they are able to apply economic methods necessary for the operation of existing systems.

COMPUTER AIDED DESIGN AND SIMULATIONS IN MECHANICAL ENGINEERING

(Field of study 5.2.1 Mechanical Engineering)

Graduates of the master's study programme Computer Aided Design and Simulations in Mechanical Engineering are able to creatively use the methods of calculation, simulation and verification of model solutions in the design of mechanical systems and their constructions. The main emphasis is put on their readiness and ability of independent development, elaboration and practical application of engineering approaches when solving technical problems in the field of linear and nonlinear response of constructions. Graduates are able to perform static, kinematic and dynamic analysis of mechanisms and constructions, to assess lifetime and reliability of the investigated objects. They are capable of analysing thermal stress, to solve technical tasks of flow, thermodynamics, heat and material transfer. Graduates receive adequate knowledge of information technology, foreign languages and economic as well as legal aspects of the field. They are able to properly formulate technical problems, to analyse and solve them. They have an overview of general and scientific approaches and methods. They are able to comprehensively assess and recognize what is essential in the design and diagnostics of mechanical systems and constructions not only in relation to the problem, but also to the environment. They master modern numerical methods of computational dynamics in order to identify and analyse fields such as methods of finite and infinite elements and passports, marginal elements and others. They are employable in the field of optimal structural design of machines, constructions and industrial products, technological units and equipment. In their work they are able to use software aided engineering tools such as: AutoCAD, Inventor, Pro/Engineer, Mechanical Desktop, Solid Edge, Ideas, Catia, MATLAB, Mathematica, MathCAD, Maple, ANSYS, ADINA, Marc, Nexis, SYSWELD, ADAMS, and others. Graduates are able to model, simulate and analyse different types of fields separately or in interaction as a bound problem in the macromechanical systems as well as in the micro- and nanostructures. They are able to programme a formulated technical problem into a computer programme and transform it into design. They have acquired basic knowledge in the field of experimental mechanics. Graduates are mainly employable in the field of design, evaluation and innovation of machine construction and technological equipment.

MECHANICAL ENGINEERING TECHNOLOGIES

(Field of study 5.2.1 Mechanical Engineering)

The professional profile of graduates of the study programme Mechanical Engineering Technologies is characterised by theoretical as well as practical knowledge of construction and mechanical engineering technologies, production facilities, quality, economics and production management and by abilities and capabilities of skilful application of acquired knowledge in practice. Graduates have acquired theoretical and practical knowledge of the most widespread non-cutting technologies of mechanical engineering production and its management. They have acquired habits and skills in technological activities in the use of modern technological tools. Graduates also have professional knowledge in the field of production, testing, technological processing, selection, exploitation and degradation of properties of the main types of technical materials. They are ready to operate mainly in industrial businesses: in the field of technical material production, their technological processing to semi-finished goods and products as well as in quality control and assurance, in purchase, sale, service and maintenance. Graduates are qualified to work in operation of industrial mechanical engineering companies, in rail and public transport, in all areas of mechanical engineering and in other organisations of administrative, production, operating or repair character. They have sufficient practical experience and skills in laboratory work and they have a good command of professional terminology in a foreign language.

INDUSTRIAL MATERIALS

(Field of study 5.2.1 Mechanical Engineering)

Graduates of the study programme Industrial Materials master the methods of calculation, simulation and verification of model solutions of projection, machinery construction and machinery systems; they have knowledge of new materials, theory and technology of their production and processing, methods of their evaluation and influencing of their performance; they are familiar with the creation and management of technological and production processes in machinery, they have adequate knowledge of testing, operation and maintenance of machinery, they have also knowledge of selection of appropriate materials and engineering operations impacts on the environment.

Graduates are able to analyse, design, construct and maintain large-scale technical solutions covering the area of mechanical engineering with an emphasis on industrial materials; they are able to conduct research with a high degree of creativity and independence. They have a deep knowledge of the fields of mechanical engineering that allows them to manage the teams of workers in this field, lead projects independently and take responsibility for the complex solutions. They are able to build a respectable scientific approach. During their studies the students gain experience in formulation of hypothesis, experimental design, testing hypotheses and data analysis; they are able to apply advanced methods and techniques of design and development of technical materials for the needs of mechanical engineering constructions.

MACHINES AND EQUIPMENT DESIGN

(Field of study 5.2.3 Transport Machines and Equipment)

Graduates in the second degree study will deepen their knowledge of applied sciences focused on the design and construction of machines and equipment. In the course of the master's degree study the attention is paid to the equipment and technologies currently used in the development and construction of machines, equipment and their prototypes. Students have the possibility based on the choice of offered optional subjects for further enhancement of their knowledge. Knowledge of design, construction materials, construction methodology, innovation, methods of calculation and simulation for structural and dynamic analysis and optimisation of construction parts and nodes, based mainly on the finite element method, currently form a necessary base for the successful application of constructors and designers of machines and machinery equipment on the European labour market.

Mastering of modern methods of computer modelling and simulation, computer projecting, design and construction, as well as experimental methods in the field belong to the knowledge and skills of the study programme graduates. In addition, they include managing routine work with systems for 3D modelling and design, such as Creo, Catia and with systems for analysis, simulation and optimisation, focusing mainly on systems Ansys and Adams, or Opti Struct. Graduates will acquire knowledge and skills of how to practically use the technology of Rapid Prototyping and Reverse Engineering in the field of machine and equipment development and innovation.

Students will demonstrate their knowledge and skills mainly in solving semester projects and diploma thesis. The study programme ends with the state examination and defence of the diploma thesis.

Graduates will acquire knowledge of construction, design and testing of machinery and equipment in general. During their study, students acquire theoretical and methodological basis of professional and practical experience necessary for solving a wide range of issues related to the design, projecting and construction of machines and equipment.

Graduates are employable especially in the field of research and development, in the design, projecting and construction of machines and equipment based on sophisticated methods and procedures.

INDUSTRIAL ENGINEERING AND MANAGEMENT

(Field of study 5.2.52 Industrial Engineering)

Graduates are qualified to get involved in the solution of technical-organisational and development areas, primarily at the middle management level of a manufacturing company. They are prepared to solve complex tasks in the field of logistics and management of supply chains, in-house logistics and optimisation of inventories and material flows, implementation of all company information systems, planning and production control, quality management, design of production processes and systems, management of innovations, introduction of industrial engineering methods in individual company departments, computer modelling of company processes, project management, application of operational research methods, etc.

Graduates of the study programme Industrial Engineering and Management are employable mainly in positions of middle management of manufacturing organisations and in departments of industrial engineering. They are prepared to occupy posts of system engineers, quality engineers, productivity engineers, designers of production systems, production engineers, employees of technical preparation of production, industrial engineers, heads of production planning and control, heads of logistics department, heads of maintenance department, employees of human resources department, and others. They are qualified to work also at the top management level.

ENVIRONMENT TECHNOLOGY

(Field of study 5.2.6 Energy Machines and Equipment)

Following the first degree of study, graduates in the second degree of their professional study in applied sciences have acquired good theoretical and methodological professional basis and practical experience necessary for solving a wide spectre of problems related to the designing, projecting and operation of heating, ventilation and air conditioning systems and other facilities that are applied in heating, ventilation and gas systems, taking advantage of modern computing methods.

The study programme Environment Technology focuses on the well-being of indoor environments (residential, office, industrial buildings), power equipment with the help of which it is possible to create and adjust the environment with the use of different energy sources. Graduates are employable in the fields of designing, projecting and operation of heating, air conditioning and gas systems as well as in areas solving the problems of reduction of energy performance of technological processes, more efficient use of thermal energy (both in industry and in municipal construction) and issues of utilisation of renewable (alternative) energy sources.

VEHICLE MAINTENANCE

(Field of study 5.2.2 Machines and Equipment Maintenance)

Graduates of the study programme Vehicle Maintenance are after the successful completion of the master's degree study capable of performing work of a Maintenance Engineer. Maintenance Engineer has a good command of the methodology and procedures of implementation and operation of transport means, he/she has knowledge of their construction and

operation, masters methods of analysis and evaluation of reliability of technical and operational systems, methodology of sophisticated procedures in creating complex maintenance systems of transport means applied in industry and service systems, methodology and procedures of designing and implementing maintenance information systems at the managerial level (Computer Maintenance Management Systems – CMMS). Graduates acquire knowledge and practical skills in methodical approaches and creation of procedures in project management of operation and maintenance in complex care for machines and equipment. Moreover, they acquire knowledge and experience of model simulation and verification of solutions of machine operation, taking into account the real impact of interactions on operation and the environment, of methods of technical management and procedures for maintenance activities associated with the operation of vehicles as well as technical diagnostic methods. Graduates are employable mainly in designing of complex maintenance systems, in management, in organisation and technical preparation of transport means maintenance, in control, organisation and technical preparation of service activities related to the operation of transport means, in the field of managing services and business related to machines and their equipment, as well as private entrepreneurs (in engineering) in the field of maintenance, service and sale of machines.

VEHICLES AND ENGINES

(Field of study 5.2.4 Motor Vehicles, Rail vehicles, Ships, Aircraft)

Graduates of the second degree study programme Vehicles and Engines are able to analyse, design, construct, operate and maintain large-scale technical systems of vehicles especially in the field of automotive vehicles and their power drive subsystems. They are able to use solutions with a high degree of creativity, complexity, autonomy and responsibility. They have a thorough knowledge of basic theoretical disciplines of mechanical engineering (engineering mathematics, mechanics of vehicles, elasticity and plasticity) as well as in the field of construction and design of vehicles and their subsystems. They have a general overview of mechanical engineering production and its management, expert knowledge of the theory of road and rail and combustion engines. They acquire knowledge in the field of public transport means, technical means of combined transport, maintenance technologies, and optionally, of the aircraft power plants.

Their deepened and expanded knowledge of theoretical and professional subjects enables graduates of the master's degree study programme Vehicles and Engines to find and present their solutions to problems of research, development, projection and construction of transport means, especially vehicles and their systems. Graduates can creatively apply their knowledge in practice, critically analyse and apply the full range of concepts, principles and practices of the field in the context of loosely defined problems, and demonstrate effective decision making regarding selection and use of methods, techniques and tools.

They are able to implement complex technical solutions, to utilise modern methods and tools in order to solve problems. Graduates of the second degree study programme Vehicles and Engines are able to work effectively as individuals or as team members or team leaders, to cooperate with the superior units, to continually increase their qualifications, including the development of technical and managerial skills, to keep in touch with the latest developments in their discipline, to follow appropriate practices in accordance with the rules and professional, legal and ethical framework of their subject field. Graduates are able to design and to provide modern construction solutions of vehicles and their subsystems using advanced computeraided technologies. They are able to find work in operation of vehicles, especially rail vehicles, road vehicles, internal combustion engines, hydraulic and pneumatic machines and equipment for their diagnostics, maintenance and repairs. The graduates meet conditions for the further education in the third (doctoral) degree studies, especially in the study programme Rail Vehicles.

MECHANICAL ENGINEERING

(Field of study 5.2.1 Mechanical Engineering)

The professional profile of graduates of the study programme Mechanical Engineering is characterised by theoretical and practical knowledge of construction and mechanical engineering technologies, production facilities and automation, quality of mechanical production, economics and production control and by abilities and capabilities of the skilful application of the acquired knowledge in practice. Graduates acquire theoretical and practical knowledge of the most widespread technologies in mechanical engineering production and in the field of automation of mechanical engineering. Graduates acquire habits and skills in construction, design and technological activities and in application of modern technological tools. Graduates also have the basic knowledge in the field of production, testing, technological processing, selection, exploitation and degradation of properties of the main types of technical materials. They are able to operate mainly in industrial businesses: in the field of technical material production, their technological processing to semi-finished goods and products as well as in quality control and assurance, in purchase, sale, service and maintenance. Graduates are qualified to work in operation of industrial mechanical engineering companies, in railway and public transport, in all areas of mechanical engineering and in other organisations of administrative, production, operating or repair character. Graduates have adequate knowledge and skills in the field of electronics, mechatronics, robotics, drives, as well as in the field of computeraided mechanical engineering manufacturing. They have sufficient practical experience and skills in laboratory work, they master professional terminology in a foreign language, and they are able to apply the basics of economic methods necessary for operation of the existing systems.