Dear ladies and gentlemen, colleagues and guests,

Let me evaluate the past year and introduce our plans for the New Year of 2013.

I will in particular address the following issues:
1/ what we have achieved and are proud of
2/ where we did not succeed as expected and where our weaknesses lie
3/ what particular tasks should be implemented in the near future.

It will not be a chronological overview of what has happened at the Faculty. Instead, I will focus on several specific issues of the last year as viewed by the Dean, which may sound quite subjective.

Identified as a breakthrough of the year in 2011, MTF again progressed upwards in the final ARRA ranking and rating by winning 6th place within the technical faculties in Slovakia and being denoted as the 3rd most successful Faculty of STU. This is despite the fact that we are the second largest Faculty in Slovakia, which is not in our favour for the calculation of performance evaluation in the ARRA ratings. Currently, there are more than 3600 students enrolled in the Faculty programmes, which demonstrates constant interest in the study, despite the overall decrease of the number of the secondary school graduates in the country. That is good news - a positive effect of the Faculty image, a wide scope of the Faculty bachelor’s programmes, dynamic study promotion carried out by the Division of Academic Activities and many individuals (such as our study ambassadors), suitable promotion and dissemination of information via the ALUMNI programme.

While in the last year meeting I mentioned that ours had been the most successful Faculty in Slovakia in raising finances from the European structural funds, I can state now that in 2012 we prepared further projects. Within the planning period of 2007-2014 we have implemented or contracted projects worth EUR 90 million, and are about to start building the Campus Bottova with two new research centres (the Centre of Materials Research and the Centre of Industrial Automation and ICT Implementation) worth EUR 42 million. Construction activities will commence this April/May; public procurement including internationally unique technologies has taken place for contracts valued at more than EUR 26 million.

In other words: the University Scientific Park in Trnava (acronym CAMBO from Campus Bottova) is a vision that is coming true.

We have submitted a Complementary Educational Programme for training 15 members of technical and scientific staff who would start operating the unique equipment and devices in the field of ion and plasma technologies in mid 2015. Trainings and courses scheduled for 2 years should assure utilisation of the expensive advanced technology immediately after its installation for the purposes of scientific research.

As for reserves: publication activity of our PhD students brought the first fruits last year. The Faculty minimum publication requirements for admission to the dissertation thesis defence (i.e. three contributions registered in reputable electronic databases as categorised by the Accreditation Commission of the SR Government) have become common, despite the initial objection of supervisors. Another useful activity of our PhD students is “A Doctoral Week” during which doctoral students of six Faculty Institutes share information about their work, while looking for new links for interdisciplinary cooperation. Let me express my thanks to the PhD students, lecturers and organisers involved in that successful event. I am confident that the event will thrive this year, too.

I am particularly proud of the Faculty administration staff that has provided their clients, both students and employees, with expertise and a high international standard of work. This concerns e.g. thousands of student applications per year (ether to the Registrar’s Division or Library), thousands of similar requests and applications from our teachers and researchers, promotion of study abroad and projects worth millions of euros to be dealt with every day, in order to fairly and with a professional approach satisfy the applicants. Besides, the proportion of verbal or written communication in English keeps growing dramatically.

Ladies and gentlemen,
1/ Our achievements are unthinkable without co-operation with our partners from the governmental, public and private sectors. Key partnering institutions from home and abroad include: Region of Trnava, City of Trnava, JAVYS a.s., DELCAM, Beakert, VUTE a.s., Ornage Slovakia, Prvá zváračská (First Welding Co.) a.s., ZOS Trnava, Helmutz Zentrum Dresden-Rossendorf, IPF Dresden, TU Dresden, TU Ilmenau, Germany, University of Miskolc, Hungary, Univerzita Central Marta Abreu de las Villas, Cuba, College of Keckemet, Hungary, College of Koethen, Germany, State Technical University of Kalashnikov in Izhevsk, Russia and many other partners from the Czech Republic, Austria, Germany, Hungary, Poland, Croatia and Serbia. Upon our proposal, STU Recor granted two foreign scientists – Professor Eckart from Germany and Professor Machado from Cuba the highest university award– Dr.h. c.

2/ Our weaknesses comprise of the following:
1. We have not succeeded in distinguishing and recording the pedagogical and research activity of our university teachers and researchers: our overall research results are being achieved by less than 69% of our staff, while we all are paid more or less equally;
2. We have now almost reached the limit of co-financing projects from the European structural funds.
3. We are not fully capable of providing suitable replacements for leaving/reiring associate professors and professors.
4. The latest inconsistent amendment of the higher education legislation impedes 2 x 100% load of a university teacher, but tolerates 298%. This is an inexplicable and incomprehensible fact for foreign partners.

In 2013 we intend to:
- Prepare a complementary project of “Renewable energy sources” for the emergent University Scientific Park, worth approximately EUR 40 million;
- Revitalise the Faculty sports facilities according to the pre-prepared list of priorities – tennis courts, swimming pool, gymnasium;
- Intensify international collaboration by preparing projects within FP8 so that each institute participates in at least one FP8 project in the period 2014-2020;
- Organise the 8th International Doctoral Seminar in Dubrovnik in co-operation with partners the University of Zagreb/FOI, Croatia and University of Zielona Gora, Poland;
- Prepare documentation for complex accreditation of the Faculty and University in the year 2014;
- Pay special attention to the quality of pedagogical process;
- Develop further the activities that have elevated us among the most successful technical faculties in ARRA ranking;
- Proceed from meeting quantitative criteria to meeting qualitative criteria, i.e. regulate the number of admitted students while emphasising qualitative evaluation of study.

In the conclusion, let me welcome new member of our team, a full-time Professor Ing. Ján Lokaj, CSc. Good health to you and I hope you all enjoy a pleasant working atmosphere at the Faculty.

Prof. Dr. Ing. Oliver Moravčík
Dean of the Faculty
MANAGEMENT OF THE FACULTY

Prof. Dr. Ing. Oliver Moravčík
Dean of the Faculty

Prof. Dr. Ing. Jozef Peterka
Vice-Dean
Development
Information Technologies
Know-how Transfer
Prognostics

Assoc. Prof. RNDr. Mária Mišútová, PhD.
Vice-Dean
Bachelor’s Degrees
Accreditation of Bachelor’s Degrees
Motivation Scholarship
Study Promotion

Assoc. Prof. Ing. Peter Schreiber, PhD.
Vice-Dean
Master’s and PhD Degrees
Accreditation of Master’s and PhD Degrees
Student Social Affairs
Education Quality, Educational Process Inspection

Prof. Ing. Peter Grgač, PhD.
Vice-Dean
Research
International Relations
Professional Development of Academic Staff

Assoc. Prof. Ing. Helena Vidová, PhD.
Vice-Dean
Internal Relations
Public Relations
Publishing Activity
Social Programmes for Staff
Security System
ALUMNI

INSTITUTES OF THE FACULTY

Institute of Materials Science
Institute of Production Technologies
Institute of Production Systems and Applied Mechanics
Institute of Industrial Engineering, Management and Quality
Institute of Safety and Environmental Engineering
Institute of Applied Informatics, Automation and Mathematics

DIVISIONS OF THE FACULTY

Division of Academic Activities
Division of Knowledge Management
Division of Economic and Estate Activities
Division of Communication and Information Systems
Division of Personnel and Administration Activities

OTHER WORKPLACES

Centre for Technology Transfer
Department of Humanities and Social Sciences
Department of Engineering Pedagogy
(from 30/08/2012)

DETACHED WORKPLACES

Komárno Detached Workplace
Dubnica Detached Workplace

FACULTY FACILITIES

Student Hostel and Canteen
**SCIENTIFIC BOARD**

**Chair:**
Prof. Dr. Ing. Oliver Moravčík

**Members:**
- Prof. Ing. Karol Balog, PhD.
- Assoc. Prof. RNDr. Mária Behúlová, CSc.
- Assoc. Prof. Ing. Miroš Čambář, CSc.
- Prof. Ing. Alexander Causs, DrSc.
- Prof. Ing. Peter Grgač, CSc.
- Assoc. Prof. Ing. František Honfiľík, PhD.
- Prof. Ing. Lubomír Jahňátek, CSc.
- Assoc. Prof. Ing. Jozef Janovec, DrSc.
- Prof. Ing. Peter Jurčí, PhD.
- Assoc. Prof. Ing. Mária Kapustová, PhD.
- Assoc. Prof. Ing. Martin Kusý, PhD.
- Prof. Ing. Milan Maroňek, PhD.
- Prof. Dr. Ing. Jozef Peterka
- Prof. Ing. Jozef Sablik, CSc.
- Prof. Ing. Peter Sakáľ, CSc.
- Assoc. Prof. Ing. Peter Schreiber, CSc.
- Assoc. Prof. Ing. Peter Soldán, PhD.
- Prof. Ing. Peter Šugár, CSc.
- Assoc. Prof. Ing. Pavol Tanuška, PhD.
- Assoc. Prof. Ing. Ivana Tureková, PhD.
- Prof. Ing. Koloman Ulrich, PhD.
- Assoc. Prof. Ing. Pavol Važan, CSc.
- Prof. h. c. Prof. Ing. Karol Veľšek, CSc.
- Assoc. Prof. Ing. Helena Vidová, PhD.

**External members:**
- vis. Prof. Ing. Peter Podreč, PhD.
- Assoc. Prof. PhDr. Ing. Aleš Gregar, CSc.
- Prof. Dr.-Ing. habil. Peter Husár
- vis. Prof. Ing. Ladislav Kupča, PhD.
- Ing. Juraj Lapin, DrSc.
- Prof. Ing. Ervín Lumnitzer, CSc.
- Prof. Ing. Milan Dravec, PhD.
- Prof. Dr. Ing. Milan Sága
- Dr. Ing. František Simančík
- vis. Prof. Ing. Daniel Švrček, PhD.
- Prof. Ing. Jozef Zajac, CSc.

**Honorary Members of the Scientific Board**
- Prof. Dr.Sc. Dr. Ing. Michael E. Auer
- vis. Prof. Ing. Miroslav Božík, PhD.
- Ing. Peter Doll
- Prof. Ing. Aleš Dudáček, PhD.
- Assoc. Prof. Ing. Fedor Gömöry, DrSc.
- Prof. Dr. Ing. Bela Illes
- Prof. Ing. Jiří Kliber, CSc.
- Ing. Luboš Lopatka, PhD.
- Ing. Tibor Mikulč, PhD.
- Ing. Jozef Želisky

**Bursar**
Assoc. Prof. Ing. Róbert Riedlmajer, PhD.

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**ACADEMIC SENATE**

**Chair:**
Assoc. Prof. Ing. Miroš Čambář, CSc.

**Chair of Academic Staff Chamber:**
Assoc. Prof. Ing. Peter Schreiber, CSc.

**Chair of Student Staff Chamber:**
Ing. Michal Ondruška

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**ACADEMIC STAFF CHAMBER**

**Employees:**
- Prof. Ing. Karol Balog, PhD.
- Assoc. Prof. Ing. Miroš Čambář, CSc.
- Assoc. Prof. Ing. Lubomír Čaplovič, PhD.
- Ing. Marta Kučerová, PhD.
- Assoc. Prof. Ing. Peter Pokorný, PhD.
- Prof. Ing. Milan Maroňek, CSc.
- Assoc. Prof. Ing. Milan Naf, CSc.
- Assoc. Prof. Ing. Róbert Riedlmajer, PhD.
- Prof. Ing. Jozef Sablik, CSc.
- Assoc. Prof. Ing. Peter Schreiber, CSc.
- Assoc. Prof. Ing. Pavol Tanuška, PhD.
- Prof. Ing. Koloman Ulrich, PhD.
- Prof. h. c. Prof. Ing. Karol Veľšek, CSc.
- Assoc. Prof. Mgr. Róbert Vrábel, PhD.

**Students:**
- Miroslav Fuller
- Ing. Jozef Horváth
- Bc. Ondrej Kimlička
- Miriama Kolínková
- Bc. Martin Krivý
- Ing. Júlia Kurnátová
- Ing. Michal Ondruška
The priorities for development in 2012 were as follows:

1/ The long-term plan of STU MTF development for the period 2012 – 2017, along with an update of the long-term plan of the Faculty development, was approved in May 2012.

2/ Key activities of the Faculty development in 2012:
- 09/2012 – a presentation demonstrating the “Centres of Excellence” and the Faculty research priorities at the International Engineering Fair in Brno (Czech Republic).
- 10/2012 – co-organisation of the scientific Conference on Current and Future Power Sources.
- 11/2012 – a TV documentary entitled “Spectrum of Science” featuring the STU MTF “Centres of Excellence” was shown on SR public television.
- 11/2012 – STU MTF wins the top prize, “Award and diploma for the best presentation in 2012”, for the “Centres of Excellence” presentation within the event the “Week of science and technology in Slovakia 2012”.
- 12/2012 – the project is submitted for the creation of the CAMBO STU MTF - University Research Park which will focus on activities in the field of materials science, specifically the area of ion and plasma technologies, automation and ICT implementation in industrial processes.

3/ Procurement of new equipment for the “Centres of Excellence”:
- DMG monoBLOCK J85 5-axis CNC machine
- Laser Tec 80 Shape Laser CNC machine
- Laser robotised workplace for material cutting
- Conic calorimeter
- Safety calorimeter
- Explosion chamber
- Multi-purpose laboratory furnace
- X-ray diffractometer
- Testing device for stress corrosion test

4/ Reconstruction of the Faculty buildings in the year 2012:

<table>
<thead>
<tr>
<th>Object of reconstruction</th>
<th>Place of reconstruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reconstructed Department of indoor swimming pool</td>
<td>Department of Humanities and Social Sciences</td>
</tr>
<tr>
<td>Reconstructed floors in the Student Dormitories</td>
<td>Student Dormitories</td>
</tr>
</tbody>
</table>

5/ Co-operation with practice:

Company Presentations at MTF STU in 2012

27/02/2012 - A visit by Karl-Peter Simon, the vice-president of Bauer Gear Motor GmbH Co. The German company based in Esslingen, established a subsidiary, Bauer Gear Motor Slovakia s.r.o. in Zlaté Moravce and is looking for partners in Slovakia. Mr Simon and representatives of selected Faculty institutes (Institute of Materials, Institute of Technology, Institute of Industrial Engineering, Management and Quality and Institute of Applied Informatics and Mathematics) discussed the options of commercial co-operation in the field of applied informatics.

06/03/2012 - A presentation on the topic “Production Systems in Volkswagen Slovakia” for students interested in an internship and/or employment in Volkswagen Slovakia a.s. The latest VW up! model was displayed in front of the MTF Pavilion on Paulínska Street.

07/03/2012 - A presentation by PMP Montex s r.o.
introducing the latest technologies, such as the process of laser welding. The presentation illustrated the options of the laser beam and laser technology applications.

12/06/2012 - A seminar on forging organised by the Department of Forming, STU MTF Institute of Technol-
gies and attended by representatives of the forgeries, HKS Forge, s.r.o. Trnava, ELBA, a.s. Kremenica, Metalurg Steel, s.r.o. Dubnica, SLOVARM, a.s. Myjava and Union of Forgeries in Czech Republic. A series of interesting presentations on the topic of innovation trends in man-
ufacturing die forgings were delivered by representa-
tives of the Institute of Technologies and the above-mentioned forgeries.

27/07/2012 - A visit by Dr. Andreas Mohr, Ing. Karl Tillinger, Ing. Marián Stalžovský and Ing. Tomáš Šimo, the CARL ZEISS/SRN representatives for Poland, Czech Republic and Slovakia. The guests visited the MTF “Cen-
tres of Excellence” and subsequently negotiated an agreement to co-operate in the educational and re-
search fields, with the focus on metrology. Also assessed was a potential bilateral agreement between CARL ZEISS and STU MTF for the period 2013-2016.

18/10/2012 - A presentation by LENOVO Co., offering job opportunities to STU MTF graduates.

24/10/2012 - A presentation by Jaroslav Kuracina and his GRAND POWER Company, within the series of lec-
tures entitled “Innovation for Success”, presenting the careers of successful Slovak entrepreneurs.

31/10/2012 - A lecture entitled “Advanced Software Testing I.” by Ing. Roman Nagy, Ph.D., an expert for soft-
ware architecture and software development at the di-
vision of research and development at BMW AG Munich Automotive.

26/11/2012 - The 3rd presentation within the “Dia-
logues with practice” series delivered by Assoc. Prof. Ing. Ján Lešnisky, CSc., Head of the STU Institute of Life-long Education in Bratislava. The topic of his presen-
tation was “The industrial world in the year 2020”.

10/12/2012 - The 4th presentation within the “Dia-
logues with practice” series with Assoc. Prof. Ing. Štefan Rosina, PhD., president of Board of Directors and CEO of MATADOR Holding, a.s. The topic of his presentation was “The transformation of a resin company to a ma-
chine one, and the conditions of assuring its competi-
tiveness”. Along with the information on the company

proposes and aims, he presented interesting ideas re-
garding the necessity of supporting research and devel-
opment, as well as the training of university students and strengthening the links between theory and prac-
tice, and industry and education.

STU MTF presentations for economic practice in 2012

28/02/2012 - STU MTF presentation in a special issue of Productivity and innovation journal.

13/07/2012 - New presentations of the Faculty insti-
tutes for economic practice

9-14/09/2012 - STU MTF participation in the Intern-
ternational Engineering Fair 2012 in Brno, the major in-
dustrial fair in Central Europe. STU MTF presented its “Centres of Excellence” and the research characteristics of its institutes within the institution of research & de-
velopment, technologies transfer, financial and other services.

03/10/2012 - Representatives from the Institute of Industrial Engineering, Management and Quality partic-
ipated in the 15th National Forum of Productivity 2012 attended also by the representatives of the Ministry of Economy, Ministry of Labour, Social Affairs and Family, Slovak Academy of Sciences as well as representatives of three major automotive companies in Slovakia.

7-11/11/2012 - Participation in the exhibition of “Cen-
tres of Excellence” within the “Week of Science and Technology in Slovakia 2012”. The event was organised by the SR Ministry of Education in co-operation with the National Centre for Popularisation of Science and Tech-
ology in Society. Presented at the exhibition were the practical applications of research results. STU MTF ac-
tained the top "Award and diploma for the best presen-
tation of the Centre of Excellence activity in 2012".

28/02/2012 - Public TV (STV2) showed a documen-
tary “Spectrum of Science”, the STU MTF “Centres of Excellence”.

6,11,13,20,27/11, 4,12/2012 - Live discussions shown on the regional Municipal Television Trnava net-
work about the development of STU MTF and its vision, practice, and industry and education.

6/ Research infrastructure projects in 2012:

<table>
<thead>
<tr>
<th>Institute/workplace</th>
<th>Operation programme</th>
<th>ITMS</th>
<th>Title of project</th>
<th>Time Period of Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slovak University of Technology</td>
<td>OPVaV</td>
<td>26250120045</td>
<td>Stage II of the complex modernisation of educational tangible information and communication infrastructure of the STU workplaces</td>
<td>06/2010-12/2012</td>
</tr>
<tr>
<td>Institute of Production Technologies</td>
<td>OPVaV</td>
<td>26220120045</td>
<td>Centre of Excellence for 5-axis Machining – experimental basis of high-tech research</td>
<td>01/2010-12/2012</td>
</tr>
<tr>
<td>Institute of Production Technologies + MIKON, s.r.o.</td>
<td>OPVaV</td>
<td>26220220137</td>
<td>Industrial research into silent blocks for excessive load in extreme temperatures in the field of industrial application</td>
<td>11/2011-10/2015</td>
</tr>
<tr>
<td>Institute of Materials Science</td>
<td>OPVaV</td>
<td>26220220137</td>
<td>Industrial research into silent blocks for excessive load in extreme temperatures in the field of industrial application</td>
<td>11/2011-10/2015</td>
</tr>
<tr>
<td>Institute of Materials + VUJE, a.s.</td>
<td>OPVaV</td>
<td>26220220077</td>
<td>Increasing the power security of the Slovak Republic</td>
<td>07/2010-12/2013</td>
</tr>
<tr>
<td>Institute of Production Systems and Applied Mechanics</td>
<td>OP VaV</td>
<td>26220220055</td>
<td>Laboratory of flexible manufacturing systems with robotised manipulation supported by drawing-free production</td>
<td>01/2010-06/2012</td>
</tr>
<tr>
<td>Institute of Applied Informatics, Automation and Mathematics</td>
<td>OPV</td>
<td>26110220042</td>
<td>Implementation of the internal system of quality assurance in education</td>
<td>01/2012-12/2013</td>
</tr>
<tr>
<td>Institute of Applied Informatics, Automation and Mathematics + Qintec, s.r.o.</td>
<td>OPVaV</td>
<td>26220220159</td>
<td>Research into monitoring and assessing the non-standard states in the vicinity of a nuclear power plant</td>
<td>04/2012-09/2014</td>
</tr>
<tr>
<td>Institute/workplace</td>
<td>Operation programme</td>
<td>ITMS</td>
<td>Title of project</td>
<td>Time Period of Project</td>
</tr>
<tr>
<td>-------------------------------------------------------------</td>
<td>---------------------</td>
<td>-----------------------</td>
<td>------------------------------------------------------------------------------------------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Institute of Safety and Environmental Engineering</td>
<td>OP VaV</td>
<td>26220220056</td>
<td>Hybrid power supply for technical consultancy laboratory of utilisation and promotion of renewable energy sources</td>
<td>10/2010-03/2013</td>
</tr>
<tr>
<td>Institute of Industrial Engineering, Management and Quality</td>
<td>OPV</td>
<td>26110230055</td>
<td>Rationalisation and improvement of the industrial management study programme to support career guidance</td>
<td>01/2012-12/2013</td>
</tr>
<tr>
<td>Institute of Engineering Pedagogy and Humanities</td>
<td>OPV</td>
<td>26110230023</td>
<td>Developing the pedagogical competencies of the STU MTF PhD students</td>
<td>04/2010-12/2012</td>
</tr>
<tr>
<td>Division of Knowledge Management</td>
<td>OP VaV</td>
<td>26220220054</td>
<td>Centre of knowledge management of intellectual property</td>
<td>01/2010-06/2012</td>
</tr>
<tr>
<td>Division of Knowledge Management</td>
<td>OPV</td>
<td>26110230024</td>
<td>Knowledge Management system of tools for monitoring the graduates’ employability in the process of EU integration</td>
<td>04/2010-09/2012</td>
</tr>
</tbody>
</table>

OPVaV – Operation Programme Research
OPV – Operation Programme Education

This part of Annual Report 2012 was verified by Prof. Dr. Ing. Jozef Peterka

http://stu-mtf.pano3d.eu/
The Faculty of Materials Science and Technology (MTF) is accredited as a university type of institution. Having undergone a complex accreditation process in 2009, the Faculty obtained the right to grant the academic titles of “Bachelor” (Bc.), “Engineer” (Ing., corresponding to Master’s degree) and “Philosophiae Doctor” (Ph.D.). In 2012, the Faculty provided 9 Bachelor study programmes, 12 Master study programmes, and 9 Doctoral study programmes in both full-time and part-time study forms.

Accredited study programmes – Bc.
- Applied Informatics and Automation in Industry
- Materials Engineering
- Production Devices and Systems
- Computer-Aided Production Technologies
- Production Technologies
- Industrial Management
- Personnel Policy in Industrial Plant
- Quality of Production
- Occupational Health and Safety

Accredited study programmes – Ing.
- Applied Informatics and Automation in Industry
- Materials Engineering
- Processing and Application of Non-metals
- Production Devices and Systems
- Machining and Assembly
- Computer-Aided Design and Production
- Welding
- Industrial and Art Foundry
- Industrial Management
- Integrated Safety
- Teaching Specific Engineering Subjects
- Engineering of Production Quality

Accredited study programmes – PhD.
- Automation and ICT Implementation in Processes
- Materials Engineering
- Processing and Application of Non-metals
- Production Devices and Systems
- Industrial Management
- Integrated Safety
- Machining Technologies and Materials
- Didactics of Technical Professional Subjects
- Engineering of Production Quality

STUDY SYSTEM AND ORGANISATION

The credit system introduced at the Slovak University of Technology (STU) has been implemented in all three degrees of the university education at STU MTF, in compliance with the law and accreditation within the defined standard length of study for both full-time and part-time study forms.

Degree 1: Bachelor’s study, accomplished by granting the academic title of “Bachelor” - Bc. Having successfully passed the State exam and gaining the academic title of “Bachelor” (Bc.), the graduates can either continue the study at degree 2 level, or leave the Faculty.

Degree 2: Master’s study, accomplished by gaining the academic title of engineer – “Ing.” (corresponding to MSc.)

Degree 3: Doctoral study in both full-time and part-time forms. The defined standard length of study in full-time form is 3 years, in part-time form 5 years. The study is accomplished by gaining the academic title of “Philosophiae Doctor” – PhD.

All of the above-mentioned programmes can be studied either full-time or part-time.
INTEREST IN STUDY

The interest in study at the Faculty within individual degrees is quite stable. A decrease in the number of students admitted and enrolled was partially due to the changes introduced by the Ministry of Education of SR in financing universities, which consequently modified the policy of the Faculty management on the one hand, and also decreasing demographic curve and the increasing number of new universities and colleges in the Slovak Republic, on the other hand.

ADMISSION PROCEDURE VARIES ACCORDING TO THE DEGREE

The admission procedure for the Bachelor’s degree is based on applicants’ secondary school results, i.e. there is no entrance examination. The interest in study certified by participation in specialised competitions is an advantage for the applicants.

The admission procedure for the Master’s degree considers the results of the entrance examinations achieved in three profile subjects within the programme studied as well as overall study achievements of the Bachelor’s graduate.

The Faculty management perceive with satisfaction that, besides the STU MTF Bc. graduates interested in Master’s study, there is also a high number of candidates from other universities (Table.1), which is a proof of the high quality of the Faculty Master’s study programmes.

The admission procedure for the doctoral degree comprises of the entrance examination consisting of an interview regarding the chosen topic of the doctoral thesis and English for Specific Purposes test. The Faculty tends to increase the number of internal PhD students. The number of full-time PhD students (Graph No. 3) depends on the financial policy of the Ministry of Education, Science, Research and Sport of the Slovak Republic; the number of scholarships allotted to a university is based upon the criterion of its achievements in the field of research (domestic grants, foreign grants, internal PhD candidates having passed the dissertation exam, number of PhD graduates and the amount and quality of publications).

Study and teaching is guaranteed by the Faculty Institutes. Each Institute provides all three degrees of education.

The number of students at each Institute is illustrated in Graph 4.

Abbreviations used:
UIAM - Institute of Applied Informatics, Automation and Mathematics
UBEI - Institute of Safety and Environmental Engineering
UMAT - Institute of Materials
UPMK - Institute of Industrial Engineering, Management and Quality
UVTE - Institute of Production Technologies
UVSM - Institute of Production Systems and Applied Mechanics

Table 1. Master’s degree candidates: graduates of STU MTF and other universities in 2012

<table>
<thead>
<tr>
<th></th>
<th>MTF graduates</th>
<th>From other universities</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicants</td>
<td>592</td>
<td>97</td>
<td>689</td>
</tr>
<tr>
<td>Enrolled</td>
<td>476</td>
<td>61</td>
<td>537</td>
</tr>
</tbody>
</table>

Graph No. 1 Number of Bachelor’s degree candidates (applicants, admitted, enrolled) within the last four years

Graph No. 2 Number of Master’s degree candidates (applicants, admitted, enrolled) within the last four years

Graph No. 3 Number of PhD candidates (applicants, enrolled) in the last three years

Graph No. 4 Number of students by degree level within each Institute
Besides the above-mentioned facilities, students can take advantage of social scholarships and other bonuses such as the ones for study achievements and motivation, study loans and consultancy in the Career Centre. All of this is considered when designing time-tables, length of a training unit, arrangements of subjects, administration of the student agenda in AIS, PC connection, medical care and the possibility of arranging one’s matters in the Registrar’s and Academic Library on Saturdays. A psychologist was also employed to support spiritual and mental well-being of students by helping the students to handle critical situations and to adapt to the new academic environment.

The electronic questionnaire evaluating the level of education from the perspective of students available for completion during September to December 2011 was responded to by approximately 300 students of all study degrees. The Faculty management seriously deals with the students suggestions from the questionnaire and informs the students and teachers on possible solutions or improvements.

Besides study, the students can be involved in the institutional research activity either by participating in research projects and the Student Research Conference, or working as research student-helpers. The Student Research Conference provides the bachelor’s and master’s students with a chance to get acquainted with research methods, to analyse a research task and articulate the attained research results in both oral and written forms, and to defend their opinion in a professional forum. PhD students can present partial results of their research projects in the International Doctoral Seminar, an annual event organized by the Faculty and attended also by PhD students of foreign universities and research Institutes from home and abroad.

Besides the students of Slovak citizenship, there are also foreign students studying at STU MTF. Unfortunately, the Faculty is failing to attract a higher number of foreign students; their percentage is quite low so far.
### INSTITUTE OF SAFETY AND ENVIRONMENTAL ENGINEERING

#### Section: Chemical hazards and dangerous substances

**Winners**
1. Jana Drhová
2. Zuzana Blašková
3. Radka Štefániová

**Title of contribution**
1. Emergency planning in handling dangerous substances
2. Determining the ozone concentration in selected activities
3. Transport of dangerous materials excluded from the requirements of ADR agreement

**Supervisor**
Assoc.Prof.Ing. Ivana Tureková, PhD.
Ing. Adela Poliaková, PhD.

#### Section: Safety and Health

**Protection Winners**
1. Peter Kaiser
2. Lenka Lužáková
3. Miroslava Kotůčková

**Title of contribution**
1. Analysis of residual risks
2. Complex security assessment in production of ADLO doors
3. Health and safety in the production of steel constructions

**Supervisor**
Ing. Miroslav Slovák
Ing. Jozef Harangozó, PhD.
Ing. Tomáš Cerebet, PhD.

#### Section: Fire engineering

**Winners**
1. Marek Horúčka
2. Michal Kráľovič
3. Milan Derman

**Title of contribution**
1. Determining the effects of fire on the voltage decrease and insulation resistance of electric cables
2. Fire and technical characteristics of plastic packaging in retail chains
3. Automobiles of the fire and rescue brigades

**Supervisor**
Ing. Jozef Martinka, PhD.
Assoc.Prof.Ing. Ivana Tureková, PhD.
Assoc.Prof.Ing. Mikuláš Mončík, PhD.

### INSTITUTE OF APPLIED INFORMATICS, AUTOMATION AND MATHEMATICS

#### Section: Applied Informatics and Automation in Industry

**Winners**
1. Bc.Gabriel Gašpar
2. Bc. Ivan Pagáč
3. Bc. Adam Čelko

**Title of contribution**
1. Distributed system of temperature data collection
2. Design and implementation of an Information System (IS) supporting the property management
3. Samples positioning by means of a laser scanner

**Supervisor**
Ing. Michal Kebísek, PhD.
Assoc.Prof.Ing. Pavol Tanuška, PhD.
Ing. Michal Kopček, PhD.

### DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

#### Section: Humanities

**Winners**
1. Petra Ničková
2. Bc. Martina Deckárová
3. Bc. Martina Hudáková

**Title of contribution**
1. Motivating the STU MTF students toward better study achievements
2. Competency model for the study programme of personnel policy in an industrial plant
3. Supporting creativity of the STU MTF students

**Supervisor**
Ing. Veronika Horňáková
PhDr. Andrea Hagovská
PhDr. Andrea Hagovská

#### Section: English Language

**Winners**
1. Marián Hammel
2. Miroslav Lipovský
3. Míriama Kořínková

**Title of contribution**
1. Setting up a student business
2. Summer job opportunities for students
3. WolframAlpha webpage – a tool friend for students

**Supervisor**
Mgr. Gabriela Chmelíková, PhD.
PhDr. Emília Mironovová
Mgr. Gabriela Chmelíková, PhD.

### Events organised for potential and current STU MTF students in 2012:

<table>
<thead>
<tr>
<th>Date</th>
<th>Event Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01/2012</td>
<td>Open Day (Trnava)</td>
</tr>
<tr>
<td>02/2012</td>
<td>Open Day (Detached workplace in Komárno)</td>
</tr>
<tr>
<td>02/2012</td>
<td>Doctoral Students’ Week</td>
</tr>
<tr>
<td>03/2012</td>
<td>Student Research Conference 2012</td>
</tr>
<tr>
<td>03/2012</td>
<td>Presentation by Johnson Controls Trenčín, s. c.o. (job offer for graduates)</td>
</tr>
<tr>
<td>03/2012</td>
<td>Presentation by ESCAD Slovakia, s.c.o. (job offer for graduates)</td>
</tr>
<tr>
<td>03/2012</td>
<td>Presentation by PMP Montex s.c.o. (job offer for graduates)</td>
</tr>
<tr>
<td>03/2012</td>
<td>Presentation “Production systems in Volkswagen Slovakia”</td>
</tr>
<tr>
<td>03/2012</td>
<td>STU MTF promotion in secondary schools in Galanta, Myjava, Spišská Stará Ves, Zlaté Moravce, Nové Zámky and Vráble.</td>
</tr>
<tr>
<td>03-04/2012</td>
<td>Election to the Student Board of the SR Universities for the term of 2012-2014</td>
</tr>
<tr>
<td>04/2012</td>
<td>Presentation of TRW Automotive (Slovakia) s.c.o. (job offer for graduates)</td>
</tr>
<tr>
<td>04/2012</td>
<td>Discussion with a psychologist</td>
</tr>
<tr>
<td>04/2012</td>
<td>Excursion to Kia Motors Slovakia</td>
</tr>
<tr>
<td>04-08/2012</td>
<td>Competition of PhD students ”Innovation in the Automotive Sector 2012”</td>
</tr>
<tr>
<td>05/2012</td>
<td>International doctoral seminar</td>
</tr>
<tr>
<td>05/2012</td>
<td>Student questionnaire – print system</td>
</tr>
<tr>
<td>06-08/2012</td>
<td>Graduation of Master’s degree students</td>
</tr>
<tr>
<td>08-09/2012</td>
<td>Enrolments of new students</td>
</tr>
<tr>
<td>09/2012</td>
<td>Summer Olympic Games of secondary school students</td>
</tr>
<tr>
<td>10/2012</td>
<td>Presentation of Grand Power (JCI – Slovakia)</td>
</tr>
<tr>
<td>10/2012</td>
<td>Presentation of Lenovo (job offer for graduates)</td>
</tr>
<tr>
<td>10/2012</td>
<td>Evaluation of the student questionnaire on education quality for the academic year 2011/12</td>
</tr>
<tr>
<td>11/2012</td>
<td>Presentation by Ladislav Kossár</td>
</tr>
<tr>
<td>11/2012</td>
<td>Presentation by Ivo Toman</td>
</tr>
<tr>
<td>11/2012</td>
<td>Immatriculation of 1st year students</td>
</tr>
<tr>
<td>11/2012</td>
<td>STU MTF presentation at the European Education Fair ”Gaudamus” (Brno, Czech Republic)</td>
</tr>
<tr>
<td>12/2012</td>
<td>Commencement of the student questionnaire process</td>
</tr>
<tr>
<td>12/2012</td>
<td>SAIA information seminar at MTF</td>
</tr>
</tbody>
</table>

This part of Annual Report 2012 was verified by Assoc. Prof. RNDr. Mária Mišútová, PhD and Assoc. Prof. Ing. Peter Schreiber, PhD.
The research orientation of the Faculty of Materials Science and Technology corresponds with its pedagogic profile and the long-term orientation of STU. As amended by Section 30, Paragraph 1, Sub-paragraph c of Act 131/2002 of the Coll. relating to Universities and as amended by other acts, the Faculty Scientific Board evaluates the faculty's activity in the field of science and technology once a year.

RESEARCH FOCUS

The scientific and research activity of MTF STU research and pedagogical staff is carried out in the following forms:

- projects of basic research
- projects solved within international programmes
- projects of international collaboration
- projects of applied research and development
- projects of contractual research

The research content is focused on the following areas:

- materials research with a focus on the research, development and technological processing of the basic and new kinds of technical materials,
- research, development and optimisation of new technologies of industrial production oriented particularly on the technological processing of modern technical materials and ecologically clean processes and products, numerical simulation of technological processes
- process identification, automation and control, as well as information support for technological, production and organisation systems,
- research and verification of managerial control principles and their organisation structures,
- quality control and certification of processes and products,
- safety and reliability of technological equipment and systems, while emphasising the analysis methods and systems synthesis,

The STU Faculty of Materials Science and Technology in Trnava was evaluated in four areas of research in the complex accreditation of activities. The research areas related to the faculty study programmes are:

<table>
<thead>
<tr>
<th>Research area</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mechanical Engineering</td>
<td>A</td>
</tr>
<tr>
<td>Metallurgy and Materials</td>
<td>A</td>
</tr>
<tr>
<td>Information Sciences, Automation</td>
<td>B</td>
</tr>
<tr>
<td>and Telecommunication</td>
<td>B+</td>
</tr>
</tbody>
</table>

RESEARCH ACTIVITIES

In 2012, research projects under the VEGA, KEGA, APVV and other programmes were conducted at the faculty. The number of projects in 2012 from the particular agencies, grant schemes and contractual research are as follows:

<table>
<thead>
<tr>
<th>VEGA projects</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>(Basic research grant agency)</td>
<td>23</td>
</tr>
<tr>
<td>KEGA projects</td>
<td></td>
</tr>
<tr>
<td>(Cultural and education agency)</td>
<td>7</td>
</tr>
<tr>
<td>APVV (Agency for support of research and development)</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>7th framework programme</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Other foreign projects</td>
<td>1</td>
</tr>
<tr>
<td>Projects of contractual research</td>
<td>106</td>
</tr>
</tbody>
</table>
FOREIGN RELATIONS

STU MTF forms cooperation on the basis of good partnership relations which are typified by mutual cooperation, profit in the area of research activities, or experience in education. The active cooperation of our constitution, reflected in agreements concluded with foreign partners, is proof of the necessity for searching new partnerships and cooperation.

Institutes which signed contracts of cooperation with the Faculty:

Agreements on cooperation with Foreign Partners

<table>
<thead>
<tr>
<th>Foreign Partner</th>
<th>Country</th>
<th>City/Town</th>
</tr>
</thead>
<tbody>
<tr>
<td>Helmholtz-Zentrum Dresden</td>
<td>Germany</td>
<td>Dresden</td>
</tr>
<tr>
<td>Technical University of Brandenburg</td>
<td>Germany</td>
<td>Cottbus</td>
</tr>
<tr>
<td>Leibnitz-Institute for Solid State and Materials Research Dresden</td>
<td>Germany</td>
<td>Dresden</td>
</tr>
<tr>
<td>Anhalt University of Applied Sciences</td>
<td>Germany</td>
<td>Koethen</td>
</tr>
<tr>
<td>Faculty of Machining, University in Ljubljana</td>
<td>Slovenia</td>
<td>Ljubljana</td>
</tr>
<tr>
<td>St. Petersburg State University of Engineering and Electrotechnics</td>
<td>Russia</td>
<td>Saint-Petersburg</td>
</tr>
<tr>
<td>Institute of Energy in Moscow</td>
<td>Russia</td>
<td>Moscow</td>
</tr>
<tr>
<td>Bucher GmbH</td>
<td>Germany</td>
<td>Dusseldorf</td>
</tr>
<tr>
<td>Romanian Academy of Engineering and Pedagogy</td>
<td>Romania</td>
<td>Bucharest</td>
</tr>
<tr>
<td>Faculty of Applied Informatics and Robotechnology, UGATU</td>
<td>Romania</td>
<td>Bucharest</td>
</tr>
<tr>
<td>Faculty of Economics, Management and Finances, UGATU</td>
<td>Romania</td>
<td>Bucharest</td>
</tr>
<tr>
<td>National Institute of R &amp; D for Materials Physics</td>
<td>Romania</td>
<td>Bucharest</td>
</tr>
<tr>
<td>Faculty of Physics, University of Bucharest</td>
<td>Russia</td>
<td>Saint-Petersburg</td>
</tr>
<tr>
<td>University of Science and Technology in Pohang</td>
<td>South Korea</td>
<td>Pohang</td>
</tr>
<tr>
<td>Faculty of Organisation and Informatics, University of Zagreb</td>
<td>Croatia</td>
<td>Zagreb</td>
</tr>
<tr>
<td>Bekaert</td>
<td>Belgium</td>
<td>Zwevegem</td>
</tr>
<tr>
<td>Faculty of Machine Building, Technical University of Cluj-Napoca</td>
<td>Romania</td>
<td>Cluj-Napoca</td>
</tr>
<tr>
<td>Institute of Technology ČVUT Prague</td>
<td>Poland</td>
<td>Prague</td>
</tr>
<tr>
<td>University of Miskolc</td>
<td>Czech Republic</td>
<td>Prague</td>
</tr>
<tr>
<td>Institute for Systematic Coaching and Organisation Advisory</td>
<td>Hungary</td>
<td>Miskolc</td>
</tr>
<tr>
<td>Faculty of Economics and Management</td>
<td>Germany</td>
<td>Berlin</td>
</tr>
<tr>
<td>Faculty for Management</td>
<td>Poland</td>
<td>Zielona Góra</td>
</tr>
<tr>
<td>Faculty of Information Technologies and Telecommunication of North-Caucasian State Technical University</td>
<td>Serbia</td>
<td>Novi Sad</td>
</tr>
<tr>
<td>Amirkabir University of Technology</td>
<td>Russia</td>
<td>Stavropol</td>
</tr>
<tr>
<td>Kalashnikov Izhevsk State Technical University</td>
<td>Islamic Republic of Iran</td>
<td>Teheran</td>
</tr>
<tr>
<td>Hochschule Mannheim University of Applied Sciences</td>
<td>Russia</td>
<td>Izhevsk</td>
</tr>
<tr>
<td>Vocational Higher Education School in Sulechów</td>
<td>Germany</td>
<td>Mannheim</td>
</tr>
<tr>
<td>Poland</td>
<td>Poland</td>
<td>Sulechów</td>
</tr>
</tbody>
</table>

STUDENT EXCHANGES

STU MTF students participate in exchange programs of short-term and also long-term scholarships. In 2012, the Faculty had 32 agreements in the Erasmus programme. The dominant Erasmus partners are the institutions in Poland (9 agreements), Germany (5 agreements), Czech Republic (3 agreements), and Croatia (3 agreements).

BUSINESS TRAVELS AND FOREIGN GUESTS

Development of relations with international partners in the last three years is reflected in the number of foreign guests and business travels of the Faculty employees to foreign institutes.

MEMBERSHIP OF SLOVAK AND INTERNATIONAL ORGANISATIONS

On an international level, the faculty cooperated with significant scientific and technical organisations in the last year. STU MTF is an institutional member of five professional international institutions. Employees of the faculty are active in different Slovak (139 individual memberships) and also international organisations (49 individual memberships) in different positions, from members to chairs, vice-chairs and members of boards.

Membership of international professional organisations

- International Institute of Welding
- Association for Heat Treatment of Metals
- International Society for Engineering Pedagogy
- European Platform of Women Scientists
- European Network Education and Training in Occupational Safety and Health
- European Alliance for Innovation

Memberships of Slovak professional organisations

- Scientific Society for Metals
- Slovak Natural Gas and Crude Oil Union
- Slovak Chamber of Commerce and Industry
- Slovak Society for Quality
- Automobile Cluster
- Slovak Society of Ergonomics
- Slovak Society of Maintenance
- Slovak Association of Libraries
- Slovak Society for Cybernetics and Informatics
- Slovak Academy of Sciences
- Association of Machining Industry of the Slovak Republic
According to the Act No. 131/2002 of Coll. relating to universities and modification, and completion of some laws as amended, the Faculty of Materials Science and Technology, Slovak University of Technology in Bratislava is entitled to carry out habilitation process and academic promotion of professors in the following study fields:

5.2.7. Mechanical Engineering and Materials
5.2.14. Automation
5.2.26. Materials
5.2.50. Production Technologies
5.2.52. Industrial Engineering
8.3.5. Occupational Health and Safety

NEW DOCTOR HONORIS CAUSA, VISITING PROFESSORS AND ASSOCIATE PROFESSORS IN 2012

Doctor honoris causa (Dr.h.c.)

Prof. Dr. Ing. habil. Jürgen Eckert
Prof. Dr. Ing. Norge Isaias Coello Machado

Visiting professors

Dr. rer. nat. Andreas Kolitsch
Ing. Peter Podnek, PhD.
Ing. Ľudovít Kupča, CSc.

Associate Professors

Assoc. Prof. Ing. Štefan Václav, PhD.
Assoc. Prof. Ing. Sebastian Saniuk, PhD.

Assoc. Prof. Ing. Maximilián Strémy, PhD.
Assoc. Prof. Ing. Krzysztof Witkowski, PhD.
ACTIVITIES IN 2012:

02/2012 – Presentation of the STU MTF research profile in a special issue of Productivity and Innovation Journal
02/2012 – Introduction of the TelePresence network of Slovak universities (including MTF)
03/2012 – Co-organisation of trainings with Thomson Reuters (Bratislava)
04/2012 – Opening of a joint research workplace with STU MTF and UMMS SAV oriented on the preparation of special kinds of metallic and ceramic materials
05/2012 – Workshop on progressive methods and technologies of preparation, processing and diagnostics of materials (Bratislava)
06/2012 – STU Rector, Prof. Ing. Robert Redhammer, PhD. awarded grants to young researchers of STU within the Program for the support of young researchers. The following grants were allotted to STU MTF:

- Study of ozonisation of the process liquids utilisation and disposal
  Ing. K. Gerulová, PhD.
- Security of information assets as an integral part of a quality management system in compliance with the principles of CSR
  Ing. J. Urdziková, PhD.
- Generating the optimum trajectory of a robotic arm in an iCub robotic simulator by using GPU
  Ing. P. Bezák, PhD.
- Mechanical properties of hybrid adhesion-laser joints of thin metal sheets
  Ing. I. Michalec
- Design implementation of a virtual model of electro-hydraulic drive
  Ing. J. Fiša, PhD.
- Developing software for the calculation of the total effectiveness index of equipment regarding employees motivation
  Ing. J. Dražňovský, PhD.
- Welding the magnesium and other light metals alloys by laser beam
  Ing. T. Kramár
- Monitoring the process of self-heating of unsaturated oils by means of SEDEX safety calorimeter
  Ing. I. Hrušovský

10/2012 – Co-organisation of an IEEE English for Engineering seminar “Drills and Skills” (Bratislava)
11/2012 – Participation in the exhibition within the Week of Science and Technology in Slovakia in 2012 (Bratislava)
12/2012 – Agreement on co-operation between the education institution of Gomel State University and STU MTF
12/2012 – Granting the title of Scientist of the Year 2012 to Prof. Ing. Jozef Janovec, Dr.Sc. of STU MTF

This part of Annual Report 2012 was verified by Prof. Ing. Peter Grgač, PhD.
**AWARDS IN 2012**

07/2012 - Dr. Rudolfo Ortiz, Minister of the Higher Education of the Cuban Republic and Professor Dr. Andres Alegria, His Magnificence and Rector of Universidad Central Marta Abreu de las Villas/Cuba conferred a decree to enable **Professor Oliver Moravčík**, STU MTF Dean to act as a visiting Professor at the Universidad Central Marta Abreu de las Villas/Cuba. The decree was granted by Professor Dr. Angelo Rodriguez, Dean of the Faculty of Mechanical Engineering, Universidad Central Marta Abreu de las Villas/Cuba.

11/2012 – Award and diploma for the best presentation from the “Centres of Excellence” in 2012, the highest award of the “Week of Science and Technology in Slovakia in 2012”.

12/2012 – Professor of the year in STU MTF 2012 is awarded to Professor Velišek. His Magnificence Robert Redhammer, STU Rector bestowed the highest award of the Slovak University of Technology “Professor of the year 2012” to Professor Karol Velišek, Director of the STU MTF Institute of Production Systems and Applied Mechanics for his year-long activity in the field of international co-operation and grant achievements. In 2012, Professor Velišek was also awarded a title of Prof.h.c. by the Technical University in Cluj-Napoca/Romania.

12/2012 – Professor Jozef Janovec became the STU MTF Scientist of the Year 2012. Professor Janovec and his team investigate complex metal with the properties different from those of conventional metal alloys.

12/2012 – During the 25th anniversary of the Faculty, the MTF management awarded the employees who contributed to the Faculty development since its establishment. Dean Prof. Moravčík, Vice-Dean Assoc. Prof. Vidová and Assoc. Prof. Bilík, chair of the Staff Board, thanked the awardees for their year-long work.

MTF employees working 25 years for STU:
- Mária Klobučiaková
- Ing. Marta Kučerová, PhD.
- Ján Kubovič
- Emília Minačková
- Štefánia Viteková
- Bc. Beňa Vrbovská
- Ing. Jozef Charbula
- Assoc. Prof. Ing. Peter Svrčko, CSc.

01/2013 New Year meeting:
At the 75th anniversary of STU, the STU Rector awarded the "Commemoration Letter of Tree of Knowledge" to the following STU MTF Professors: Karol Balog, Ivan Baránek, Dušan Baran, Peter Grgač, Alexander Caus, Jozef Janovec, Peter Juči, Ján Lokaj, Oliver Moravčík, Milan Marošek, Milan Olšvold, Jozef Peterka, Jozef Sablík, Peter Sakáľ, Peter Šugár, Milan Turňa, Koloman Ulrich, Miroslav Urban and Karol Velišek.
The best dissertation thesis
Ing. Tomáš Škulařík, PhD. (Institute of Applied Informatics, Automation and Mathematics): Fuzzy control of a robotic arm

The best publication of MTF STU
The best publication issued in a renowned journal with an impact factor of 2.289:

The contribution is registered in the following databases: Web of Science, Master Journal List and Scopus.

The best co-operation with practice
The Faculty management awarded Assoc. Prof. Ing. Lubomír Caplovčík, PhD (Institute of Materials) for the best results achieved in co-operation with practice.

Awards of other entities:

Orange Slovakia, a.s. Bratislava awarded the following STU MTF employees in 2012: For publications in the field of applied informatics and automation:
Assoc. Prof. Ing. Pavol Vajzán, PhD. (Institute of Applied Informatics, Automation and Mathematics)

For successful project activities in the field of applied informatics and automation:
Ing. Tomáša Bezáká, PhD (Institute of Applied Informatics, Automation and Mathematics)

IGIP (Austria)
IGIP Award (Austria) for 2012 was granted to Prof. Dr. Ing. Oliver Moravčík, Faculty Dean.

ACTIVITIES OF THE PUBLIC RELATIONS DIVISION IN 2012
- providing a virtual sightseeing tour of STU MTF
- providing English translations of key parts of the Faculty website
- video a monthly schedule of the Faculty events
- promotion materials
- innovation of poster exhibition
- implementation of the STU and MTF logo redesign
- responsibility for updating the Faculty website, monitoring the news about MTF in the media
- updating the Faculty photo gallery
- establishment of the Technology Museum

- activities related to promotion of the Faculty in the media
- organisation of exhibitions at the International Engineering Fair in Brno/Czech Republic, Exhibition of Centres of Excellence in Bratislava, exhibition of photographs at STU MTF
- organisation of the regular Thursday afternoon meetings
- activity for the civic association Bank of Quality – Alumni MTF
- production of invitations, business cards and posters
- regular announcements in print media (Spektrum, Trnavský hlas, Novinky z radnice, Produktivita a inovácie)
- video recordings of events
- preparing Faculty events (New Year Meeting, MTF Day, St. Nicolas Day, International Children Day)
- preparing data for the documentary "Spectrum of Science"
- formatting and redesigning the website of the Public Relations division (including presentation map)

SOCIAL PROGRAMMES FOR EMPLOYEES OF THE FACULTY OF MATERIALS SCIENCE AND TECHNOLOGY
MTF STU creates the following conditions of social policy for employees according to their rights defined in legislation. The management of MTF STU is interested in employee opinions. Every year a survey is prepared to obtain feedback as a tool to decide about future changes. The Faculty management discusses the results of the survey (which are available for the public) and new measures are created on the basis of the satisfaction survey.

EMPLOYEE BOARD OF MTF STU
The employee board of MTF STU was established at the Faculty after elections in June 2009 for the period of four years. It represents the interests of all employees in accordance with valid labour codes and the collective labour agreement.

The representatives on the employee board of MTF STU took part in all meetings of the Faculty management, the collegium of the dean, in meetings of UOO STU in Bratislava and in job interviews for pedagogical positions during the year. The board participated in the schedule creation for use of the gymnasium and swimming pool with employees of MTF STU and the preparation of the canteen menu; it took part as well in a petition organisation for use of the gymnasium and swimming pool during the year. The board participated in the schedule creation for use of the gymnasium and swimming pool during the year. The board participated in the schedule creation for use of the gymnasium and swimming pool during the year. The board participated in the schedule creation for use of the gymnasium and swimming pool during the year.

The employee board of MTF STU:
- discussed all materials dealing with holiday planning, collective holidays, a directive of the dean regarding application for social fund resources and others.
- discussed all applications for prolonging employment, termination of working relationships because of redundancy after the implementation of the automatic call centre
- approved grants from the social fund in agreement with the union contract from 2011
- participated in evaluation of adherence to the collective labour agreement terms as well as preparation of a new collective labour agreement for 2012 in the form of comments to a draft and completion of the draft
- submitted ideas of Faculty employees for solving problems on particular panels.

The Faculty management and the Academic Senate approved the following documents in 2012:
- Code of Ethics of an STU MTF employee
- Code of Ethics of an STU MTF student

SECURITY SYSTEM
Status in the area of work accident risks, illnesses caused by work, dangerous events and dangerous industrial accidents:

Status of working conditions (following the rules):
- creation of a new directive by the dean No. 8/2008 on “Work and workplaces which are forbidden to pregnant women and mothers to the end of the ninth month after giving birth, and breastfeeding women,”

- the categorisation of work from the perspective of health risks.

Personnel and protection of working appliances:
- the list of working activities,
- the report on the state of technical equipment and control, revision and repair

Areas for the training of Work Safety and Health Protection employees and creation of rules:
- admission training – 60 employees
- periodical training of employees – 167 employees
- training of management - 20 employees
- the induction information for students during the enrolment process
- training of employees to provide first aid – 21 em employees
- the list of working activities,
<table>
<thead>
<tr>
<th>MONTH</th>
<th>DATE</th>
<th>EVENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>January</td>
<td>01/01/2012</td>
<td>Establishment of new workplaces: The Department of Humanities and Social Sciences and the Department of Engineering Pedagogy</td>
</tr>
<tr>
<td></td>
<td>18/01/2012</td>
<td>Visit of His Magnificence, Rector of University of Trnava, Professor Marek Šmid</td>
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<tr>
<td></td>
<td>19/01/2012</td>
<td>New Year Meeting</td>
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<td></td>
<td>26/01/2012</td>
<td>Open Day</td>
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<td></td>
<td>30/01-03/02/2012</td>
<td>Week of Doctoral Students</td>
</tr>
<tr>
<td>February</td>
<td>01/02/2012</td>
<td>New logo of STU MTF</td>
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<tr>
<td></td>
<td>08-10/02/2012</td>
<td>Final conference of the Autoclusters project</td>
</tr>
<tr>
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<td>10/02/2012</td>
<td>Establishment of a research centre at the Institute of Safety and Environmental Engineering</td>
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<tr>
<td></td>
<td>15/02/2012</td>
<td>Open Day at a detached workplace in Komárno</td>
</tr>
<tr>
<td></td>
<td>17/02/2012</td>
<td>Dies Iovi Occursus</td>
</tr>
<tr>
<td></td>
<td>20/02/2012</td>
<td>Introduction of TelePresence web</td>
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<tr>
<td></td>
<td>27/02/2012</td>
<td>Questionnaire on the topic of MTF employee satisfaction</td>
</tr>
<tr>
<td></td>
<td>27/02/2012</td>
<td>Open Day</td>
</tr>
<tr>
<td></td>
<td>28/02/2012</td>
<td>Meeting with Bauer Gear Motor GmbH</td>
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<tr>
<td></td>
<td></td>
<td>Productivity and innovation - MTF presentation</td>
</tr>
<tr>
<td>March</td>
<td>01/03/2012</td>
<td>“Webometrics Ranking of World Universities” – STU in the first 500th</td>
</tr>
<tr>
<td></td>
<td>06/03/2012</td>
<td>Presentation on “Production systems in Volkswagen Slovakia”</td>
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<td></td>
<td>07/03/2012</td>
<td>Presentation by MP Montex s r.o.</td>
</tr>
<tr>
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<td>10-11/03/2012</td>
<td>38th year of the Grand Prix of swimming in Trnava</td>
</tr>
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<td>22/03/2012</td>
<td>Dies Iovi Occursus</td>
</tr>
<tr>
<td></td>
<td>27/03/2012</td>
<td>Presentation by ESCAD Slovakia s r.o.</td>
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<tr>
<td></td>
<td>27/03/2012</td>
<td>Discussion: Meetings with practice</td>
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<tr>
<td></td>
<td>28/03/2012</td>
<td>Presentation by Johnson Controls Trenčín, s r.o.</td>
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<tr>
<td></td>
<td>29/03/2012</td>
<td>Student Research Conference</td>
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<tr>
<td></td>
<td>30/03/2012</td>
<td>MTF Day</td>
</tr>
</tbody>
</table>
April

02/04/2012  Opening a joint workplace of STU MTF and the Institute of Materials and Machine Mechanics, Slovak Academy of Sciences
03/04/2012  Seminar delivered by ESAB, Electric Welding Limited company, Sweden
12/04/2012  Dies Iovi Occursus
17 - 18/04/2012  STU Rector’s Cup
25/04/2012  Presentation delivered by TRW Automotive s.r.o, Slovakia
26 - 27/04/2012  “Production and defects of toothwheels and gears” Conference

May

03/05/2012  Dies Iovi Occursus
04/05/2012  Day of the Institute of Industrial Engineering, Management and Quality
10/05/2012  Workshop entitled “Progressive methods and technologies of preparing, processing and diagnosing materials”
20 - 22/05/2012  International Doctoral Seminar 2012
23 - 25/05/2012  A series of presentations delivered by Prof. Stanislav Karapetrovič, PhD, PEng. of University in Alberta (Canada) on “Quality and evaluation of university teachers and teaching in Canada”
24/05/2012  IVth Pedagogy Conference

June

01/06/2012  Presentation delivered by TRUMP Co.
01/06/2012  Deadline for Master’s study applications
02/06/2012  International Children Day in MTF
04 - 08/06/2012  3rd series of lectures delivered by Prof. Klaus Wetzig of IFW Dresden
15/06/2012  Deadline for PhD study applications
22/06/2012  Teachers Cup
25/06/2012  Professor Dr. Ing. habil. Jürgen Eckert from the partner research institute IFW Dresden is awarded the title of Doctor honoris causa
25/06/2012  75th Anniversary celebration of the STU establishment
27/06/2012  Approval of the strategic document “A long-term plan for the period of 2012 – 2017”
28/06/2012  Agreement of co-operation between Kalashnikov Izhevsk Technical University and STU MTF
29/06/2012  Virtual sightseeing of STU MTF “goes live” on the website
29/06/2012  On behalf of STU Professor Redhammer, STU Rector, Professor Moravčík, Faculty Dean, granted a high university award , “Plaque of STU” to Professor Gyula Patkóo, Rector of University of Miskolc
29/06/2012  Graduation ceremony of Master’s study graduates
July
02 - 06/07/2012  Graduation ceremony of Master’s study graduates
04/07/2012  Professor Moravčík acquired a position of a visiting professor at Universidad Central Marta Abreu de las Villas/Cuba
07/07/2012  Annual meeting of Associated Phase Diagram and Thermodynamics Committee
27/07/2012  Visit from top representatives of CARL ZEISS/SRN Poland, Czech Republic and Slovakia, Dr. Andreas Mohr, Ing. Karl Tillinger, Ing. Marián Stažovský and Ing. Tomáš Šimko
27/07/2012  Visit of His Excellency Vladimír Serpikov, Ambassador of the Republic of Belarus

August
31/08/2012  Closure of the department of Engineering Pedagogy

September
04/09/2012  Summer university of secondary school students at STU MTF
05 - 08/09/2012  Forming 2012 conference
10 - 14/09/2012  MTF exhibition at the International Engineering Fair in Brno
24/09 - 22/12/2012  Teaching period for winter semester of the academic year 2012/2013

October
04/10/2012  Regional power sources – presence and future (scientific conference)
09 - 11/10/2012  Akadémia & Vapac Fair, Bratislava
11 - 12/10/2012  COMATTECH 2012 conference
18/10/2012  Presentation by representatives of Lenovo Co.
22/10/2012  Dialogues with practice, Ing. Peter Čirka
24/10/2012  Presentation delivered by Jaroslav Kuracina (JCI Slovensko)
25/10 - 02/11/2012  Exposition of photographs “Behind the Faculty gate” in Max Trnava supermarket
30/10 - 02/11/2012  Gaudeamus Brno 2012
November

06,11,13,20,27/11/2012 Live discussion with the management about development of the Faculty shown on regional TV
06/11/2012 Immatriculations
07 - 11/11/2012 Presentation of STU MTF at the exposition of “Centres of Excellence” within the Week of Science and Technology in Slovakia 2012
08/11/2012 Dies Iovi Occursus
15 - 16/11/2012 7th Seminar for Central European PhD Students - Research in Materials Science
15/11/2012 Agreement of co-operation between the Education Institute of Gomel State University and STU MTF
16/11/2012 Lecture delivered by Ladislav Kossár
28 - 30/11/2012 CECOL 2012

December

01/12/2012 St. Nicholas Day for children of STU MTF employees
04/12/2012 Information seminar by SAIA
04/12/2012 Live discussion with the management about development of the Faculty shown on regional TV
05/12/2012 Results published of ARRA evaluation – STU MTF ranked in 6th position among technical faculties in SR
06/12/2012 Christmas bazaar
07/12/2012 Christmas concert of VUS Technik STU in Bratislava
10/12/2012 Granting of the title Dr.h.c., the highest university award, to Professor Norge Isaias Coello Machado of the partnering Universidad Central Martha Abreu de las Villas - Santa Clara/Cuba.
11/12/2012 25th anniversary of the STU MTF establishment
11/12/2012 25th anniversary event of the STU MTF establishment including awards to employees
13/12/2012 Professor of the Year – Prof. h.c. Prof. Ing. Karol Veľšek, PhD. of STU MTF
13/12/2012 Scientist of the Year – Prof. Ing. Jozef Janovec, DrSc. Z MTF STU
18/12/2012 Concert of “Technik” ensemble at the Christmas market, a gift of STU MTF for the city of Trnava
On 19.3.2011 the civil association Bank of Quality – Alumni MTF STU was established. This association creates space and conditions for Faculty communication with former graduates.

Activities of Alumni in 2012:
- meeting of the general assembly of the association
- English translation of the association website
- electronic journal of the association established
- newsletter sent to the registered members of the association
- lecture delivered on the topic of “Advanced Software Testing” in co-operation with UIAM (10/2012)
- reunion of the graduates at UPMK

The aim of editorial activity at MTF STU is to secure the fast transfer of results of research knowledge development and education into syllabi via publications, and to enable access of students to new knowledge and improve the teaching process.

Editorial activity has an important role, especially from the perspective of publication activities of Faculty authors, and it has significant importance for the Faculty.

In 2012 a new portal for publishing was initialised at the Faculty.

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By making a contribution to this account number, you can support the activity of the “Civic Association of graduates and friends of STU MTF Bank of Quality – Alumni MTF STU”.

Editorial activities in 2012
- editorial activities in the field of electronic textbooks, scientific monographs, MTF journals and proceedings
- processing of Faculty journals in Versita system (journals are indexed in the following databases: RePeC, Astrophysics Data System, INSPEC and TEMA)
- amending the statute of editorial activities, including the administration of anonymous reviewing
- update and administration of the portal publishing at MTF STU
- English translation of journal research papers
- mapping the publication space of STU MTF on Pearson and Cengage Publishing Houses websites
- implementation of custom publishing processes at MTF
- provision of updates to the Slovak language section of the Faculty website
- format and modification to MTF STU webpage of AlumniPress Publishing House

The number of published publications at MTF STU in 2012

<table>
<thead>
<tr>
<th>Monographs</th>
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<tr>
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Periodical publications of MTF STU in 2011

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<th>Number of volumes</th>
<th>Number of contributions</th>
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<tr>
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INSTITUTE OF MATERIALS SCIENCE

STAFF

- Professors: 8
- Assoc. Professors: 9
- Senior Lecturers: 17
- Research Fellows: 7
- PhD Students: 36

ACTIVITIES OF THE INSTITUTE

27/02/2012 - Meeting with Bauer Gear Motor GmbH
10/05/2012 - Workshop on the topic of “Progressive methods and technologies for the preparation, processing and diagnostics of materials”
03 - 04/06/2012 - 3rd series of lectures by Prof. Klaus Wetzig of IFW Dresden, on the topic of “Ion Beams in Materials Processing and Analysis”
07/07/2012 - APDTC Conference - Annual Meeting of Associated Phase Diagram and Thermodynamics Committee
09 - 14/09/2012 - Presentation of the “Centre of Excellence” at the International Engineering Fair in Brno (Czech Republic)
07 - 09/11/2012 - Exhibition of “Centres of Excellence” within the “Week of Science and Technology in Slovakia in 2012”
15 - 16/11/2012 - 7th year of the seminar for PhD students from central Europe – Research in Materials Engineering
20/11/2012 - CE Presentation for the Faculty documentary “Spectrum of Science”
06/12/2012 - “Scientist of the Year at STU 2012” is awarded to Prof. Ing. Jozef Janovec, DrSc.

EDUCATION AT THE INSTITUTE

STUDY PROGRAMMES

- Materials Engineering
- Processing and Application of Non-Metals

Number of the students (as at 31.10.2012) registered on study programmes offered by the institute: 451
Number of graduates (2011/2012) of the study programmes offered by the Institute: 77

CONTACT

Director Prof. Ing. Jozef Janovec, DrSc.
e-mail: jozef.janovec@stuba.sk
tel.: +421918646072
Address Jáná Bottu 25, 917 24 Trnava, Slovak Republic
tel.: +421918646038
fax: +421906068499
GRADUATE PROFILE

BACHELOR PROGRAMMES (Bc.)

Materials Engineering
The graduate from the programme will have gained a complete Bachelor’s degree in the field of Materials Engineering. The graduate will understand production, testing, technological processing, selection, exploitation and degradation of properties of main kinds of technical materials. Upon completion of the degree the graduate will have developed the scope of the notions, principles and theory regarding technical materials, production technology, processing technology, application and recycling of materials, as well as fundamentals of electrical engineering, construction, informatics and management of industrial company. Furthermore, they will be able to specify mechanical properties of materials and work with equipment used in mechanical and defecto-critical tests of materials, evaluate the structure of materials by standard procedures with the use of corresponding equipment and methods. The graduate will be conscious of the social, moral, legal and economic impact of his or her chosen profession and will be prepared either for master’s study in the field of Materials and related study fields or for entering the job market immediately. The qualification will equip the graduate with the skills to successfully operate in industrial companies in the field of technical materials, technological processing of semi-products and products, as well as in the fields of quality control, purchasing and selling materials, service and maintenance.

MASTER’S PROGRAMMES (Ing.)

Materials Engineering
The graduate will gain a complete Master’s degree education in the field of Materials focused on technical materials. The graduate will understand the development and production of technical materials, the technological processing of semi-products and products, as well as quality control and operating diagnostics, connections within chemical composition, structure and the technically important properties of materials. Furthermore, the graduate will develop his or her knowledge of production, processing, quality control, application and recycling of materials, methods, techniques and means of property analysis, selection and implementation of materials. The graduate will be prepared to gain a further scientific perspective across a wide range of technical fields, apply a wide spectrum of experimental methods of study and properties of materials in solving tasks in engineering practice. Through the analysis of the individual and team scientific work, the graduate will be conscious of the social, moral, legal and economic impact of his or her profession and will be prepared to gain a further scientific perspective across a wide range of material research fields, in order to widen his or her own knowledge in the field, or to enter the job market immediately. The graduate will successfully operate in industrial companies or specialized companies in the field of production or technological processing of materials or technological processing of semi-products and products.

POSTGRADUATE PROGRAMMES (PhD.)

Materials Engineering
The graduate will master the rules of scientific work in the field of Materials and will obtain a doctoral degree education in the field of Materials. The graduate will be prepared to discover and propose his or her own solutions to problems, learn to formulate problems scientifically and present his or her own results. They will be equipped with the skills to gauge legal and environmental aspects, ethical and social aspects of scientific work and will become familiar with scientific methods of research and development as well as processes leading to his or her problem solving in the field of technical materials. The graduate will master the rules of individual and team scientific work, scientific formulation of problems, ethical and social aspects of scientific work and the effective presentation of research results. In doing so, they will understand the relationships between research, development and production, technological processing and recycling, aspects of research and development of new materials and legal and environmental aspects of new products. Upon completion of the study programme the graduate will be conscious of the social, moral, legal and economic impacts of his or her profession and will be prepared to gain a further scientific perspective across a wide range of material research fields, in order to widen his or her own knowledge in the field, or to enter the job market immediately. The graduate will successfully operate in industrial companies or specialized companies in the field of production or technological processing of materials or technological processing of semi-products and products.

LIST OF SUBJECTS GUARANTEED WITH THE INSTITUTE

- Advanced materials and technologies
- Bachelor’s project
- Bachelor’s knowledge of non-metallic materials
- Data processing and simulation
- Degradation processes and prediction of lifetime
- Diploma project
- Diploma thesis
- Dissertation project
- Electrotechnics and electronics
- Engineering experiment
- Experimental methods of materials investigation
- Heat treatment of materials
- Heat treatment technology
- Chemical heat treatment
- Materials in power engineering
- Materials science
- Mechanical testing and defecto-critical materials
- Methods in research of material structure and properties
- Methods of materials investigation
- Metrology and testing of plastics
- Modelling of phase equilibria
- Non-metallic materials
- Pedagogic activities
- Physical measurement methods of non-metallic materials
- Physics
- Processing technologies of non-metallic materials
- Professional practice
- Research paper
- Selected topics in advanced technologies of non-metallic materials
- Selected topics in ceramic and glass materials
- Selected topics in electrical and optical properties of non-metallic materials
- Selected topics in materials based on polymers
- Selected topics in mechanical and thermal properties of non-metallic materials
- Selected topics in modeling and optimisation properties of non-metallic materials
- Selected topics in solid state physics
- Selected topics in surface engineering
- Selected topics in mechanical and thermal properties of non-metallic materials
- Sturcture and properties of non-metallic materials
- Technology of materials production
- Theory and technology of ceramic materials processing
- Theory and technology of glass processing
- Theory and technology of plastics processing
- Theory of materials production
- Theory of phase transformations
- Utility properties and materials design
- Vacuum engineering and technology
- Methods in research of material structure and properties
- Methods of materials investigation
- Metrology and testing of plastics
- Modelling of phase equilibria
- Non-metallic materials
- Pedagogic activities
- Physical measurement methods of non-metallic materials
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- Processing technologies of non-metallic materials
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- Theory and technology of glass processing
- Theory and technology of plastics processing
- Theory of materials production
- Theory of phase transformations
- Utility properties and materials design
- Vacuum engineering and technology

GRADUATE THESIS

Bachelor Theses
Babinec, M.: Properties of diffuse boronised cold work K245 steel
Bilicky, M.: Rheology of biodegradable plastics
Borko, P.: Analysis of components damaged during hot isostatic pressing
Borko, P.: Material analysis of safety significant components in a nuclear power plant
Csemó, M.: Mechanical properties of composite Al-SiC panels
Demeter, J.: Preparation and analysis of chromium nitride coatings on tool steel
Gábor, A.: Microstructure degradation of intermetallic TiAl alloys during creep
Gondek, J.: Metallographic analysis of steel knives blades from 13th to 18th century
Kamenický, M.: Mechanical testing of lead-free soldered joints
Kollaroslová, A.: Structural study of the bimetallic interface: ductile iron – CuSn6 with electron microscopy and EDX microanalysis
Komářanský, R.: Monitoring of electrical parameters of special glass
Koštál, T.: Influence of diffuse boronising on the properties of steel K 720
Kusťán, M.: Effect of flavoring elements Ca and Al SiC in the melt viscosity
Kvasnovský, R.: Metallographic analysis of heat affected zones of high strength aluminium solutions prepared by rapid solidification from melt
Lašček, L.: Measurement and analysis of thermophysical properties of technical materials
Máčka, R.: Influence of composition rubber blends on curing rate
Polaková, F.: Analysis of carbonbrided structural steels by means of light microscopy
Sabová, D.: Analysis of welding joints on high strength steels created by explosion welding

Košćim, M.: Mechanical properties of composite Al-SiC panels
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Máčka, R.: Influence of composition rubber blends on curing rate
Polaková, F.: Analysis of carbonbrided structural steels by means of light microscopy
Sabová, D.: Analysis of welding joints on high strength steels created by explosion welding
**RESEARCH AT THE INSTITUTE**

**Areas of Research**
- advanced complex metallic alloys and other structurally complex materials
- alloy steels for energy industries
- laser hardening of selected materials
- materials with non-crystalline structures
- computational chemistry in materials science
- thermodynamic modelling of phase equilibria and processes in materials
- coatings and surface treatment

**Research characteristics**

The research activities of the Institute of Materials Science are focused on crystallisation and heat treatment of metals and alloys, tool materials, powder metallurgy, stainless steels, steels for power plants, weldability of steels, lead-free solders, wear-resistant coatings, complex metallic alloys, processing of polymers and properties of special glasses. At present, the Institute possesses three internal laboratories (Laboratory of Structural Analysis, Laboratory of Heat Treatment and Mechanical Testing, Laboratory of Physical-Chemical Measurements and Processes) and three laboratories with external partners (Laboratory of Thermophysical Measurements and Calculations, Laboratory of Soldering, Laboratory for Development and Research of Advanced Metallic Materials and Composites). During the last few years, many modern devices were obtained as part of investment in the the “Centre for development” and the application of advanced diagnostic methods in processing of metallic and non-metallic materials. The Institute has acquired a high-resolution scanning electron microscope; JEDL 7600F equipped with EDS, WDS and EBSD detectors, a confocal laser scanning microscope; ZEISS LSM 700, a universal testing machine for evaluation of mechanical properties of materials; LabTest -2.250SF1-HM, a Charpy impact tester; CHITEC UVS, a UV-visible spectrometer; NETZSCH 409 CD, a high-temperature dilatometer; NETZSCH CHK300 J-I, a simultaneous thermal analyser; NETZSCH LabTest 4.250SP1-WM, a Charpy impact tester; WDS and EBSD detectors, a confocal laser scanning microscope; ZEISS LSM 700, a universal testing machine for evaluation of mechanical properties of materials; LabTest -2.250SF1-HM, a Charpy impact tester; CHITEC UVS, a UV-visible spectrometer; NETZSCH 409 CD, a high-temperature dilatometer; NETZSCH 402 C, a laser flash analyser; NETZSCH LFA 427, a temperature stimulated depolarisation; CONCEPT 90 with Quatro Cryosystem, a spectral analyser; Solartron 1260, a rotation viscometer; Gemini II and volumetric measurement equipment; D-MDR 3000. New software was also obtained related to modeling properties of materials subjected to mechanical and thermal treatment which has greatly enhanced the computational facilities of optimising the processing parameters (Sysweld, DEFORM, JmatPro).

In the areas of research and education the Institute has established intensive cooperation with local and foreign institutes, including, Leibniz Institute of Solid State and Materials Research in Dresden (Germany), Institute of Energy and Environment (Austria), Research Center Dresden-Rossendorf (Germany), Institute of Physics of Materials, has long established traditions of co-operation with national and regional industrial partners, including Bekaert SA (Belgium), Böhler – Edelstahl, Branson div. Emerson, and Benteler (Germany).

**PROJECTS OF THE INSTITUTE**

**Project Title** Excellence Centre for functionalised multiphase materials (FUNMAT)  
**Coordinator** Prof. Ing. Jozef Janovec, DrSc.  
**Start Date** 04/28/2011  
**End Date** 31/12/2014  
**Programme** Other domestic  
**Annotation** The aim of the project is to gain new physics knowledge in the field of multiphase complex alloys, ceramics, composites and catalytically active surfaces of metals, plasmonic effects, photovoltaic and thermoelectric polymer structures, as well as from the field of biosciences.

The aim of the project is to gain new physics knowledge in the field of multiphase complex alloys, ceramics, composites and catalytically active surfaces of metals, plasmonic effects, photovoltaic and thermoelectric polymer structures, as well as from the field of biosciences.
Project Title | Characterisation of special glasses via physical methods
---|---
Coordinator | Assoc.Prof. Ing. Marian Kubliha, PhD.
Start Date | 01/01/2012
End Date | 31/12/2013
Programme | APVV, SR Czech Rep.
Annotation | The project is focused on the support of long-time co-operation between the Slovak and Czech partners in the field of study into special glasses, particularly in the case of special glasses on the basis of chalcopyrites and oxides of heavy metals for optoelectronic applications requiring very low contents of impurities and defects (e.g. content of OH groups usually does not exceed 0.0001 mol%). To analyse glasses, highly sensitive measuring methods of selected physical quantities are used along with conventional ones. The project is aimed at mutual co-operation in the field of study and preparation of new developments in the field of study based on glasses cemented glasses and glasses filled with carbon nanotubes. The Slovak partner will focus on the support of long-time co-operation in the field of study into special glasses for advanced technical applications.

Project Title | Chemical sputtering: Computational modelling of properties and the creation of interactions in carbon-containing films when exposed to molecular ions and hydrogen cluster data for smaller model systems is essential in this project. Intermolecular interactions will be exploited in silico drug design, “docking and scoring” analysis and “silico” design, “docking and scoring” analysis and the description of the ligandactive site of the protein. The activity of “Aura” kinase inhibitors in tumor cells, molecules with angiostatic activity, blocking the vascular endothelial growth factor receptor2 will be investigated. Reference data for metal ligand interactions related to the SAMS formation and catalysis, interactions of molecules with surfaces, with a focus on increasing the understanding of the bonding mechanism. The Cett software will be used as a benchmark to verify DFT results. Wave function calculations may also be useful for the selection of a proper DFT functional.
---|---
Coordinator | Assoc.Prof. Ing. Martin Kusý, PhD.
Start Date | 01/09/2011
End Date | 31/12/2013
Programme | Other international
Annotation | The subject of the research is focused on advanced materials, processing and automation technologies for direct manufacturing and its application.
effect of structural, material and technological parameters of the current advanced coatings applied on the construction and tool materials in specific conditions of their application. The latest analytical techniques (HHRSEM, HRTEM, EBSD, RTG diffraction) will be used to examine the mechanism of forming wear-resistant types of PVD coatings on selected types of materials. The following evaluation of mechanical and tribological characteristics will be used to describe the influence of dynamic and static load of the layers on their operational reliability. The goal is to find a correlation between the internal construction of coatings, their interface phase structures, structural tension relations in the layers, ways of heat treatment prior to and post the PVD application and their tribological properties.

The basic knowledge of the crucial properties of alloys that can be used as environmentally friendly alternatives to solders. The work covered the areas of physical, metallurgical and mechanical properties. The top properties were to measure the melting point temperature and surface tension. The surface tension of molten solder is a basic parameter affecting wettability together with flux. The wettability of the solder alloy and mechanical properties of joints are influenced by the interface reaction and intermetallic growth between the solder and under bump metallisation. The objective was to establish a (micro)structureproperty relationship and potential reliability issue of PbSn solders.

The project focuses on the study of thermally activated development of binary and ternary phases in complex metal alloys based on aluminium and the aim of specifying related phase diagrams. Alloys of AIMTM type (T=transition metal) will be annealed at various temperatures and subsequently rapidly quenched in order to preserve the state corresponding to exposition temperature. Tm was substituted by Pd, Fe, Co, Cu, Mn or other transition elements. X-ray diffraction analysis, TEM, SEM, DTA, EDX, WDX and EBSD, as well as thermodynamic modelling used to analyse the phases. Attention was paid to the systems which have not been previously studied. Based on the experimental results and available theoretical knowledge, thermodynamic parameters of the identified phases and enhanced related thermodynamic databases were examined. The application of progressive experimental methods was prepared prerequisites for innovations in the methodology. The solutions contribute to the knowledge pool will the aim of possibly discovering new phases of original properties.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

<table>
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<tr>
<th>Employee</th>
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<tr>
<td>Ing. Jana Bohovcová</td>
<td>Estonia</td>
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<td>Mgr. Ondrej Bošák, PhD.</td>
<td>Czech Republic</td>
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<td>Assoc.Prof.Ing. Lubomír Čapilovič, PhD.</td>
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<td>Prof. Ing. Roman Čička, PhD.</td>
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<td>Assoc.Prof.Ing. Mária Domášková, PhD.</td>
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<td>Ing. Marián Drinovský, PhD.</td>
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<td>Mgr. Filip Holka, PhD.</td>
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<td>Assoc.Prof.Ing. Mária Hudáková, PhD.</td>
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<td>Prof.Ing. Jozef Janovec, Dr.Sc.</td>
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<td>Prof. Ing. Peter Jurčí, PhD.</td>
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<td>Ing. Karin Kocůrová</td>
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<td>Ing. Pavol Konopka</td>
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<td>Assoc.Prof.Ing. Marian Kubila, PhD.</td>
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<td>Ing. Natália Navrátilová</td>
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<td>Ing. Andrej Opálek</td>
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<td>Ing. Lubomír Orovec</td>
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<td>Prof. RNDr. Milan Ožvold, Csc.</td>
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<td>Ing. Matej Pašák</td>
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<td>Mgr. Magda Pětěrová</td>
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<td>Mgr. Michal Skarba, PhD.</td>
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<td>Prof. RNDr. Miroslav Urban, Dr.Sc.</td>
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<td>Prof. Ing. Viktorija Sedlická, PhD.</td>
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<tr>
<td>Ing. Paulín Zacková</td>
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MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Union of Slovak Mathematicians and Physicists
Mgr. Ondrej Bošák, PhD.
Slovak Physical Society
Slovak Chemical Society
Prof. RNDr. Miroslav Urban, Dr.Sc.
Slovak Academy of Sciences / Metal Science Society
Information Society of Education
Mgr. Jozef Krajčovic, PhD.
Special Interest Group of Chemistry and Physics of Solid
Assoc.Prof. Ing. Lubomír Čapilovič, PhD.
Slovak Astronomical Society
Mgr. Andrej Dobrońka, PhD.
Slovak Academy Society
Prof. RNDr. Miroslav Urban, Dr.Sc. Prof. Ing. Jozef Janovec, Dr.Sc. Learned Society at Slovak Academy of Sciences
Prof. RNDr. Miroslav Urban, Dr.Sc.
Slovak Commission for Scientific Degrees
Prof. Ing. Jozef Janovec, Dr.Sc.
MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

Minerals, Metals and Materials Society
Prof. Ing. Jozef Janovec, DrSc.

IUCr International Union of Crystallography
Assoc.Prof. Ing. Lubomír Caplovič, PhD.
Prof. Ing. Jozef Janovec, DrSc.

European Physical Society
Assoc.Prof. Ing. Róbert Riedmayer, PhD.
Assoc.Prof. Ing. Marián Kubliha, PhD.
Mgr. Ondrej Boška, PhD.
Ing. Roman Cíka, PhD.

Czech and Slovak Crystallographic Association
Assoc.Prof. Ing. Martin Kusý, PhD.
Assoc.Prof. Ing. Lubomír Caplovič, PhD.

Czech Society for New Materials and Technologies
Prof. Ing. Peter Jurči, PhD.

Regional Committee of the IUCr
Assoc.Prof. Ing. Lubomír Caplovič, PhD.

CVC Working Group Integral
Mgr. Andrej Dobrotna, PhD.

Association for the Heat Treatment of Metals
Prof. Ing. Peter Gráč, PhD.
Prof. Ing. Peter Jurči, PhD.

European Powder Metallurgy Association
Eng. Peter Gráč, PhD.

North-American Consortium on Non-Oxide Glasses (NACNOG)
Prof. RNDr. Ján Kaliúžny, PhD.
Assoc.Prof. Ing. Stanislav Minárik, PhD.
Assoc.Prof. Ing. Marián Kubliha, PhD.
Assoc.Prof. RNDr. Vladimír Labaš, PhD.

Norwegian Chemical Society
Mgr. Marián Palcut, PhD.

Union of Czech Mathematicians and Physicists
Mgr. Jozef Krajčovič, PhD.

International Society for Theoretical Chemical Physics
Prof. RNDr. Miroslav Urban, DrSc.

World Association of Theoretical and Computational Chemists
Prof. RNDr. Miroslav Urban, DrSc.

International Academy of Quantum Molecular Science
Prof. RNDr. Miroslav Urban, DrSc.

PUBLICATIONS (most important publications in 2012)


This part of Annual Report 2012 was verified by Prof. Ing. Jozef Janovec, DrSc.
EDUCATION AT THE INSTITUTE

STUDY PROGRAMMES OFFERED AT THE INSTITUTE

Bachelor’s level:
- Computer-Aided Production Technologies
- Production Technologies

Master’s level:
- Machining and Assembly
- Computer-Aided Design and Production
- Welding
- Industrial and Art Casting

Postgraduate level:
- Machine Technologies and Materials

Number of the students (as at 30/10/2011) registered on study programmes offered by the Institute: 642

Number of graduates (2010/2011) of the study programmes offered by the Institute: 228

INSTITUTE DEPARTMENTS

- Department of Welding
- Department of Machining and Assembly
- Department of Foundry
- Department of Forming

INSTITUTE OF PRODUCTION TECHNOLOGIES

CONTACT

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Slovak Republic
tel.: +421918646037
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STAFF

- Professors: 6
- Assoc. Professors: 12
- Senior Lecturers: 12
- Research Fellows: 10
- PhD Students: 61

ACTIVITIES OF THE INSTITUTE

27/02/2012 - Meeting with Bauer Gear Motor GmbH Company
22/03/2012 - Exposition of photographs by Prof. Marônek in “Trnava Objective 2012” Exhibition
03/04/2012 - Seminar ESAB
26-27/04/2012 - “Production and defects of tooth-wheels and gears” International Conference
05-08/09/2012 - Forming 2012 Conference
01/06/2012 - Presentation by the TRUMPF Company
12/06/2012 - Seminar on Forging
09-14/09/2012 - Presentation as part of the International Engineering Fair in Brno (Czech Republic)
07-09/11/2012 - Presentation as part of the exhibition “Week of Science and Technology in Slovakia 2012”
GRADUATE PROFILE

BACHELOR’S PROGRAMMES (Bc.)

Production Technologies
The graduate will understand the theoretical and practical issues in production technologies and systems. The graduate will be equipped with the skills to solve creatively the tasks in the field of production, seek new progressive technology procedures in the production of parts and technology units, using modern technology devices and information systems. After completion of the programme, the graduate will be well prepared either to continue with at Master’s degree level, or to enter the job market as a technologist or a team member in various areas of industry in both private and public sectors.

Computer-Aided Production Technologies
The graduate will be able to perform the role of a production technologist and able to operate computational technology CAX systems and Cax technologies used in the production preparation and control. The graduate will be able to prepare technical documentation and design and manufacturing stage of the production process, design programs for CNC machine tools, design complex 3D products and simulate preparation of their production. After completion of the programme, the graduate will also be able to implement and operate production and technological systems in a position of a CAD/CAM specialist, designer of tools and a programmer of CNC machine tools using appropriate computer systems and software.

MASTER’S PROGRAMMES (Ing.)

Machining and Assembly
The graduate will gain a complete Master’s degree education in the production of machine parts and implementation of the latest technologies, in particular the field of chip and chipless machining and products assembly. The graduate will fully understand the changes of material properties during the machining and principles of machine parts assembly. The graduate will have obtained a deep theoretical knowledge in the field of production technologies (machining, welding, forming, foundry and assembly), materials, tools, fixtures and machine tools supported by the knowledge of CAX technologies and systems. The graduate will be suitably prepared to work as a production specialist, tool designer, CNC and assembly specialist, as well as a leader in the sectors manufacturing process design.

Computer-Aided Design and Production
Graduates from the programme will be suitably trained to perform activities accompanied with the CAX technologies and systems application. After completion of the programme, the graduate will be able to lead teams utilising engineering computer analyses, simulations of production processes, computer technologies in the field of manufacturing process design, or work as managers and entrepreneurs in the field of computational technology and CA system implementation in production processes.

Industrial and Art Foundry
The graduate will have gained an indepth knowledge of the technological processes of liquid metal preparation, production of moulds for industrial and art castings with high-precision and high-quality surface. The graduate will be equipped with the theoretical knowledge of metallurgy of casting materials, processes, design of castings’ mould, moulds manufacturing, and apertures of castings. The graduate will be able to work with computational technology, software for simulation of casting processes, computer-aided design of the casting shape, and prediction of casting properties in the phase of production preparation. The graduate can autonomously design technological processes and control production in a foundry. The skills gained will enable the graduate to perform effectively in the public and private sectors, research roles, as well as in construction and project workplaces.

Welding
After completion of the programme, the graduate will be able to perform the role of a production technologist in the field of materials and their further progressive technologies of chipless and chip processing of materials, technology feasibility and modern progressive concepts of products that will be manufactured by welding, other joining technologies and cutting. The graduate will have simultaneously gained the knowledge of the computational technology utilisation and computer simulations in the field of thermal processes in order to minimise degradations of the chosen materials. The graduate will be able to justify safety risks and provide solid outcome for the economic assessment of a product. After completion of the programme, the graduate can successfully perform at a high level in industrial production, university research, both domestic and abroad, as well as in managerial positions requiring knowledge in the field of materials and their further progressive technological processing.

POSTGRADUATE PROGRAMMES (PhD.)

Machine Technologies and Materials
The graduate will have developed a wide range of theoretical knowledge in the field of metallurgy, progressive technologies of chipless and chip processing of materials, computer support and applications of CA technological systems, simulations and automation of technological processes. The graduate will have mastered the scientific methods of research and development in production processes, particularly in technologies of machining, welding, forming, foundry, machine metrology, assembly, powder metallurgy and CA technologies. After completing the programme the graduate will be able to autonomously articulate and solve research tasks, and to lead a research team. The graduate will be able to find employment in research and development institutes in managerial positions in the field of sophisticated production technologies, and in engineering universities.

LIST OF SUBJECTS OFFERED BY THE INSTITUTE

- Assembly Technology and CAX systems
- Assembly Theory
- Atelier of Computer-Aided Design and Manufacturing I, II, III
- Automation of Foundry Production
- Bachelor Project
- Bachelor Thesis
- Bulk Forming Processes
- CA systems and Computer Simulation Processes
- CAPP I, II
- CAX technologies
- Computer Aided Forming Technology
- Computer Aided Productions Technologies I, II, III
- Computer Aided Welding Technology
- Design and Manufacturing of Welding Constructions
- Design for Manufacturing
- Dissertation Project I, II, III, IV, V, VI
- Equipment for Foundry and Metal Casting
- Experimental Methods in Forming
- Experimental Methods in Machining
- Final Project
- Finishing Methods of Machining
- Forming Machines
- Forming Machines and Tools
- Forming Technology
- Forming Tools
- Foundry Technology
- Geometrical Product Specification
- Graduate Project
- Graduate Thesis
- Inspection in Welding
- Introduction to Computer Aided Production Technologies
- Machine Tools and Tools
- Machining Technology and Assembly
- Measuring and Control Parameters of Products
- Mechanization and Automation in Machining
- Metallurgical Processes in Casting
- Methods of Scientific Work
- Metrology
- Paedaeutical Activity I, II, III, IV, V, VI
- Planning of Welding Manufacture
- Pre-degree practice
- Professional Practice
- Production Systems II
- Programming of CNC Machines
- Progressive Machining Methods
- Progressive Methods of Assembly
- Progressive Methods of Moulds and Cores Production
- Projecting of Production Processes and Systems Design
- Quality Control and Casting Defects
- Quality Control of Weld Joints
- Quality Management Systems
- Research Work I, II, III
- Selected Parts from Theory and Technologies of Casting
- Selected Parts from Theory and Technologies of Forming
- Selected Parts from Theory and Technologies of Machining, Metrology and Assembly
- Selected Parts from Theory and Technology of Welding
- Semester Project
- Soldering and Brazing
- Special Casting Technologies
- Special Technologies of Artistic Castings Production
- Special Welding Methods
- Technical Preparation of Production in Machining and Forming
- Technical Preparation of Production in Welding and Casting
- Technological Design
- Technology of Cast Iron Production
- Technology of Powder Metallurgy
- Theory of Casting
- Theory of Forming
- Theory of Machining
- Theory of Welding
- Tribology
- Welding Machines and Equipment
- Welding Technology
Bachelor Theses

Ambruš, L.: Welding review of DP steels in the automobile industry
Antal, A.: Cast electrotechnical materials
Bartoš, M.: The influence of deformation on the reinforcement of cold formed steel-tube reducers
Beňák, R.: Design and construction of injection form by using CAD systems
Bestvina, R.: The application of electrophoretic coating during the adjustment of the mold for pressure injection molding
Bobok, R.: Creating animations of selected methods for measuring
Bolcsák, M.: Beam methods of material cutting
Búňčák, M.: Modelling of turning and drilling tools
Daučo, J.: Possibilities of computer support for nanotechnologies
Detry, M.: Potential uses of computer technology in the technological process of drawing
Dolanačko, M.: Binder of moulding compositions based resins
Drozd, J.: Laser technology in machining
Drobnič, J.: The draft of external profiling cutting insert with support of CAD software
Duríš, P.: Surfacing of metal powders by induction heating
Fejfar, Ľ.: Laser welding of magnesium and its alloys
Gajdoš, M.: Circular interolation in CAM and CNC machines
Gál, M.: Designing Injection Mold for Babyplast Molding Machine
Gráčik, M.: A proposal for increasing efficiency of component manufacturing
Gregus, R.: Computer Aided Finishing
Grüter, C.: Measuring the cutting forces in machining
Hendel, L.: Exploitation of CAD systems in CNC machining
Hireš, M.: Utilisation of advanced methods for modeling of milling tools
Hubička, J.: Production of a robotic telescope pointling device
Hučka, J.: Part production at multi spindle automatic machines
Kočička, J.: Hybrid technologies of weld bonded materials
Janek, P.: The effect of size reduction on the mechanical properties of drawn tubes
Janíková, K.: Comparison of methods for measuring straightness
Janíková, P.: Optimisation of control mechanism 1K in INA SKALICA spol. s.r.o. company
Jedlička, D.: Simulation of cutting materials in program ABB RobotStudio
Konečná, L.: CAPP systems in practice
Kováč, J.: The modelling of a moulding press for making glass component
Krčmářík, M.: Mathematical analysis of lead-free soldered joints
Leško, M.: Design for the manufacture of a wood band-saw with laser cutting technology
Lisinovic, T.: Adaptive control of the CNC machine in system Heldenhain
Lobodáš, M.: Laser beam welding with the use of a robot
Lubina, J.: Progressive methods of claddings to increase the quality of clad
Macek, E.: Nails production tools
Manca, Š.: Computer aided processes of bulk forming
Masaryková, R.: The current trends and methods to increase the life of forming dies
Mateoš, G.: Creation of postprocessor for the CNC machining centre
Nádasky, D.: A comparison of construction systems in the Magna Ltd. Company
Nádasky, M.: Welding of malleable cast iron with other metals
Očenáš, M.: 5-axis milling of thin-walled parts in the aerospace industry
Pavelka, L.: The use of laser beam cutting in practice
Pavelek, L.: Design of the soft solder for soldering with the support of power ultrasound
Pavlovič, E.: New trends in the field of cutting
Petrovič, M.: The current status of ceramic materials soldering
Pikáček, P.: Design of the chain conveyor with a versatile device for two types of parts
Polák, A.: Design considerations of castings
Ponca, M.: Theoretical analysis of the possibilities to increase the life of forming tools
Remesi, M.: The application of CA Technologies in the design and manufacturing of reducer flange
Rovný, O.: The application of unconventional materials, elements and principles in machine tool construction
Šatin, L.: Design of an injection tool for automobile parts
Semjan, P.: A study of the high-speed forming process
Schay, M.: A proposal of production technology for aluminium parts
Stano, T.: A proposal of the manufacture for plastic moulding
Straka, J.: Welding process of tracks
Strueh, F.: 3D digitalising and rapid prototyping applica- tion for testing the development parts
Šihář, J.: The characteristics of surface modeling in CAD software
Šmídová, M.: Edit postprocessor in FeatureCAM software
Špányi, M.: Options for simulation of the wire drawing process
Štefan, M.: The use of TRITOP measurement of over-size of dies
Štibránová, P.: Testing of welded joints of new ultrasonic techniques
Švec, P.: Design of circle profile
Tomáška, J.: Analysis of fittings production in Slovakia
Tóth, M.: Rationalisation of an assembly station in Mülhauzer AG company
Tóth, R.: Properties of virtual reality in welding
Triznová, J.: Measurement of the polar coordinates
Uhrinec, L.: Alternative control systems for CNC machines
Urbanovič, L.: Technology analysis of severe plastic deformation
Uváček, M.: Design considerations in investment casting
Vachálek, J.: voxel application in the simulation software
Vařo, M.: Proposal of HI-Pot set-up assembling
Váňouček, M.: Rationalisation of membrane gas-meter assembly
Vetřlik, L.: Importance of development of flashless die forging
Vidích, V.: Practical problems of data acquisition during 3D digitisation
Vydra, P.: Potential uses of computer technology in the technological process of binding
Záhnaš, L.: Programming of CNC machines in engineering operations
Zajúec, R.: NC verification software
Žižinka, R.: Design and manufacturing of a pressing tool

Master's Theses

Babicz, D.: Milling composite materials
Bočko, T.: Utilisation of an ozonizer to increase the lifespan of cutting fluids
Bogár, D.: A study to establish electro-discharge machining at KON ŽIŽME MRP STU
Bogdányi, L.: Design and manufacturing of car body work using with the digitising, milling and laminating
Brtáň, R.: A proposal to rationalise the structure of the trailer hitch using the final elements method in GALIA SLOVAKIA Ltd
Bučko, M.: Comparison of methods for the evaluation of cylindricity variation using a coordinate measuring machine
Budrex, V.: The use fire devices assembly in Technicom, s.r.o. Komarno
Búňčák, V.: A study into the properties of duplex steels plasma weld joints
Cinkty, V.: Methods of fluxless soldering of aluminium and its alloys
Čapkovský, J.: The impact of the chemical composition on aesthetic characteristics and processing of sculptural bronze
Černý, M.: Design enhancements for the reinforcement of a map pocket
Čif, M.: Creation of parametric models in CATIA V5
Chudý, J.: The influence of atmosphere and vacuum on character of welded joints fabricated by explosion
Závorka, R.: Determination of a contact point position of a measuring arm
Kalný, M.: Renovation of painting lines for the car body
Kazík, P.: Welding process of tracks
Kršteník, J.: Proposal of welding technology for the repair of car bodies welding seams
Kazař, P.: Study of an robotic binder system based on sodium silicate
Klenko, M.: The influence of the production process of glass mould in GM Technology, Trenčín
Kočička, R.: Proposal of welding technology for the repair of spare parts for a printer
Kočička, R.: Design of the control process for the production of car chassis
Kubičiková, S.: Properties of selected silicon composite materials during the manufacturing process and under thermal stress in casting
Kubošek, M.: Proposal of a gazeous separators construction in the Wondernetwork company
Kuruc, M.: Improving the shape precision and the surface quality of welding areas
Lavrínčiková, D.: The influence of core sand on properties of the bentonite molding mixture for the rough-


PhD Theses
<table>
<thead>
<tr>
<th>PROJECTS OF THE INSTITUTE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project title</strong></td>
</tr>
<tr>
<td><strong>Coordinator</strong></td>
</tr>
<tr>
<td><strong>Start Date</strong></td>
</tr>
<tr>
<td><strong>End Date</strong></td>
</tr>
<tr>
<td><strong>Programme</strong></td>
</tr>
<tr>
<td><strong>Annotation</strong></td>
</tr>
</tbody>
</table>

| **Project title**         | Design, implementation and use of joint programs regarding quality in manufacturing engineering |
| **Coordinator**           | Ing. Ladislav Morovič, PhD. |
| **Start Date**            | 2012/2013 |
| **End Date**              | 2012/2013 |
| **Programme**             | Networking of university researchers |
| **Annotation**            | The aim of the project is to increase the level of students education and flexibility in the field of production engineering and production engineering quality in the central European region. The primary goal is to implement a common Masters and Doctoral study programmes and improve co-operation within the network. |

| **Project title**         | Investigation of dynamic characteristics of the cutting process in 5 axis milling in context of 5 axis machining at the Centre of Excellence. |
| **Coordinator**           | Assoc. Prof. Ing. Peter Pokorný, PhD. |
| **Start Date**            | 01/01/2011 |
| **End Date**              | 31/12/2013 |
| **Programme**             | VEGA |
| **Annotation**            | The project aims to explore the characteristics of the dynamic cutting process. In this context, the project studies the distribution and effect of cutting forces in the 5 axis milling. The chatter as well as its origin, effect and ultimately the conditions for its elimination are important dynamic characteristics as well. The project therefore addresses the causes of the chatter in 5 axis milling and deals with the solutions for milling without the chatter. The suitable choice of CAM milling strategies with regard to the desired shape and quality of a part is also an important parameter in the process of 5 axis milling. The project will therefore also analyse the impact of various 5 axis milling CAM-strategies on dynamic characteristics of the cutting process. |

| **Project title**         | Joining of surface treated thin steel sheets by modern joining methods |
| **Coordinator**           | Prof. Ing. Milan Marňáček, CSc. |
| **Start Date**            | 27/04/2011 |
| **End Date**              | 31/12/2013 |
| **Programme**             | VEGA |
| **Annotation**            | The scientific project deals with joining (welding and adhesive joining) of steel sheets with a different kind of surface treatment. The surface layer significantly influences arc stability of technological process and the subsequent quality of weld and adhesive joints. As the new joining technologies (laser beam welding, arc welding methods with controlled metal transfer, hybrid welding methods, MIG brazing and adhesive bonding) are gradually being applied in practice, there is the necessity to know the suitability of these joining methods to the defined surface treatment or to specify the range of process parameters leading to quality joint formation. |

<p>| <strong>Project title</strong>         | Technological heritability of laser micro-machining process and its influence on technological and exploitation properties of material. |
| <strong>Coordinator</strong>           | Prof. Ing. Peter Šugár, CSc. |
| <strong>Start Date</strong>            | 01/01/2011 |
| <strong>End Date</strong>              | 31/12/2014 |
| <strong>Programme</strong>             | VEGA |
| <strong>Annotation</strong>            | The goal of the project is to research optimal technological conditions of laser structuring in the processes of incremental forming tools and semifinished products surfaces modifications. |</p>
<table>
<thead>
<tr>
<th>Project title</th>
<th>Effect of the Saxis grinding parameters on the geometrical precision of shank cutting tools</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>Assoc. Prof. Ing. Štefan Václav, PhD.</td>
</tr>
<tr>
<td>Start Date</td>
<td>01/01/2012</td>
</tr>
<tr>
<td>End Date</td>
<td>31/12/2013</td>
</tr>
<tr>
<td>Programme</td>
<td>VEGA</td>
</tr>
<tr>
<td>Annotation</td>
<td>The project will deal with the grinding precision and geometry of shank cutting tools in depend-</td>
</tr>
<tr>
<td></td>
<td>ence of the cutting tool and using a newly designed methodology. The theory of cutting forces in</td>
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<td>grinding has not been processed properly. Researchers in this project will use a new method of</td>
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<td>experiment planning, where acquired relations will be dimensionally homogeneous and indica-</td>
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<td></td>
<td>tors of equations (dimension constants) will gain a physical sense. The project output will be</td>
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<td>dissemination of the theory of highly-parametrical grinding, a shift from 3axis to Saxis</td>
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<td>grinding. A unique contribution will be also the determination of life-cycle by means of specific</td>
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<td></td>
<td>cutting entropy. The goal will be the verification of the originally manufactured tools for Saxis</td>
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<tr>
<td></td>
<td>milling machines and their subsequent measurement of geometry prior to and post machining on</td>
</tr>
<tr>
<td></td>
<td>both the Zoller Saxis measuring machine and optical scanner.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project title</th>
<th>Implementation of an online classroom for the dynamic education of secondary technical school and university students focusing on design and manufacturing of freeform surfaces</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>Prof. Dr. Ing. Jozef Peterka</td>
</tr>
<tr>
<td>Start Date</td>
<td>01/01/2012</td>
</tr>
<tr>
<td>End Date</td>
<td>31/12/2013</td>
</tr>
<tr>
<td>Programme</td>
<td>VEGA</td>
</tr>
<tr>
<td>Annotation</td>
<td>The project aim is to develop an online classroom for the dynamic training of secondary school</td>
</tr>
<tr>
<td></td>
<td>and university students and the pilot implementation of the online classroom for training the</td>
</tr>
<tr>
<td></td>
<td>wider public in the field of CNC machines and CAD/CAM systems program-</td>
</tr>
<tr>
<td></td>
<td>ming as well as for accredited study programmes of Computer-Aided Production Technologies (Bc.)</td>
</tr>
<tr>
<td></td>
<td>and Computer-Aided Design and Production (Master) at STU MTF. The project will comprise the</td>
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<td>elaboration of complex materials (texts, presentations, multimedia videos, sample tasks) placed</td>
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<td></td>
<td>on the designed internet website available for all potential interested parties. Results will be</td>
</tr>
<tr>
<td></td>
<td>applicable to the whole Slovak Republic as well as abroad.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project title</th>
<th>Research into the metallurgical joining and other technological processes of processing the magnesium and other light alloys by progressive and suitable environment-friendly technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>Prof. Ing. MilanTurňa, PhD.</td>
</tr>
<tr>
<td>Start Date</td>
<td>01/01/2012</td>
</tr>
<tr>
<td>End Date</td>
<td>31/12/2013</td>
</tr>
<tr>
<td>Programme</td>
<td>VEGA</td>
</tr>
<tr>
<td>Annotation</td>
<td>The project will focus on the design, experimental verification and scientific justification of tech-</td>
</tr>
<tr>
<td></td>
<td>nological processing of Mg alloys. Selection of progressive and environment-friendly technologies</td>
</tr>
<tr>
<td></td>
<td>of metallurgical joining and forming. Welding and soldering brazing the Mg alloys with other metals</td>
</tr>
<tr>
<td></td>
<td>(Al, Ti, steels). Design and quality control of joints by using advanced non-de-</td>
</tr>
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<td>structive and destructive methods. A detailed study will be conducted of the interface of combined</td>
</tr>
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<td></td>
<td>joints with the AZ91 and AZ31 alloys, thus contributing to the research into the mechanisms and</td>
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<td></td>
<td>their origin and participation into the development of a new Mg alloy of ML3 type. The investi-</td>
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<td>gation of heat distribution by concentrated energy sources and comparison with AWJC. Verification for</td>
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<td>the possible use of microplasma polishing of surfaces of the Mg and Al alloys will be made. The</td>
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<td>study will focus on the strain/stress-deformation states of materials in processing the Mg and Al</td>
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<td>alloys (ISF, MS, Thixoforming) in order to optimise the parameters of forming processes and pre-</td>
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<td>dict utility properties of products. The justification of the economic and environmental priorities</td>
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<tr>
<td></td>
<td>of the individual technologies will also be given.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project title</th>
<th>Research into the effect of parameters of selected technological processes on the integrity of surface layers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>Assoc. Prof. Ing. Jozef Bilik, PhD.</td>
</tr>
<tr>
<td>Start Date</td>
<td>01/01/2012</td>
</tr>
<tr>
<td>End Date</td>
<td>31/12/2014</td>
</tr>
<tr>
<td>Programme</td>
<td>VEGA</td>
</tr>
<tr>
<td>Annotation</td>
<td>The project is aimed at examining the effect of selected technological parameters and techno-</td>
</tr>
<tr>
<td></td>
<td>logical impact on the properties and integrity of surface layers in order to predict the utility</td>
</tr>
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<td></td>
<td>and life-cycle of products. The goal is to determine the effect of speed and transformation size</td>
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<td>on the integrity of surface layers made by ramming, charging, spinning, rolling, shooting or cold-</td>
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<td></td>
<td>drawing of pipes and wires. To assess integrity, the re-</td>
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<td>search will use conventional methods of qualitative analysis as well as the results attained by</td>
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<td>the application of stereological materialography, Abbott-Fireston curves and evaluation of</td>
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<td>tribological properties. The attained results will be applied in the prediction of utility properties</td>
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<tr>
<td></td>
<td>of forgings and parts in practice.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project title</th>
<th>Research into the weldability of duplex and superduplex stainless steels by concentrated energy sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>Prof. Ing. Koloman Ulrich, PhD.</td>
</tr>
<tr>
<td>Start Date</td>
<td>01/01/2012</td>
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<tr>
<td>End Date</td>
<td>31/12/2013</td>
</tr>
<tr>
<td>Programme</td>
<td>VEGA</td>
</tr>
<tr>
<td>Annotation</td>
<td>The aim of the scientific project is the investigation and proposed solutions to problems regard-</td>
</tr>
<tr>
<td></td>
<td>ing the weldability of duplex steels with laser and electron beam. The welding of duplex steels</td>
</tr>
<tr>
<td></td>
<td>with arc processes has been solved and is currently used in practice. Welding with laser and</td>
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<td>electron beams, generally presents a problem with attaining a suitable proportion of the structural</td>
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<td></td>
<td>components austenite/ferrite (around 50/50 %) and results in poor corrosion resistance. The</td>
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<td>balance of phases ferrite-austenite is important primarily from the aspect of corro-</td>
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<td>sion, which is the main of priority of duplex steels.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Project title</th>
<th>Development of a leadfree solder for the application at higher temperatures and research of material solderability of metallic and ceramic materials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>Assoc. Prof. Ing. Roman Koletálek, PhD.</td>
</tr>
<tr>
<td>Start Date</td>
<td>01/01/2011</td>
</tr>
<tr>
<td>End Date</td>
<td>31/12/2013</td>
</tr>
<tr>
<td>Programme</td>
<td>VEGA</td>
</tr>
<tr>
<td>Annotation</td>
<td>The project is aimed at the development of a leadfree solder for the application at higher tem-</td>
</tr>
<tr>
<td></td>
<td>peratures. The developed solder is designed for environment-</td>
</tr>
<tr>
<td></td>
<td>tally friendly soldering of metallic and ceramic materials. The developed solder will be used for</td>
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<td></td>
<td>solderability tests of ceramic and metallic materials with the application of flux and without</td>
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<td>flux through the use of ultrasound power. The structural character of the solder under diverse</td>
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<td>soldering conditions will be studied, including the interactions on the soldered metal solder</td>
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<td>boundary. The qualitative solderability criteria of wettability, spreadability, capillarity, diffu-</td>
</tr>
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<td></td>
<td>sion and erosion at normal and extreme soldering condi-</td>
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<td>tions will be determined. The shear strength of joints</td>
</tr>
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<td></td>
<td>fabricated with the developed solder in metallic and ce-</td>
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<td>ramic materials will also be determined. The ageing tests</td>
</tr>
<tr>
<td></td>
<td>and thermal cycling tests of soldered joints will be also</td>
</tr>
<tr>
<td></td>
<td>performed.</td>
</tr>
</tbody>
</table>
VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

<table>
<thead>
<tr>
<th>Employee</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ing. Martin Bajčičák, PhD.</td>
<td>Austria</td>
</tr>
<tr>
<td>Prof. Ing. Ivan Baránek, CSc. Czech Republic, Germany</td>
<td>Ing. Joseph Bárt, PhD.</td>
</tr>
<tr>
<td>Ing. Claudia Bašovská</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Ing. Matúš Beňo PhD.</td>
<td>Croatia</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Matej Beznák, CSc.</td>
<td>Austria</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Jozef Bilk, PhD.</td>
<td>Hungary</td>
</tr>
<tr>
<td>Ing. Ivan Buránsky, PhD.</td>
<td>Germany</td>
</tr>
<tr>
<td>prof. Ing. Alexander Čaus, DrSc.</td>
<td>Russia</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Augustín Görög, PhD.</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Ing. Zdenko Guníš,</td>
<td>Portugal and the Azores</td>
</tr>
<tr>
<td>Ing. Marek Hurajt</td>
<td>Portugal and the Azores</td>
</tr>
<tr>
<td>Ing. Jozef Charbula</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Ing. Miroslav Jáňa</td>
<td>Austria</td>
</tr>
<tr>
<td>Ing. Jaroslav Jančár</td>
<td>Austria</td>
</tr>
<tr>
<td>Ing. Martin Kováč, PhD.</td>
<td>Croatia</td>
</tr>
<tr>
<td>Ing. Roman Kráľský</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Ing. Tomáš Kramář</td>
<td>Germany</td>
</tr>
<tr>
<td>Ing. Peter Krampočák</td>
<td>Turkey</td>
</tr>
<tr>
<td>Ing. Tomáš Kupec</td>
<td>Belarus</td>
</tr>
<tr>
<td>Ing. Marcel Kuruc</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Ing. Monika Maračková, PhD.</td>
<td>Ing. Jozef Ondruška</td>
</tr>
<tr>
<td>prof. Ing. Milan Maránek, CSc.</td>
<td>prof. Dr. Ing. Jozef Peterka</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Marcela Marčíková, PhD.</td>
<td>Assoc. Prof. Ing. Štefan Podhorský, CSc.</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Matej Beznák, CSc.</td>
<td>Assoc. Prof. Ing. Roman Koleňák, PhD.</td>
</tr>
<tr>
<td>Prof. Ing. Milan Maránek, CSc.</td>
<td>Assoc. Prof. Ing. Viktor Tittel, CSc.</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Pavol Kovačócy, PhD.</td>
<td>Assoc. Prof. Ing. Peter Pokorný, PhD.</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Roman Koleňák, PhD.</td>
<td>Assoc. Prof. Ing. Roman Koleňák, PhD.</td>
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<tr>
<td>prof. Ing. Milan Maránek, CSc.</td>
<td>Assoc. Prof. Ing. Roman Koleňák, PhD.</td>
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<tr>
<td>Assoc. Prof. Ing. Milan Maránek, CSc.</td>
<td>Assoc. Prof. Ing. Roman Koleňák, PhD.</td>
</tr>
<tr>
<td>Slovak Welding Society</td>
<td>Slovak Foundry Society</td>
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<tr>
<td>Slovak Foundry Society</td>
<td>Slovak Associations of Steel Constructions</td>
</tr>
<tr>
<td>Slovak Chamber of Commerce and Industry – Section of Production Machines and Equipment</td>
<td>Slovak Maintenance Society</td>
</tr>
<tr>
<td>Slovak Metal Science Society</td>
<td>Slovak Metrology Society</td>
</tr>
<tr>
<td>Technical Standard Committee</td>
<td>First Welding Company, Inc.</td>
</tr>
<tr>
<td>Slovak Institute of Technological Normalization – TK 76 Corrosion and Material Protection against Corrosion</td>
<td>American Welding Society</td>
</tr>
<tr>
<td>Czech Society for New Materials and Technologies</td>
<td>International Journal of Advances in Machining and Forming Operations</td>
</tr>
</tbody>
</table>

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

<table>
<thead>
<tr>
<th>Organisation</th>
<th>Members</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slovak Welding Society</td>
<td>Ing. Erika Hodúlová, PhD.</td>
</tr>
<tr>
<td>prof. Ing. Koloman Ulrich, PhD.</td>
<td>Ing. Ladislav Pavlovič</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Pavel Kovačócy, PhD.</td>
<td>Assoc. Prof. Ing. Roman Koleňák, PhD.</td>
</tr>
<tr>
<td>Assoc. Prof. Ing. Roman Koleňák, PhD.</td>
<td>prof. Ing. Vladimir Pušk</td>
</tr>
</tbody>
</table>


This part of Annual Report 2012 was verified by Prof. Ing. Milan Maroňek, PhD.
INSTITUTE OF PRODUCTION SYSTEMS
AND APPLIED MECHANICS

STAFF

• Professors: 1
• Assoc. Professors: 5
• Senior Lecturers: 12
• Research Fellows: 5
• PhD Students: 10

EDUCATION AT THE INSTITUTE

STUDY PROGRAMMES

• Production Devices and Systems

Number of students (at 30/10/2011) on study programmes offered by the institute: 222
Number of the graduates (2010/2011) from study programmes offered by the institute: 59

INSTITUTE DEPARTMENTS

• Department of Applied Mechanics
• Department of Technological Devices and Systems

CONTACT

Director
Prof. h.c. Prof. Ing. Karol Veľšek, CSc.
e-mail: karol.velisek@stuba.sk
tel.: +421918646053

Address
Rázusova 2, 917 24 Trnava,
Slovak Republic
tel.: +421918646035,
fax: +421/33/5511601

ACTIVITIES OF THE INSTITUTE

28-30/11/2012 - International Conference CECOL
2012 - Central European Conference on Logistics

GRADUATE PROFILE

BACHELOR’S PROGRAMMES (Bc.)

Production Devices and Systems
The graduate will gain a complete Bachelor's degree education in the field of manufacturing engineering focused on engineering production including the maintenance and means of mechanisation and automation. The graduate will understand machine technologies and applied tools. The individual will have acquired knowledge in the fundamentals of management, environmental engineering, work safety and health protection. The graduate will be able to solve the problems in the field of technical materials and their properties, as well as machine mechanics. After completion of the course the graduate will be prepared either for the Master's degree study programme in production devices and systems or for immediate entry to the job market. The graduate will find engagement as a designer of automated production systems and devices, as a technologist, self-employed in engineering services or as a specialist in various production sections.

MASTER’S PROGRAMMES (Ing.)

Production Devices and Systems
The graduate will gain a complete university (Master's degree) education in the field of manufacturing engineering and materials, production processes and production systems. The individual will understand the function of machines and constructions of production equipment. The graduate will have developed knowledge in the field of production machines and materials used in the processes of manufacturing and will be able to solve the tasks of machine mechanics, mechanisation and automation. After completing the programme the graduate will be able to recognise social, moral, legal and economic impacts of the profession and will be prepared to either continue studying at post-graduate level, implementing advanced methods and techniques of design and development, or to enter the job market immediately as an expert in production, project and development organisations in solving conceptual technical and organisational tasks of complex automation of production processes.
LIST OF SUBJECTS OFFERED BY THE INSTITUTE

- Applied Mechanics
- Assembly Machines
- Bachelor’s Project
- Bachelor’s Thesis
- Computer Aided Design I, II, III
- Cutting Tools
- Design of Production Systems
- Diploma Thesis
- Elasticity, Strength and Plasticity
- Experimental Methods and Technical Diagnostics
- Finite Element Method
- Fixtures
- Fundamentals of Engineering Design and Technical Documentation
- Graduation Project
- Hydraulic and Pneumatic Mechanisms
- Industrial Robots and Manipulators
- Industrial Robot Design
- Logistics of Production Systems
- Machine Parts and Mechanisms
- Machine Tools
- Machines for Special Technologies
- Maintenance of Production Systems
- Mechanics of Fluids and Thermomechanics
- Mechanics of Production Machines
- Mechanics of Rigid and Flexible Bodies
- Mechanisation and Automation
- Modelling of Thermal Processes
- - Noise and Vibration
- - Operation and Maintenance of Production Devices
- - Performance of Production Systems
- - Production Devices
- - Production Process Planning
- - Production Systems I
- - Professional Practice
- - Programming of Production and Manipulating Devices
- - Reliability and Safety of Technical Systems
- - Technological Equipment of Production Machines
- - Technological Process Modelling and Simulation
- - Theory of Automatic Machines

- Bachelor’s Theses
  - Birkul, D.: The current trends in developing permanent joints
  - Dobšíková, V.: The organisational structure of manufacturing production systems
  - Durkovič, M.: Implementation of angular and linear measurement units by using QuantumNX measuring station
  - Hlavanda, P.: Proposal for a handling device for the palletisation of the selected component
  - Hošek, M.: Modification of the control system of seat parts before delivery
  - Horváthová, P.: Design of a database of components for basic engineering and technical documentation
  - Chvaščák, M.: The use of the sensor system in the field of automation of assembly processes
  - Klíč, J.: Workspace layout of an IRB 120 industrial robot and its periphery
  - Kostolanský, M.: Renovation of machine components in practice
  - Krivý, M.: Design of an automated pneumatic system operated by PLC
  - Kupkovíčová, N.: Preventive, predictive and reliability oriented maintenance of production systems
  - Margenetín, M.: The influence of material flow design on the maintenance process
  - Matuš, L.: Operation, maintenance and servicing of technical equipment – lifting equipment
  - Michálik, J.: The ideological proposal of the press-surged gripping cap for selected parts
  - Miklo, M.: The application of technical standards for the drawing of surface roughness of machine parts
  - Palkovič, M.: A design of the production workplace
  - Petrošek, L.: Vibroisolation in engineering practice
  - Polčiová, M.: Parametric modeling by CAD systems
  - Pressel, M.: Markov’s process as a model of performance and efficiency of production systems
  - Prištic, M.: Parametric database rolling bearing
  - Půček, M.: The identification of tribological qualities of a sliding pair
  - Stajsko, P.: A proposal for the maintenance of mobile hydraulic systems
  - Šuklo, A.: The effect of chosen parameters on pneumatic control
  - Tolarovič, M.: Operation, maintenance and repairs of reserved technical devices – pressure vessels
  - Vavrží, P.: A summary of the current situation in the field of intelligent sensor systems
  - Master’s Theses
    - Babiax, M.: A draft of a suitable camera system for the identification of individual objects in the workspace for intelligent assembly cell UVM
    - Baraněk, J.: Proposal of automatic changes of an assembling device to disassembling
    - Baumgartner, M.: Design of the automatic equipment for the palletising workplace with use of the industrial robot IRB-120
    - Belai, R.: A design solution of a backup system for elevator suppling seats to the production line in PSA Peugeot Citroen, Tábor
    - Boris, M.: Algorithm of assembly processes in the flexible assembly system
    - Bučková, K.: Vibrodiagnostic evaluation of operating states of selected production systems nodes
    - Fitoš, P.: Design of the control program of industrial robot IRB 120 by means of software RobotStudio
    - Gašparovič, P.: Analysis of dynamic properties of rotor with flexible shaft of composite material
    - Hlavka, S.: Improvement of the technical reliability of conveyor turntable for car seats
    - Hrebitík, M.: Measuring the acoustic absorption properties of selected materials by PULSE system
    - Janota, J.: A proposal for the automation of the transfer of the railway carriages wheelset by assembly for surface treatment in ZOS Tmava, a.s.
    - LanGark, L.: A structural design of the sensor dynamic parameters based on piezoelectric materials
    - Melovíc, F.: Palletising workplace with component orientation by angular robot
    - Mišovič, P.: The design of production systems for the production of forgings die forging
    - Nádaský, D.: “Pick and Place” manipulator regulating program proposal for the assembly-disassembly cycle
    - Novák, S.: Recommendations for the maintenance of critical devices in fibre line – manipulation with pulp in Mondi SCPs s.r.o.Ružomberok
    - Pilář, M.: Analysis of the influence construction of turning tools on vibrations in the turning process
  - Popovic, I.: Design of production systems for manufacturing products
  - Rolník, L.: Structural design of clutch plates with a reduced thickness
  - Stančoková, K.: Material flow analysis of flexible assembly cell
  - Šafraňek, M.: Modernisation of a paper folding machine
  - Šimůnová, M.: Algorithm of working in the storage system in a flexible assembly system
  - Šoltésová, A.: Stochastic simulation of the production lines reliability (Monte Carlo method)
  - Švoj, J.: Creation of kinematic systems in the system CATIA V5
  - Topolský, L.: The study of the industrial robot IRB-120 management in the palletised workplace
  - Viliám, A.: A proposal of press machine control – the improvement of press operating personnel safety
  - Víttek, D.: Increase in the machine reliability for bodywork displacement in PSA
  - Vlček, P.: Design of the end-effector of an industrial robot IRB-120
  - Žák, K.: Increase in the hourly production capacity of five-door cars in the production procedure assembly of PSA Tír

PhD Theses

- Holubek, R.: Automatic exchange of grippers in intelligent assembly systems
- Kerak, P.: Intelligent clamping systems
- Oravcová, A.: Proposal and testing of the methodological process of jaw design by clamping devices for technological operations
- Španielka, J.: Prediction of steel products crack during heat treatment through the use of computer simulation
- Babalová E.: Experimental and numerical approaches to the investigation of laser cutting

RESEARCH AT THE INSTITUTE

- Areas of Research
  - Intelligent workpiece clamping
  - Intelligent assembly
  - Intelligent assembly systems
  - Thematic network on manufacturing technologies
  - New concept of integrated multifunction manufacturing system
  - Modelling, analysis, simulation and experimental investigation of machine aggregates as mechatronic systems
  - Investigation of new materials with progressive tribological properties
  - Research and application of new approaches in numerical methods – analysis and simulation of technological and industrial processes, static and dynamic analysis of engineering structures
  - Numerical simulation of heat transfer processes, fluid-structure interaction
  - Research and development in the field of theoretical and applied mechanics

Research characteristics

The research projects at the Institute of Production Systems and Applied Mechanics are focused on the support and development of education in the study programmes of Production Devices and Systems at Bachelor’s, Master and PhD. Degree levels. The research activities of the institute are aimed at obtaining solutions for up-to-date problems and tasks from the field of production systems and devices, applied mechanics, thermodynamics, heat transfer and numerical modelling of technological processes.

Main topics of research activities:

- Flexible manufacturing systems
- Intelligent assembly systems
- Intelligent clamping systems
- Special production systems
- Pneumatics and electro-pneumatics in control systems
- Material flow in production
- Use of computers in design and manufacturing of machines and devices
- Modeling, analyses and simulations of mechanical systems and machine aggregates
- Mechatronical principle application to production devices
- Methods of diagnostics and identification
- Mechanical systems reliability
- Vibrations, acoustics and biomechanics
In the framework of cooperation between research and practice, the Institute cooperates with several industrial enterprises and research centres (FESTO spol. s r.o. Bratislava; SMC Priemyselná automaťaizácia spol. s r.o. Bratislava; ZF Sachs Slovakia, a.s. Tnava; TONA IN-DUSTRIES spol. s r.o. Tnava; ZOS, a.s. Tnava; INA Škalica, spol. s r.o. Škalica; VUJE, a.s. Tnava; EBO Slovenské elekttráne, a.s. Jaslovske Bohunice; JAVYS, a.s., Jaslovske Bohunice; ALDeco, spol. s r.o. Jaslovske Bohunice) and with Institutes of the Slovak Academy of Sciences, metal design Slovakia a.s.

An important part of the research activities of the Institute is represented by cooperation with universities abroad. The most important partners are TU Vienna, TU Miskolc, TU Cluj-Napoca, TU Poznań, VUT Brno, TU Budapest, UTB Zlín, VSB Ostrava, TU Bratislava, TČU Plzeň, TU Izhevsk, and many others.

The results of research activities are published in domestic and international journals and presented at scientific conferences and symposiums. The obtained results are applied in education as well.

Areas of expertise:
- Acoustics and Vibration of Mechanical Systems
- Automation of Production and Assembly
- Numerical Analysis and Simulation of Technological Processes
- Industrial Heatings
- Structural Analysis (strength, dynamical) in the Area of Nuclear Energy
- Technical Analysis, Measurement of Thermophysical - Properties
- Production Technology
- Production Systems

PROJECTS OF THE INSTITUTE

| Project title | Analysis of qualitative parameters of a machined surface in the Saxis ultrasonic machining system |
| Coordinator | Ass. Prof. Ing. František Pečščok, PhD. |
| Date from | 01/01/2012 |
| Date to | 31/12/2014 |
| Programme | VEGA |
| Annotation | The project is a base research focused on the machining of selected hard-to-machine materials by milling. The emphasis is on monitoring the desired and achieved quality parameters of machined surfaces of hard-to-machine materials by the technology of milling and ultrasonic assisted milling. The solution is focused on the typical quality parameters of machined surfaces: surface roughness represented by the mean arithmetic deviation Ra, height of roughness Rz, dimensional precision of machined surfaces, type and size of residual stresses, the size of the components of cutting forces, technologi cal parameters of milling technology, type and shape of tool etc. When analysing the results obtained by machining, i.e. milling and ultrasonic assisted milling of selected hard-to-machine materials, findings will be compared were the values of quality parameters achieved under the same technological conditions. |

| Project title | Analysis of nonequilibrium thermal, metallurgical and stress strain processes in production technologies involving rapid cooling and solidification of metallic materials |
| Coordinator | Assoc. Prof. RNDr. Mária Behúlová, CSc. |
| Date from | 01.01.2011 |
| Date to | 31.12.2014 |
| Programme | VEGA |
| Annotation | Rapid cooling and solidification of materials in nonequilibrium conditions is used in several advanced technologies of production and the processing of metallic materials. The research in the framework of the submitted project will be focused on experimental investigations, numerical simulation and analysis of nonequilibrium thermal, metallurgical and stress strain processes in technologies of preparation of rapidly solidified powders using inert gas atomisation of melt, material forming in a semisolid state and also the laser welding and surface heat treatment. The main aim of the project is the identification of common characteristics, phenomena and nonequilibrium processes leading to the development of refined microstructures in the conditions of rapid cooling and solidification of materials. In the theoretical field, the project should contribute to the explanation of physical and metallurgical reasons of the formation of stable structures and in the high alloyed materials on the base of iron and aluminum. |

| Project title | Application of innovative layers and coatings for reconstruction of tribologically loaded surfaces |
| Coordinator | Ing. Eva Labašlová, PhD. |
| Date from | 01.01.2011 |
| Date to | 31.12.2013 |
| Programme | VEGA |
| Annotation | The operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems results in the operation of technical systems. The objective of the project is to analyse tribological layers types in terms of material and geometrical parameters. Using numerical analysis will examine the stress and strain levels in the TS element with innovative layers. The results of computational analysis, wear and life will be verified experimentally. |

| Project title | Intelligent assembly cell |
| Coordinator | prof. Ing. Karol Veššek, CSc. |
| Date from | 01/01/2009 |
| Date to | 31.12.2012 |
| Programme | VEGA |
| Annotation | The flexible and intelligent assembly cell conception includes new types of solutions to create structures of the assembly system. A none external industrial robot is used for the manipulation and also for assembly. Intelligent behaviour of the system will repose on the monitoring of important parameters of the system and also will monitor information about system interaction with its surroundings. Surround interaction information provide many advantages such as, the cell will bring flexible reactions of the system to the manufacturing changes, build up area saving, lower building costs and higher usage effects of the whole device. |

| Project title | Numerical, symbolic and experimental analysis of nonconservative mechanical systems |
| Coordinator | Ing. Tibor Nálnásí, CSc. |
| Date from | 01/01/2011 |
| Date to | 31.12.2013 |
| Programme | VEGA |
| Annotation | Undesired vibration and excessive noise |

| Project title | Research into the possibilities of “intelligence” implementation in the assembly process |
| Coordinator | Assoc. Prof. Ing. Peter Košťál, PhD. |
| Date from | 01/01/2012 |
| Date to | 31.12.2014 |
| Programme | VEGA |
| Annotation | The intelligent assembly paradigm includes a new approach to assembly system structure design. For the manipulation and assembly the industrial robot is used and equipped with the industrial vision system. Intelligent behaviours are based on the monitoring of important parameters of the system and its environment and the flexible reaction to changes. Realisation and utilisation of this design paradigm as an “intelligent assembly system” enables the flexible system to react to the production requirements as soon as environmental changes. Results of these flexible reactions are a smaller layout space through decreasing the production and investment costs and by increasing productivity. |

At the Institute, the following laboratories are currently in operation: The Laboratory of Robotics, the Virtual Laboratory of Pneumatics and Electro-pneumatics Systems, the Laboratory of Machine Mechanics, the Laboratory of Tribology, the Laboratory of Thermodynamics and Mechanics of Fluids, the Laboratory of Numerical Analyses, the Laboratory of Modelling, the Laboratory for Vibration and Acoustics Research and also the Mechanical Workshop.
Rapid manufacturing methods represent an ability to design components and produce parts on demand. The aim of the project is to create an interdisciplinary engineering team that would be able to solve complicated interdisciplinary problems, but there is a great possibility that Interdisciplinary Engineering Teams would make it better and faster.

We would like to involve teachers from partner Institutions in order to create team projects that would represent the main part of the programme. We would also like students to benefit from the programme, student exchange would be able to freely communicate and work - communicating with their supervisors e.g. during trainings, summer schools, excursions, etc.

In a period of 13-14 days the students will have the possibility to gain engineering knowledge during the lectures, exercises and interesting practical cases. Planned activities will concern the following topics: Science Communication, Surface Engineering, Roughness and Shape Measurements, Mechanical and Electrochemical Surface Treatments, Renewable Energy Resources, Agriculture and Forest Engineering, Corrosion Engineering, Civil Engineering, Economical Aspects in Engineering, Neural Networks, Artificial Intelligence, Experiment Planning, Statistical in Engineering, Biomaterials and Nanomaterials, Technical English for Engineers, Article Writing Secrets.

"Engineering as Communication Language in Europe" gives the opportunity to create successful cooperation not only between teachers but also students from the universities which are to participate in the network, as well as between beneficiaries of the fresmoremover mobility. Teacher and student mobility within this network enables learning and research experiences exchange within related fields and helps to build personal connections, broaden professional horizons and what is more, gives the opportunity to develop the curricula. Therefore, the knowledge exchanged between the partner Institutions will give a good possibility for the further development of the Universities as well as for increasing education standards. This network would also stimulate further topic-oriented engagement and provide the basis for such kind of work.

Project title: Development of mechanical engineering
Type of the project: CEEPUS
Number of the project: CIII-PL-0033-07-1112
Main investigator: Prof. Ing. Karol Veľíšek, CSc.
Time period of the project: 2011-2012
Annnotation: There are many native languages in Europe however, very often engineers use their own slang, which is quite well understandable to them, regardless of their nationality. I have noticed, that technical tutorials, brochures or other documents which are written in technical language can be understood by people, who have only basic knowledge of English.

The goal of the new CEEPUS Network “Engineering as Communication Language in Europe” is to create communication and cooperation between engineers dealing with various engineering branches, thanks to that, we would be able to create Interdisciplinary Engineering Teams. A strong background in engineer techniques applicable to a wide variety of complex problems is in demand along with engineers who understand more than one discipline and are prepared to work at the intersection of two or more engineering and science disciplines. Nowadays the research and industry sectors have high requirements towards engineers. Often a single engineer is not able to solve complicated interdisciplinary problems, but there is a great possibility that Interdisciplinary Engineering Teams would make it better and faster.

We would like to involve teachers from partner Institutions in order to create team projects that would represent the main part of the programme. We would also like students to benefit from the programme, student exchange would be able to freely communicate and work - communicating with their supervisors e.g. during trainings, summer schools, excursions, etc.

In a period of 13-14 days the students will have the possibility to gain engineering knowledge during the lectures, exercises and interesting practical cases. Planned activities will concern the following topics: Science Communication, Surface Engineering, Roughness and Shape Measurements, Mechanical and Electrochemical Surface Treatments, Renewable Energy Resources, Agriculture and Forest Engineering, Corrosion Engineering, Civil Engineering, Economical Aspects in Engineering, Neural Networks, Artificial Intelligence, Experiment Planning, Statistical in Engineering, Biomaterials and Nanomaterials, Technical English for Engineers, Article Writing Secrets.

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able mutual understanding of ever changing research sub-
jects. The research and educational work in the frame of the network will mostly be aimed to the following research /
Advocational topics:
- Processing of the medical images (from CT and MRI).
- Printing Rapid Prototyping (RP) master models for medical applications (planning fitting, training, educa-
tion).
- Designing and dynamically and statically analysing medical implants.
- Production of bio-compatible implants (casting and direct manufacturing).
- Developing new bio-compatible materials, suitable for RP technologies.
- Case studies of using the RP parts for medical purposes.
- Analysing the costs / benefits of using the RP for medical applications.

Project title: Teaching and Research of Environment-oriented Technologies in Manufacturing
Type of the project: CEEPUS
Number of the project: CIII-RO-0013-07-1112
Main investigator: Prof. Ing. Karol Veľšek, CSc.
Time period of the project: 2011 – 2012
 Annotation: The project will focus the development of skills to prepare those individuals participating in stu-
dent mobility, short-term mobility and teacher mobility with the necessary skills.

Student mobility - professional achievements - language knowledge - previous or current concerns regarding the aspects of environmental protection and modern technologies in this field.

The universities have to know how to respond to global problems. The goal of the project is to develop machines and equipments with large dimensions. The main action lines of the e-learning systems in study area of production engineering are based on:

- Information and Communication Technologies (ICT): Digital literacy as e-books, e-papers, e-courses, etc.
- The teaching process must be based on e-presentations (slide-shows, paper show system, etc.).
- Development of virtual laboratories especially in case of equipments with large dimensions.
- Development of simulations for improves the functions parameters.
- Using the virtual tests for find the possible errors in the design of machines and equipments.
- Implementation of virtual laboratories specific for each universities responsible for implementation of virtual laboratory network between Universities.
- Implementation of modern communication technolo-
gies, especially for the case of lifelong learning, between the students and teaching staff of universities.
- Simulations of industrial logistics activities.

All activities concerning the “e” (electronic) are keys for solving of global problems of producers and global problem of universities. It is necessary to solve the legislative frame of common interest and accord the national legis-

lative frame with the European legislative frame.

Joint programs give a good platform for an increase of col-
laborated universities and using of e-learning systems can increase the efficiency. Therefore the subject of new CEE-

PUS III network is titled “Implementation and utilization of e-learning systems for Europe’s move to a knowledge-based so-
ciety”.

The main principle is the elaboration and implementation of joint programs in the study area of production engi-

neering in the Central European region.”

The global world brings global problems for industrial production. Economic pressure urges producers to make more customised products of high quality, in smaller se-

ries, with shorter lead time and of course, without in-
creased costs. Time is becoming one of the most im-
portant point of the companies strategy. Costs are also important, however more important is competitive price and the most significant and marketability of manufac-
tured products. Therefore producers look for different ways (new design, modern tools, etc.) to increase the competitive advantage of their products.

In most cases, leading competitors bought all prospec-
tive companies (their potential competitors), so they continued to produce, but, after this, different products. If small and medium sized manufacturers want to re-
main in a globalised market, they intensively and ines-
santly must develop their products, apply new technologies and nourish aggressive marketing, because it is the only way in this market.

When some product is being analysed, we can discuss its aesthetic characteristics (shape, colour, style), its
technical characteristics (dimensions, mass), its service characteristics (capacity, energy consumption), functional characteristics (principle of functioning), and design (construction and performance way). However, when the product occurs on the market, its market characteristics become very important. It is necessary that manufacturers always have to develop market characteristics of their products in order to encourage potential customers to choose their products. The final selection of the products and producers by consumers is dependent on the market characteristics of the product, ability of marketers and retailers or buyers and sellers to point out those characteristics and use them in forming the prices and other sales aid activities (delayed payments, credit, exchange etc.).

The market characteristics are the following: nature and complexity of the product, specific characteristics, variety of the palette of products, quality, design, price, product brand, image of the product, packaging, production date, distinctiveness and protection of the product, sales brochures and catalogues, marketing support, availability of the product, customer service, timing of product delivery, warranty terms, technical support, service support, etc.

The majority of market characteristics are influenced by the producers themselves, and they have the biggest responsibility for the sales of their own products. However, the role of the retailers is also important, which leads to the conclusion that the sales problem should be tackled with a complex approach, with the full cooperation of all involved parties. This is especially relevant today, when the increase of the sales of domestic products is a priority and all the relevant information regarding the quality of the products should be disclosed.

Also, it is very important to secure availability of the domestic products supply, keep the public informed of where those products are sold, ensure that they are recognizable in retail outlets, labelled separately that they are produced domestically, outline the reasons why consumers should choose them over competition, train the sales staff in details about the advantages of the domestic products and encourage them to present that to the consumers. All of these factors can have a significant influence on the consumers, and in addition to affordable price, credit financing, attractive design and good image, they can play a determining role in decision-making regarding the purchase of domestic products by the consumers. It is also important to accentuate high impact of the image of the product, which is dependent on the image of the producer, image of the current customer base, product design image, packaging image, image of the visual graphics displayed on the product and packaging, image and perception of pricing, image of retail outlets, image of the promotional activities, image of the after sales support services etc. Technical characteristics depend on the nature of the product so that with sports equipment importance is in design, comfort, recognition and price; with household appliances importance is in design, ease of handling, low weight, easy maintenance, low noise and price; with transport vehicles, design, comfort, fuel usage, low emissions and environmental issues; with working machinery, capacity, precision, and the degree of automation; with generators and energy converters, power, and effective utilisation which show the degree of perfection of converting the energy. Technical characteristics can

**VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS**

<table>
<thead>
<tr>
<th>Employee</th>
<th>Country</th>
<th>Country</th>
</tr>
</thead>
</table>
| Assoc.Prof.RNDr. Mária Behúlová, CSc. | Czech Republic | Croatia
| Ing. Lenka Čičmancová | Estonia | Estonia
| Ing. Nadežda Hankeová | Estonia | Estonia
| Ing. Radovan Holubeš, PhD. | Czech Republic | Czech Republic
| Assoc.Prof. Ing. Peter Koštál, PhD. | Czech Republic | Czech Republic
| Ing. Katarína Krašová | Czech Republic | Czech Republic
| Assoc.Prof. Ing. Milan Nadáši, CSc. | Estonia | Estonia
| Ing. Tibor Nánási, CSc. | Czech Republic | Czech Republic
| Assoc.Prof. Ing. František Pecháček, CSc. | Romania | Romania
| Ing. Roman Ružarovsky, PhD. | Croatia | Croatia
| Ing. Roman Ružarovsky, PhD. | Croatia | Croatia
| Ing. Silvia Sebeleová | Czech Republic | Czech Republic
| Prof. Ing. Karol Vešlěk, CSc. | USA | USA

**MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS**

- **Slovak Acoustical Society**
  - Ing. Tibor Nánási, PhD.
  - Assoc.Prof. Ing. Milan Nadá, PhD.
- **European Acoustical Association**
  - Assoc.Prof. Ing. Milan Nadá, PhD.
- **Slovak Welding Society**
  - Ing. Helena Kraváriková, PhD.
  - Ing. Jámlita Oračová, PhD.
- **Technical Commission 21 SÚTN Bratislava**
  - Ing. Tibor Nánási, PhD.
  - Assoc.Prof. Ing. Milan Nadá, PhD.
- **Slovak Associations of Mechanical Engineers (SASI)**
  - prof. Ing. Karol Vešlěk, CSc.
  - Assoc.Prof. Ing. Peter Koštál, PhD.
  - Assoc.Prof. Ing. František Pecháček, PhD.
  - Ing. Radovan Holubeš, PhD.
  - Ing. Roman Ružarovsky, PhD.

**Technical Commission 68 SÚTN Bratislava**
- Assoc.Prof. Ing. Milan Nadá, PhD.

**Expert Group for Chemistry and Physics of Solids**
- Assoc.Prof. RNDr. Mária Behúlová, CSc.

**Technical Commission 81 SÚTN Bratislava**
- Assoc.Prof. Ing. Bohumil Taraba, PhD.

**Technical Commission 57 SÚTN Bratislava**
- Assoc.Prof. Ing. Bohumil Taraba, PhD.
MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

Society of Machining and Machine Tools
Prof. Ing. Karol Veľšek, CSc.
Assoc.Prof. Ing. Peter Košťál, PhD.
Assoc.Prof. Ing. František Pečaček, PhD.
Ing. Marcela Charbulová, PhD.

OIAV - ÖSTERREICHISCHER INGENIEUR - UND ARCHITEKTEN- VEREIN
Prof. Ing. Karol Veľšek, CSc.

WASET - World Academy of Science, Engineering and Technology - Scientific Committee and Editorial Review Board
Prof. Ing. Karol Veľšek, CSc.
Assoc.Prof. Ing. Peter Košťál, PhD.
Ing. Nina Danišová, PhD.

Ing. Roman Ružarovský, PhD.

PUBLICATIONS (most important publications in 2012)


Danišová, Nina - Ružarovský, Roman - Veľšek, Karol: Application of sequence diagram within transport device sensorial system design. - In: World Academy of Science, Engineering and Technology. - ISSN 2010-376X. - Iss. 65, Part X: May 2012, Tokyo, Japan (2012), s. 1328-1333

Danišová, Nina - Ružarovský, Roman - Veľšek, Karol: Design methodology for sensory and actuating equipment in intelligent assembly cell. - In: World Academy of Science, Engineering and Technology. - ISSN 2010-376X. - Iss. 65, Part X: May 2012, Tokyo, Japan (2012), s. 1322-1327


The Czechoslovak Association for Crystal Growth Assoc.Prof. RNDr. Mária Behúlová, PhD.

European Acoustical Association Ing. Tibor Nánasi, PhD.

IACSIT - International Association of Computer Science and Information Technology Assoc.Prof. Ing. Peter Košťál, PhD.

IIIS The International Institute of Informatics and Systems Ing. Nina Danišová, PhD.

SCIEI - Science and Engineering Institute Assoc.Prof. RNDr. Mária Behúlová, PhD.

This part of Annual Report 2012 was verified by Prof. Ing. Karol Veľšek, PhD.
CONTACT

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Slovak Republic
tel.: +421918646021

INSTITUTE  
OF APPLIED INFORMATICS,  
AUTOMATION  
AND MATHEMATICS

STAFF

• Professors: 6
• Assoc. Professors: 9
• Senior Lecturers: 16
• Research Fellows: 6
• PhD Students: 41

EDUCATION AT THE INSTITUTE

STUDY PROGRAMMES

• Applied Informatics and Automation in Industry
• Process Automation and ICT Implementation in Industry
• Process Automation and ICT Implementation

Number of students (at 30/10/2012) registered on study programmes offered by the Institute: 552
Number of the graduates (2011/2012) of the study programmes offered by the institute: 207

ACTIVITIES OF THE INSTITUTE

27/02/2012 - Meeting with Bauer Gear Motor GmbH.
04/07/2012 - A decree awarding the title of Visiting Professor is given to Oliver Moravčík by the Universidad Central Marta Abreu de las Villas/Cuba.
09-14/09/2012 - The Institute gives a presentation at the International Engineering Fair in Brno (Czech Republic)
31/10/2012 - A lecture is given on the topic of “Advanced Software Testing I.” delivered by Ing. Roman Nagy, PhD., a development expert for software architecture and development. Since 2008, he has worked for the Research and Development Division of BMW AG (Munich, Germany).

GRADUATE PROFILE

BACHELOR’S PROGRAMME (Bc.)

Applied Informatics and Automation in Industry

The graduate will obtain the first level university education in the interdisciplinary field of study in Automation and Applied Informatics. The interdisciplinary study allows the application of skills in industry and also in the service sphere. Throughout the programme the individual will have gained an understanding of the information systems of an industrial enterprise and control systems of technological and production processes. The graduate will have developed an understanding of the processes and the methods of implementation and operating of information technologies and automation. Graduates from this field will have a fundamental knowledge of automation and informatics and will be able to implement the process through the use of computer-aided systems. The graduate will have knowledge and skills in the field of machine technology, automation and ICT implementation in the processes as well as the fundamentals of diagnosing, collecting, processing and transformation data, along with experience in programming, computer modeling and simulation. The practical operation of automatic measuring, control and information systems will contribute to the graduate’s ability to solve problems regarding the implementation and utilization of computational and automation technology and the individual will have gained knowledge of natural science within the first degree of university study, mathematical and physical basics of automation and computer science. The in-
individual will have developed the necessary IT skills, will be able to work alone or as a member of a team and will have skills to analyse automation and information technology requirements as well as implement and operate automation, equipment and information technologies in control systems. Completion of the programme will equip the graduate with an awareness of social, moral, legal and economic contexts of the profession and the personalities of automation and information technology application. Moreover the graduate will be ready to perform in the field of industry and services as well as to study the second degree in automation and apply its knowledge. The graduate will be able secure employment and work successfully in jobs connected with the implementation, operation and maintenance of control and information systems for technological processes, control and data processing in various fields of industry.

MASTER’S PROGRAMME (Ing.)

Process Automation and ICT Implementation in Industry
After completion of the course the graduate will have acquired extensive knowledge of theoretical and applied scientific disciplines necessary to understand patterns during the practical, technological, informational, automation and control processes in industrial companies and organisations, even at the description level of abstract models. The graduate will master basic technological processes in industries, production and the structure of manufacturing. This knowledge will allow the individual to design systems and ways of automated control and information support, with design consideration given with regard to environmental and ecological aspects.

POSTGRADUATE PROGRAMME (Ph.D.)

Process Automation and ICT Implementation
The graduate will have developed expertise in the modern fields of automation and control processes utilising information technologies in the development of new methods, algorithms and procedures on the level of a scientist and a researcher. Depending on the choice of elective subjects, students can specialise in the areas of complex systems by utilising information technologies, in the field of modern flexible manufacturing systems or intelligent management techniques with artificial intelligence. The individual will master mathematical principles, theory and cybernetics methodology combined with advanced methods, theories of management and automation. Upon completion of the programme, the graduate will have developed knowledge of the principles and methods for designing the complex systems and complex systems of information technologies. The graduate will be able to analyse and define the problems of scientific research, implement projects by using the latest formal tools and experimental procedures in accordance with the EU legislation. The graduate will understand the background of automation, control and related sciences as well as the physical fundamentals of the originally implemented solutions for automated and automatic control, information technology, preparation and management of experiments, modelling and simulation. The graduate will be aware of the social, moral, legal and economic aspects of the profession as a scientist or a researcher. The graduate will be well prepared for an immediate entry into the labour market as well as for postgraduate study in order to further develop their scientific potential in information technologies and automation. The graduate will be able to successfully perform not only in the design and operation of information and control systems in industrial plants, but also in the design or consultancy offices for institutional automation, management and telecommunication systems, software engineering, as well as in schools in educational institutions.

LIST OF SUBJECTS OFFERED BY THE INSTITUTE
- Applied Mathematics
- Automation of Data Acquisition and Processing
- Bachelor’s Thesis
- Bachelor’s Project
- Diploma Thesis
- Graduation Project
- Dissertation Project I,II,III,IV,VI
- Graphical Systems
- Information Systems
- Real-Time Information Systems
- Information Technologies
- Complex System of Production Control Systems
- Intelligent Control Methods
- Internet Technologies
- Information Systems – Deployment and Integration
- Communication Technologies
- Mathematical Methods of Experiment Planning and Evaluation
- Mathematics I, II, III
- Systems Modelling and Simulation
- Neural Networks and Genetic Algorithms
- Object Oriented Programming
- Professional practice
- Pedagogic activities I,II,III,IV,VI
- Computer Integrated Manufacturing
- Computer Graphics and Digital Image Processing
- Computer Architecture and Operating Systems
- Computer Networks
- Process Visualisation
- Programming Languages
- Programming of Industrial Controllers
- Programmable Logic Controllers
- Planning of Control Systems
- Knowledge Representation and Inference Mechanism
- Control of Flexible Manufacturing Systems
- Project Management
- Production Systems Control
- Simulation Optimisation in Production Systems Control
- Software Engineering
- Decision Support Systems
- Automatic Control Hardware
- Automatic Control Theory
- Systems Theory
- Complex System Theory
- Selected Topics in Mathematics
- Research paper I,II,III,IV,VI,VII
- Development of Information Systems
- Basics of Automated Control

GRADUATE THESIS

Bachelor’s Theses
Baláž, M.: Project and implementation of information system for small business
Bartoš, M.: Information systems of a construction company using UML
Belan, R.: The use of technical equipment to increase the safety of a facility (camera systems)
Benka, T.: Mensuration characteristics of transistor amplifiers using the selected measurement and control unit
Berčík, P.: Multimedia products guide in the company, Zatezárna Podbrezová
Cuninka, P.: Generating simulation models of radnom structure applied in Matlab
Čípel, M.: The development of iOS applications for iPhone Devices
Demeš, M.: Information system at a real estate store using UML
Demian, A.: Solved and unsolved examples in C++
Durevčal, K.: The design and model of a facility using the environment Control Web for station Simatic S7-300
Fazekas, M.: Controlling a tramway by PLC
Frankl, J.: The design and realisation of a model for radio frequency management and depending control program for station Simatic S7-300
Fraňo, D.: Configuration of a Linux-based domain controller for mixed clients
Fuňák, M.: The design and implementation of information system educational institutions in UML notation
Grolmus, M.: The proposal of a Information System agenda for a dental clinic
Hetteš, P.: Comparison of ABB and Fanuc robots
Hnilica, P.: A design for the operation of a printing machine using PLC and a stepper motor
Hrabala, M.: Software modules for combustion burners
Chobot, P.: The design and implementation of web applications for small business
Chovanec, M.: The design and implementation of an interactive ordering system in UML notation
Janák, J.: The possibilities of controlled graphics applications creating Windows
Kiliany, P.: Mobile application IS for price calculation using OS Android
Klačanský, M.: The design and implementation of a safe computer network for a small company
Košarišťan, J.: Implementation of application for Android mobile devices for a private company
Kováčová, M.: The design and implementation of the information system of a corporate agenda in UML notation
Krajc, D.: Plugin for XEP-0136 support to Pidgin IM
Lendel, J.: Database applications for the need of community self-government
Lengsfeld, M.: The use of instance data blocks, functions and indirect addressing in step 7
Lespiš, P.: Web design applications using the MVC architecture
Lózová, K.: WEB database application for a military paintball association
Majko, P.: The design and realisation of the controlling program for a stacker-rack
Márfföldi, P.: Creating a website for TAS Trnava
Matovič, M.: The design of a security system in an intelligent house
Mavryni, A.H.K.: A proposal for dynamic web applications
Miklošović, T.: The design and implementation of a local information system - module client account management
Mikulášek, M.: Compressed graphics file formats for pictures
Moglišky, D.: Creating a robot control program for the HSC
Mráz, P.: The creation of a hybrid system model and event processing algorithm in MATLAB (Simulink)
Musil, V.: Configuration with AI/AO for support teach-
ing of the programmable logic controllers
Nagy, M.: Modern segmentation techniques in the field of image processing
Ondria, T.: Controlling of step motor with the aid of an assembler
Palkovič, J.: The realisation and provision of a home ad-hoc WiFi network
Petrušek, I.: The realisation of the information system of operations with the technical orientation using UML
Potkány, G.: Design and implementation of an online dictionary interface
Repka, M.: Graphic formats of video
Rolince, M.: GrabCut Segmentation Technique
Schir, J.: Proposal of a small information system using UML module for a pawn shop
Slovak, R.: Implementation of the automation solution for the warehouse of a gastronomic facility
Šebeň, T.: Designing and editing a student’s journal
Škorec, L.: The creation of an interface and software to control a stepper motor
Šperka, A.: System automation of a house
Šuchaň, J.: Controlling of a virtual model by Simatic S7-300
Šusta, M.: Tool for data import to the DBMS MySQL for different types of coding (the WEB application)
Tadanaí, O.: The use of Visual Studio Tools for Office in statistics analysis
Tanko, M.: Realisation and design of implementation of secure computer network for small business
Turanc, A.: A module for work with genetic algorithms in Matlab
Ujčič, M.: Implementation of information system for the purchase of secondary raw materials
Urban, R.: Design and development of small IS using CMS Joomla
Varga, R.: Suggestion and realisation of a control system for a model of a vehicle
Zarnócai, D.: Design and implementation of a web site for hotel Phoenix using CMS

Master’s Theses
Andris, F.: Design of the Information System for company, Electroprav
Babíravová, D.: Determination of the optimal production time of the selected product using simulation optimisation
Bánovský, P.: The determination of optimal production size with the usage of simulating optimisation
Bekéniová, J.: Determination and optimisation of the production of selected steels
Blaško, B.: Design and realisation of IS for a logistics company with the use of BPMN and UML
Bolík, M.: Supporting software for planning of production quality
Břázdovič, M.: The design of measurement and regulator circuits for heat waste
Briestenský, M.: The design and implementation of measurement and heat control in a multifunctional building
Bužár, D.: The design and implementation of an air-conditioning control unit with the station Simatic S7-300
Bucháčik, A.: The information system of repairs on LCD assembly lines
Bula, M.: The design of a system for measuring the temperature curve of the building
Čačík, P.: Improving the efficiency of production of LCD and its production using the TouchStar production and simulation
Čelko, A.: Positioning of the samples using a laser scanner
Čuvala, P.: MS SharePoint Server 2010 employee portal
Daniš, L.: The design and realisation of an information system using UML and UP – module for client insurance
Daniš, M.: The proposal and implementation of small IS using BPMN and UML – guesthouse modulus
Dobšovič, M.: The communication of microprocessors on the 8051 microcontroller
Domín, M.: Design and implementation of IS for a paintball centre
Drinka, L.: The software application for solving of linear differential equations with special right-hand side
Dušri, R.: Performance analysis of SMT production lines by simulation
Farák, J.: The maximisation of using production machines by simulation optimisation
Furko, M.: Design improvements in manufacturing cabinets using simulation
Garaj, T.: Simulation of manufacturing components for the company, IKEA
Gaspar, G.: Distributed systems of temperature data collection
Grablička, M.: A comparison of numerical methods for ordinary differential equations of the second order with initial conditions
Grman, P.: Simulation of the logistic processes in the electronic industry
Holčík, P.: A virtual model of a production line for the production of concrete pressings
Holenčín, L.: Design of an information system for a pharmacy
Horáčik, P.: An integrated security system for an office building
Horka, M.: The issue of computer networks security using IP protocol filtering
Horváth, A.: Improvement of the quality of digitised technical drawings
Horváth, P.: The implementation of a depot system into the CMS Joomla!
Hranoš, M.: Design and realisation of store IS with BPMN and UML
Hrása, P.: The proposal and realisation of warehousing and commercial IS for a company with the use of BPMN and IP
Hříval, J.: Tester of rotary incremental encoders
Hyšoš, M.: A draft of the communication interface with a smart house
Chobot, D.: Simulation of front car seat manufacturing (Manbekavá, A.): The creation of themes in the www-environment
Jančarek, D.: Virtual model of a tube heat exchanger
Janiš, M.: Changing the parameters of assembly in Inventor VBA
Jonáš, P.: Implementation of business intelligence in controlling
Jočiak, R.: The design and implementation of a portal within the specified area of computer science
Juroš, M.: Paperless web system verification of knowledge
Kamenár, P.: Search of the routes roads with the smallest distance
Kecesényi, Z.: Creating an electronic information portal on the topic “Numerical and functional sequels”
Kessel, S.: Virtual model of hydraulic system
Kočišová, J.: Options of a production costs reduction by means of simulation optimisation
Kojnok, J.: Visualization of photovoltaic power plant operation on the touch screen operator dialogue terminal
Koňuch, R.: Information System in the web environment (support modules for full-time combined method of study)
Kopecký, R.: Implementation of the inertial system for mobile robot control
Kopíle, L.: Optimisation of selected strategies for the management of a flexible manufacturing system
Kopúnek, L.: Design and implementation of web hosting based on Microsoft Technologies
Kopilec, L.: A proposal of a central control interface for monitoring and commercial IS for a company with the use of Photomodeler
Kopecký, R.: Design of an information system for Ahold Distribution and control program
Kotšta, M.: Solving input assembly of integrated circuits simulation
Kotrík, M.: Analyses and proposal of an automated data collection solution and data integration into the ERP system from manufacturing lines
Kozma, P.: Design and implementation of web hosting based on Microsoft Technologies
Krajčovič, L.: The virtualisation of Linux domain server cooperating with LDAP
Královič, R.: A simulation of child seat production
Kráčko, J.: Restructuring of the optical data network in a corporate network
Krchlák, T.: Realisation control of the stepper motors by microcontroller
Krumpáš, P.: Software calibration of a digital camera
Krupánszki, M.: Design and implementation of a control system for a dental ambulance
Kurpa, M.: Module for managing attachments in the B2C system
Kurpánszki, M.: Design of heating system regulation
Kurbanberg, M.: Metropolitan multifunctional camera system
Kuprina, A.: Information system for print and online media
Kutena, J.: Improvement to the manufacturing process of interior and exterior doors by simulation

Lečko, J.: Monitoring Vmware ESX Cluster
Lehotský, S.: Database application in WEB (module of production of allocation actions for DPM studies)
Lehotský, S.: Fuzzy temperature control in MATLAB – Simulink
Libóšová, K.: Information system design for the warehouse of a gastronomic facility
Lipnický, M.: A proposal of a central control interface for controlling parameters of digital cameras and portable devices
Matuš, M.: Design intranet portal for company
Mečiř, T.: The design and implementation of small IS-module for a dental ambulance
Mihalík, P.: A proposal of an information system to the technical operation of the transport company
Mihóčka, L.: The issue of implementation of voice transmission over IP protocol
Michaličková, K.: Creating a database assistance program for simulation requirements
Milo, A.: Processing of graphic data in DTP
Minařovič, J.: Calibration of digital camera in Matlab and Photomodeler
Moravčíková, Z.: The design of information system – module of car sales
Mudroch, P.: An application for the creation of courses in a web environment (module for DCM trial)
Nešťický, M.: Implementation of INS for sensing the position and orientation in real time
Obáš, M.: Design and implementation of an information system for the Avon-Shop using UML and UP
Ondrejkovič, J.: Design of system for generating class schedules
Onndruška, J.: Virtual model of a filling line for PET bottles
Págač, L.: Information system design and implementation with design patterns using Java
Peči, M.: The portal for controlling sales channels
Pekar, R.: Content Management System using the jQuery API
Petrových, L.: Implementation of the hill map portal
Pilka, J.: The design of an information system for the manufacturer of sports jerseys
Podkoníček, B.: Implementation of algorithms for the design of technical graphics and diagrams
Predný, M.: Improving the process of production in food production by means of simulation
Púchly, F.: Design of an information system for Ahold Retail Slovakia
Putnok, J.: Simulation application software of an industry regulator
Rašo, O.: A simulation study of sorting and incineration of municipal waste
Rosinsky, M.: A virtual model of the production system
Schavel, F.: A proposal for object security
Siečn, T.: A production simulation of selected food commodities
Šítková, V.: Technical systems for early detection of risks in the operation of the business centre
Skýpala, M.: Creating an electronic teaching portal on the topic of “Graph Algorithms”
Sobota, M.: Design and implementation of virtual object and control program
Štev, T.: Presentation of selected graph algorithms
Spevár, M.: Electronic store in the field of the web
Šroka, M.: Inference Engine of Rule-Based Expert System
Šimúnek, P.: A proposition of informative system for stock control
Šuka, L.: Assessment of accuracy for determining the size of the manufacturing benefit by means of simulation optimisation against classical methods
Šlauka, M.: Visualization of technical drawings
Šternócky, M.: The automatic process treatment and identification of Heineken Slovakia products
Štofán, M.: Network security and MPLS VPN connections
Štulajter, J.: Information Lifecycle Management (ILM)
for SAP system based on file-base archives

Štuller, J.: Optimising the production of plastic windows by simulation

Táčovský, M.: Project and Implementation of information system for a retirement home

Talajka, D.: The technological process of the desktop in the web environment

Taranda, O.: Simulator of network composed of ADAM 4000 modules with a virtual serial interface

Tarr, P.: Creating a 3D model and modifying its parameters using Autodesk Inventor

Tibenský, S.: Searching the shortest road routes using algorithms involved in the determination of distances in graphs and digraphs

Tóth, D.: The utilisation of mobile phones in technical documentation recording

Turčík, M.: The implementation of SCADA and distribution of data via radio modem in the existing dispatcher workplace

Turšík, P.: Planning software for correction planning on machines

Valach, J.: Project of Attendance Information System (AIS) for the IT department

Vávrová, L.: The design of an information system in UML notations for the city library

Vereš, J.: Design optimisation of an assembly line in the environment Witness

Vontszemű, O.: The issue of security of computer networks, using IP protocol filtering

Vystrčil, R.: Virtual model of a manufacturing system

Záhumenský, M.: The design and implementation of the small information system - Production Stock-Control Module

Zelenay, L.: Design measurement and control of a gas boiler

Žák, R.: The utilisation of algorithms which deal with distance determination in graphs and digraphs

PhD Theses

Bartušek, M.: Car automatic safety system for collision avoidance on road danger zones

Haluška, T.: A draft of SOA architecture utilisation for

RESEARCH AT THE INSTITUTE

Areas of Research
- Control systems of technological and production processes (including of the regulation of quality questions, regulation optimisation, intelligent regulation systems, sensitivity and robustness of regulation systems).
- Information and Control systems IR5 (reliability and security of IRS, IRS for safety critical processes, IRS of real time, SCADA systems, PLC).
- Mathematical modeling and system simulation.

Research characteristics
Research at the institute is focused on the informatisation and automation of control processes on all levels of industrial production, meaning technological, production and management with an emphasis on new trends in the mentioned areas (development of intelligent control methods, new products in software aided areas, and new trends in data integration and Knowledge Discovery). The other developing area of research is the mathematical modeling and simulation of dynamic systems with fast feedback, especially in connection with design and effective control of high-frequency oscillators in electronic circuits as well as other technological areas where it is needed to generate non-linear vibrations with the possibility to modify amplitude and frequency of these vibrations.

Areas of expertise:
- Automation and Control of Processes
- Software Engineering and Information Systems

PROJECTS OF THE INSTITUTE

Project title Identification and evaluation of shapes and surfaces of materials scanned by laser confocal microscope

Coordinator Ing. Tomáš Bezák, PhD.

Start Date 01/01/2012

Programme KEGA

Annotation Laser confocal microscopy (LCM) is gradually being applied in many workplaces in Slovakia despite its undisputed financial costiness. Scientific disciplines of biology seem to be the core area where the application of LCM is growing at a particularly high speed, while LCM with an episcopic illumination system typical for metallurgical applications systems is limited. Currently, there are two devices in Slovakia and they may still be considered as unique. When compared to conventional light microscopy, the advantage of laser confocal microscopy is in markedly increased depth of sharpness, reaching a value up to 10 mm at the magnification of 100-times. However, this benefit is achieved with a substantial time consumption of scanning and subsequent need for the robust image-processing software tools. Complexity, robustness and effort for universality of commercial tools results in difficulties with satisfying specific application requirements.

Project title Model of teaching Mathematics by using new technologies

Coordinator Assoc.Prof. RNDr. Mária Mišútová, PhD.

Start Date 10/06/2011

Programme KEGA

Annotation The project deals with the teaching of Mathematics using new technologies in the full-time and part-time study forms in technical universities. In the first stage of the project, designed was the proposal of a teaching model with the use of open sourced mathematical software with the application of the methods supporting creative thinking. In the second stage, multimedia programs as well as e-materials for students will be developed. In the final stage, didactic effectiveness will be verified by means of pedagogical experiment. The final stage will be the implementation of the model into teaching.

Project title Elaboration of interactive multimedia textbook “Mechatronics” for secondary vocational schools

Coordinator Assoc.Prof. Ing. Pavol Božek, CSc.

Start Date 01/01/2012

Programme KEGA

Annotation Various multimedia techniques allow for better, more intensive and efficient perception of information (texts, drawings, pictures, speech, music, animations and videos) in specific subjects. Students are not able to remember the enormous amount of information in the current teaching/learning practice. It is therefore crucial to be able to organise the information, grasp the aim and fundamentals of the subject studied. Multimedia and hypermedia are the right tools for supporting the work with information in the related study material, it is easy to search and focus on it. The project is centred on the preparation and elaboration of a new educational application for engineering secondary schools in the Slovak Republic with the aim of increasing quality of teaching within the subject of “Mechatronics”.

Project title The data mining usage in manufacturing systems control

Coordinator Assoc.Prof. Ing. Pavel Važan, PhD.

Start Date 01/01/2011

End Date 31/12/2013

Programme VEGA

Annotation The project is focused on the use of data mining techniques for gaining knowledge of manufacturing systems. The knowledge will be used in the management of these systems. The simulation models of manufacturing systems will be developed in order to obtain the necessary data about controlled production systems. Various control strategies will be implemented in these simulation models. The researchers will develop a way of storing the data obtained from the simulation models in the data warehouse (it will include thousands of records) and create a data mining model using specific methods and selected techniques for specific problems of production system management. The collected knowledge about production management system and designed parameters of a particular management strategy will be tested on a simulation model of the production system. Proposal of the data-mining methodology for storing operation data of the production process will be an important benefit of the project.
Project title: Research into the monitoring and assessing the non-standard states in the vicinity of a nuclear power plant

**ITMS of project**: 2622020159

**Duration of project**: 04/2012 - 09/2014

**Workplace**: Institute of Applied Informatics, Automation and Mathematics + Qintel, s.r.o. Trnava

**Operational programme**: OPVaV - 2011/2.2/07-SORO

**Annotation**: The project aim is to support research and development in the field of ICT. It will support the economic growth via technological improvement of the system of monitoring and assessing/evaluating of non-standard states in the vicinity of a nuclear power plant. The intention is that the results will markedly influence the environment. The project also supports co-operation between enterprises and universities and sustainable development in three fields: economic (increasing innovativeness, competitiveness and added value of research into small and medium-sized companies; social (life quality, safety and health protection); environmental (power security and environmental protection).

**VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS**

<table>
<thead>
<tr>
<th>Employee</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ing. Tomáš Bezák, PhD. Assoc.Prof.Ing. Pavol Bežák, CSc.</td>
<td>Germany</td>
</tr>
<tr>
<td>Ing. Michal Eliáš, PhD.</td>
<td>Russia</td>
</tr>
<tr>
<td>Ing. Martin Juháš, PhD. Ing. Bohuslavá Juhášová, PhD. Ing. Dominika Jurovatá</td>
<td>Czech Republic</td>
</tr>
<tr>
<td>Ing. Michal Kopeček, PhD.</td>
<td>India</td>
</tr>
<tr>
<td>Alena Kopečková</td>
<td>Austria</td>
</tr>
<tr>
<td>Ing. Gabriela Krčianová, PhD.</td>
<td>USA</td>
</tr>
<tr>
<td>Ing. Júlia Kurnatóvá</td>
<td>Estonia</td>
</tr>
</tbody>
</table>

**MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS**

**IAICT** – International Association of Informatics, Computer Science, Information Technology and Communication

**IAENG** – International Association of Engineers, Hong Kong

**IEEE** – Institute of Electrical and Electronics Engineers, USA

**MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS**

**Association of Slovak Scientific and Technological Societies** Assoc.Prof. RNDr. Mária Mišútová, PhD.

**Mensa Slovakia** Mgr. Marcel Abas, PhD.

**Slovak Association for Geometry and Graphics** Assoc.Prof. RNDr. Mária Mišútová, PhD.

**SSKI - Slovak Society for Cybernetics and Informatics of Slovak Academy of Sciences (member of IFAC)** Assoc.Prof. Ing. Peter Schreiber, CSc.

**MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS**

**Association of Slovak Scientific and Technological Societies** Assoc.Prof. Ing. Pavol Tanuška, PhD.

**Mensa Slovakia** Mgr. Marcel Abas, PhD.

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**SSKI - Slovak Society for Cybernetics and Informatics of Slovak Academy of Sciences (member of IFAC)** Assoc.Prof. Ing. Peter Schreiber, CSc.

**Visits of Staff Members to Foreign Institutions**

- to design and verify the measures aimed at eliminating the information disproportion in the bachelor study programmes in STU MTF;
- to design and verify the measures for increasing the education quality in the Bachelor’s study programmes in STU MTF;
- to design and verify the evaluation of measures in the Bachelor’s study programmes in STU MTF.
PUBLICATIONS (most important publications in 2012)


This part of Annual Report 2012 was verified by Assoc. Prof. Ing. Pavol Tanuška, PhD.
CONTACT

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tel.: +421918646032
fax: +421906068299

INSTITUTE OF INDUSTRIAL ENGINEERING, MANAGEMENT AND QUALITY

EDUCATION AT THE INSTITUTE

STUDY PROGRAMMES
• Industrial Management
• Production Quality (offered from 30/08/2012)
• Production Quality Engineering (offered from 30/08/2012)
• Personnel Policy in Industrial Plant (offered since 01/09/2012)

Number of students (at 30/10/2012) registered on study programmes offered by the institute: 1052
Number of the graduates (2011/2012) of the study programmes offered by the institute: 366

STAFF
• Professors: 6
• Assoc. Professors: 11
• Senior Lecturers: 19
• Research Fellows: 5
• PhD Students: 67

ACTIVITIES OF THE INSTITUTE

08-10/02/2012 - Concluding Conference, two excursions and 9th project meeting of the AUTOCLUSTERS (SEE/A/594/1.2/X) project on the creation of an “International co-operation network of educational and research institutions with sub-contacts and other organisations active in the automotive industry”
27/02/2012 - Meeting with Bauer Gear Motor GmbH
27/03/2012 - “Dialogues with practice” delivered by Dr. h.c. Ing. Jozef Uhrík, CSc.
02/04/2012 - Excursion in Kia Motors Slovakia
13/04/2012 - “Day of the Institute” to celebrate the anniversary of its establishment, presentation of its achievements and the jubilee events. The event was presented by Prof. Ing. Alexander Linczény, CSc.
30/04/2012 - 2nd year of Ph.D. competition on “Innovation in the automotive sector 2012”, for the best thesis focused on the field of innovation in the automotive industry.
17/07/2012 - Visit from the United Arab Emirates, Dr. K. Prakash Vel of “University of Wollongong” in Dubai
09-14/09/2012 - Evaluation of PhD students’ contributions to the Ph.D. competition on “Innovation in the automotive sector 2012”

03/10/2012 - Participation in 15th National Forum of Productivity 2012
11-12/10/2012 - CO-MAT-TECH 2012: International Research Conference
22/10/2012 - “Dialogues with practice” delivered by Ing. Peter Cirka of Johnson Controls, CEO for Central Europe
26/11/2012 - “Dialogues with practice” delivered by Assoc.Prof. Ing. Ján Lešinský, CSc., head of the Institute of Life-long Education at the Slovak University of Technology in Bratislava.
10/12/2012 - “Dialogues with practice” delivered by Assoc.Prof.Ing. Stefan Rosina, PhD., president of Board of Directors and CEO of Matador Holding, a.s.
03/2012 "Innovative good practice" – European conference on gender and innovation-maximising innova-
tion potential through diversity in research organisa-

04/2012 "Gender diversity in industrial research institutions" – conference Women in Industrial Re-
search, session Gendered Innovation – Budapest/Hun-
gary (Assoc. Prof. Ing. Jana Šujanová, PhD.)

06/2012 "Language policy in the Slovak Republic – Die Rolle der Nationalsprachen in Europa –
Cothen/Germany (Assoc. Prof. Ing. Jana Šujanová, PhD.; Assoc. Prof. Mgr. Dagmar Cagáňová, PhD.)

10/2012 "Corporate blogging as an IT manage-
ment innovation tool within the automotive in-
dustry" – Internet as Innovation Eco-System Summit and Exhibition – Riva del Garda/Italy (MSc. Paul Wool-

09/2012 "The issue of education in industrial en-
gineering in relation to the automotive industry in 
the Slovak Republic and its consequences on 
local communities" – 5th Jonas Pranas Alekšis International 
Scientific Conference Pural contemporary vision – Siau-
liai/Lithuania (Assoc. Prof. Ing. Jana Šujanová, PhD.- 
Assoc. Prof. Mgr. Dagmar Cagáňová, PhD. – Assoc. Prof. Ing. Miliš Čambáš, CSc.)

GRADUATE PROFILE

BACHELOR’S PROGRAMMES (B.C.)

Industrial Management
The graduate will gain an understanding of the social and technical systems integrating human resources, in-
formation, materials, devices and processes within the 
complex life cycle of products and services. The gradu-
ate will possess a fundamental knowledge of natural sci-
ences, technical, technological and human disciplines, 
as well as knowledge of informatics and specific knowl-
edge of industrial engineering focused on plant man-
agement, the economy, production management, 
marketing and accounting. The emphasis on practical 
application of the aforementioned knowledge will enable 
the graduate to be able to apply the knowledge and 
skills gained in practice, primarily as a team-leader or 
team-member in middle management or to setup and 
run small businesses or company.

Personnel Policy in Industrial Plant
The graduate will have gained an understanding of the 
strategy of personnel management and its connection with 
the theory and practice of market mechanics. The knowledge and skills gained, including computer liter-
acy, will enable the effective management of human re-
sources. The individual will be able to solve complex personnel problems regarding the requirements and economic, legal and moral restrictions on business. The 
graduate will successfully perform as a personnel or fi-
nance manager on various levels of management in 
large, medium-sized or smaller companies, in agencies 
and in both governmental/non-governmental and 
profit/non-profit organisations. The graduate will be 
well prepared to become a highly competent member of 
management in lower organisational structures, in-
inecluding the field of financial management.

MASTER PROGRAMME (Ing.)

Industrial Management
The graduate will gain a complete university education 
focused on planning, designing, implementing and man-
aging production systems and also creativity develop-
ment in engineering projects or processes. The 
individual will gain an indepth knowledge of natural sci-
ciences, technical, technological disciplines and humani-
ties with expertise in industrial management, company 
management, production management, plant economy, 
thoretical knowledge of operation and system analysis, 
logistics, personnel, investment, finance, innovation and 
information management. The graduate is ready either 
to continue studying at postgraduate level and develop 
a research career in industrial management, or to enter 
the job market immediately. The graduate will success-
fully perform as a middle or top manager in organisa-
tions within various sectors of industry requiring the 
synergy of managerial, economic, technical and soft 
skills and knowledge.

POSTGRADUATE PROGRAMME (PhD.)

Industrial Management
The graduate will have gained a complete university ed-
ucation in Industrial Management focused on the knowl-
edge development in the field of managerial activities, 
tools and methods applied in various types of compa-
nies. The graduate will have mastered research and de-
velopment methods of gaining knowledge autonomously. 
The graduate will be able to develop cre-
ative methods in the field of industrial management and 
design, provide social, technical and managerial systems 
in various types of companies, accelerate the develop-
ment of innovative processes, and apply various man-
gement improvement approaches. The graduate will 
be equipped with the skills to succeed in top managerial 
positions in various types of organisations, consulting 
companies and universities, in both research and teach-
ing careers.

LIST OF SUBJECTS OFFERED BY THE INSTITUTE

- Accounting
- Bachelor’s Project
- Bachelor's Thesis
- Basics of Ergonomics
- Basics of Quality Management
- Business Economy Basics
- Business Economy I, II
- Business Strategies for Small and Medium-sized 
  Enterprises
- Calculation and Prices
- Computer Aided Quality Management
- Controlling
- Customer Protection and Complaint Management
- Designing and Management of Manufacturing Processes
- Master's Project
- Master's Theses
- Dissertation Thesis I, II, III, IV, V, VI
- Economy
- Economy of Non-metallic Materials Production
- Ergonomics
- Exact Methods in Managerial Decision making
- Financial and Investment Management
- Financial Management
- Human Resource Management
- Change Management
- Industrial and Intellectual Property of the Firm
- Information Management -
- Information Technologies II
- Innovation Management
- Integrated Management
- Intercultural Management
- Labour Rationalisation Basics
- Logistics
- Management
- Management Basics
- Management Information Systems
- Management of Investment Progresses
- Management of Projects
- Managerial Ethics
- Marketing
- Marketing Management
- Market Research and Monitoring of Customer Satisfaction
- Marketing Strategies
- Monitoring of Customer Satisfaction
- New Trends in Complex Quality Management
- Operation and Maintenance of Machines
- Operational Research
- Pedagogical Activity I, II, III, IV, V, VI
- Personnel Management
- Practice
- Production Management I, II
- Project Management
- Project of Conformity Assessment
- Project and Process Management in Quality Management
- Quality Audits
- Quality Management Systems
- Quality Management Case Studies
- Research Thesis I, II, III, IV, V, VI, VII
- Standardisation, Certification, Conformity Assessment
- Statistical Methods
- Statistical Methods of Quality Control
- Statistical Methods in Process Improvement
- Strategic Management
- Supply and Distribution Based Logistics
- Tax Management
- Tools and Techniques of Quality Management
- Total Quality Management

GRADUATE THESSES

Bachelor’s Theses

Ančíková, N.: Development and human resources management
Antal, A.: A proposal for organising improvement in an 
industrial company
Babišková, Z.: A study using the measurement and 
monitoring of products in Slovak industrial organisations
Babišková, Z.: Design recommendations for sustainable 
strategies of corporate social responsibility for small and 
middle companies in the field of sustainable production
Bad’urová, B.: Measurement, monitoring and improve-
ment of the processes in an industrial factory
Bad’urová, L.: Analysis of redundancies in LOTN, a. s.
Bajžičková, M.: A proposal of measures to streamline 
the process of selecting and evaluating suppliers of 
LEONTI Autokabel Slovakia
Baleková, S.: The working environment as a moti-
vating factor in the company
Bálintová, M.: A proposal of measures to improve the 
education of employees in TEAM INDUSTRIES, Ltd
Baloghová, E.: Education of employees in Slovnaft 
Montáža a Opirav a.s. Bratislava
Bariš, R.: Design measures to visualize the results of 
business in Vetropack Nemšlov Ltd.
Bartek, P.: Concept of measures – how to make mate-
rial flow more effective in the process of material prepa-
ration in production in Vacuumschmelze Ltd.
Baňínka, S.: Design of a motivation programme for manu-
facturing employees in TRYON Ltd. Brumov-Bylnice
Běhalová, N.: Draft measures for improving the remuneration and motivation and its influence on employment output and working satisfaction in Grafobal a.s.

Bendiková, M.: Forms of employee motivation to improve company culture in Technika s.r.o. Nové Mesto nad Váhom.

Blažo, M.: The proposal of suitable measures to improve the employee educational system in T-Industry Ltd.

Blahutová, M.: Design of basic ergonomic measures to rationalise in Inalfa Roof Systems Slovakia, s.r.o., Krakoňany.

Blážo, R.: Proposed measures to streamline the information flow in the context of Farélica Slovakia, s.r.o., Hlohovec.

Blesáková, V.: Applying the basic tools of quality management in the plant site.

Bobáková, J.: Training of employees as a part of the personnel work in Sapa profile, a.s.

Borovský, J.: Improvement in time structure of the production process in a workplace with a horizontal boring machine in ZTS-LR NaJus Dubnica nad Váhom.


Buchá, P.: Proposal of measures to improve the image of employees in Heineken Slovakia, s.a., Vranov.

Buda, M.: Proposed measures to improve the process of supply in Vetropack Nemšová Ltd.


Černák, M.: Proposal of measures for improving the use of the Internet as a marketing communication tool in Continental Matador Rubber s.r.o.

Chovancová, L.: Analysis of the system of personnel work in the company KONŠTRUKTA – Industry plc. and proposal measures for its development.


Chorvatová, L.: Motivational incentives to employees in TECHNOS, a.s.

Chovancová, L.: Analysis of the system of personnel work in the context of Horden, a.s.


Chvalcová, K.: Analysis of the system of personnel work in VACUUMSCHMELZE, s.r.o.

Chytilová, J.: Proposal of measures for improving the use of business information systems in BESYN, s.r.o.

Chytilová, J.: Draft measures for improving the remuneration system of employees in INAS Kalica spol. s r. o.

Chytilová, J.: A proposal of recommendations for the development of interpersonal skills of managers in Jacket Slovakia, s. r. o.

Chytilová, J.: Draft action in the system of education and training of employees in PCA Slovakia, s.r.o.

Chytilová, J.: Proposal of measures for the utilization of new marketing tools in Jozef Macho ZAMA INTERIER.

Čižmárová, D.: The proposal of measures for improving the work incentives to increase labour productivity in Mozanaiová, B.

Dananaiová, B.: Education of employees in Johnson Controls India Ltd.

Debnár, R.: Measures proposed in the area of recruitment of employees in FERMA Slovakia, s.r.o.

Dedíková, K.: Proposed measures for the use of outdoor activities in the education of employees in HPM Thermaic s.r.o.


Doughtniková, L.: Methods of recruiting, focusing on the interview in ÖMS, s. r. o.

Důza, P.: Proposed measures to improve corporate culture as a tool for motivating employees in Matador Holding, Inc.

Drábková, J.: Proposed measures for advancement and the motivational system of employees at PROHTERM PRODUCTION Co. Ltd., Skalica.

Dvořák, J.: Proposed measures for streamlining the soft skills of employees at Praktik Textil s.r.o., Trnava.

Drottner, P.: Machine capability monitoring and process capability to achieve specified requirements.


Dubček, Ľ.: Proposal of measures to improve the process of selection, adaptation and care about employees in SLOVNAFT MONTÁŽA a.s.

Dudová, M.: Motivational incentives to employees in Johnson Controls India Ltd.


Farkašová, R.: Forms of employee motivation to improve company culture optimisation in Belkaert Hlohovec, a.s.

Fejeda, L.: Analysis of the system of personnel work in Skalica.

Ferencová, L.: Proposal of measures for improving the education system improvement as a method of company culture optimisation in Belkaert Hlohovec, a.s.

Florian, B.: Application of measures of development by using information system in company NES Nová Dubnica s.r.o.

Franklová, P.: Proposed measures to improve the system of recruitment of employees in RIEREK OBVU, s.r.o. Komárno.

Fulek, R.: A proposal of measures for the improvement of recruitment and selection of employees in Continental Matador Rubber s.r.o.

Füsek, M.: A proposal of measures to improve the use of the Internet as a marketing communication tool in Continental Matador Rubber s.r.o.

Gajdošová, L.: Corporate culture in MIBA STEELTEC Ltd. Váble.

Gregušková, M.: Motivational incentives to employees in Continental Matador Rubber s.r.o.

Hašková, K.: The proposal of measures for improvement in the use of marketing activities to promote brand building in Zeliezárnické opravne a strojárne Zvolen, a.s.

Hernághová, J.: Proposed measures for improving the use of business information systems in BESYN, s.r.o.

Hlinka, M.: Analysis of quality assurance in the manufacturing process of GeWiS Slovakia, s.r.o. company.

Holudílková, K.: Recruitment, selection and employing of new employees in PCA Slovakia, s.r.o.

Holáčková, L.: Analysis of corporate culture in the company KONŠTRUKTA – Industry plc. and proposal measures for its development.

Horsek, V.: The proposal of measures for an efficient education of employees in Silcotec Europe (SK), s.r.o.

Hrachová, S.: Labour recruitment, selection and re-recruitment of employees.

Hrmčíčková, L.: Motivational Stimuli of the employees in EC-Technologies s.r.o.

Huciková, J.: A proposal of measures in production and the use the profit.

Hudáková, D.: Valuation of the business financial situation in any company.

Hudec, L.: The development and training of employees in SES Timače.


Hrdličková, V.: Improving the motivational system of employees in SEMIKRON, Ltd. Vrbové.

Chovancová, L.: Analysis of relationships in the workplace.

Ištvánová, M.: A proposal of measures to improve the motivation of employees in the ContiTech Vibration Control Slovakia s.r.o. company.

Jakabovický, D.: Measures proposed in the area of job description creation ZF Boge Elastmetall Slovakia, a.s.

Jakubecký, L.: A proposal for the procedure of applying ergonomic principles of rationalisation in the industrial enterprises in the Slovak Republic.


Jelínek, M.: Application of the continuous improvements principle in the industrial company.

Jurčíková, M.: Proposal of measures to improve the material flow on the tube mill operation in Zeliezárnické Podbrezová, a.s.

Kaloušová, O.: Proposal of measures for the utilisation of new marketing tools in Jozef Macho ZAMA INTERIER.

Kázmér, Á.: Proposals for streamlining the use of statistical methods and tools in the processes of ArcelorMittal Gorovník.

Krajoš, V.: A proposal of measures for the development of management roles in the middle stage of management in Envirál, a.s.

Královivá, K.: Recruitment and hiring of new employees.

Krušliaková, V.: Proposal of measures for an efficient evaluation system of the employees in the selected company.

Kubáč, P.: Proposal of measures to improve adaptation process of the employees in the context of Hollen, Ltd. Trnava.

Kucharcíková, J.: The draft measures to improve corporate culture in INA Skalica spol. s r. o.

Kuklová, M.: Proposal of measures for better utilisation of the marketing mix in the company MAJK, s. r. o., Helpa.

Kurajčíková, P.: Proposal of measures to improve the recruitment system and selection of employees in the company ASSA ABLOY Czech & Slovakia, l.mt.


Kurá, J.: Proposal of measures for improvement of the process efficiency of suppliers services in the company Transplus (Slovakia) s. r. o.

Kurajčíková, P.: Proposal of measures for the utilisation of the continuous improvements principle in the industrial company.

Krutislová, M.: Education of workers as an integral part of the work in employees in PCA Slovakia, s.r.o.

Kuzmová, L.: Package of measures to promote efficiency of book-keeping internal directives in FREMACH, s.r.o.

Kvaznová, K.: Training of employees in the company Climate Control Slovakia s.r.o.
Labuďová, Z.: Quality assurance in the production process in the selected manufacturing company
Lackovič, M.: Suggestions to streamline transportation and manipulation with metal scrap which is produced by plastic recycling
Lamanec, M.: Draft of the basic ergonomic measures of rationalisation in selected workplaces of Slovak Road Administration, Bratislava
Leníček, D.: Draft suggestions for improving the work motivation of employees in KOVOSPOL Ltd. plant.
Lenický, M.: The proposal of measures to streamline the management process in the enterprise Slovnaft a.s.
Lošonská, D.: Proposal of measures for shaping corporate culture in LYCOS-Malthouse, s.r.o., Trnava
Lukáčová, D.: System of personnel working in industrial companies
Lučenec, M.: Draft suggestions for improving the work motivation of employees in KOVOSPOL Ltd. plant.
Magálová, M.: Analysis of communication in the workplace: place energy systems in Emerson, stock company
Magušová, M.: The education of employees in the company Macta, a.s. Púchov
Magurová, Z.: Proposed programme of social enterprise
Malivánko, M.: Proposal of measures to improve the program of professional education in the company Hanlí E-Hwa Automotive Slovakia, s.r.o.
Maťošová, M.: The recruitment, selection and retraining of employees in the company
Matonok, L.: System of management in the company PROTHERM PRODUCTION Ltd.
Máčka, D.: Proposal of measures for improvement of the type and organisation of human resources
Máčka, M.: Proposed measures to improve the work environment in the company
Mádugová, M.: The proposal of measures to streamline the purchase of logistics companies in KENT Slovakia s. r. o., Banská Bystrica
Máliková, P.: A proposal of measures to improve the management process in ZLH PLUS a.s
Máliková, P.: A proposal of measures to streamline the processes of management of inventory and warehouse management in the company SEHWA SK s.r.o.
Máliková, P.: Proposed for a social programme in the company PROTHERM PRODUCTION Ltd.
Máliková, P.: The proposal of measures to solve senior employee training in the company
Máliková, P.: Draft recommendations for the sustainable development of CSR for SMEs in Slovakia in the field of sustainable logistics
Máliková, P.: Draft recommendations for the introduction of a flexible environmental oriented system of balanced indicators of industrial enterprises in Slovakia
Máliková, P.: The proposal of measures for the more effective process of operative logistics in the company PCA Slovakia, s.r.o.
Márkinová, M.: Suggestions for arrangements using the AHP method application to evaluate customers of POSS-SLPC, s.r.o. in the context with corporate social responsibility
Máriášová, M.: System of personnel working in the company
Máriášová, M.: Proposal of arrangements for developing the key employee competences in the area of logistics in Frenach Trnava Ltd.
Máriášová, Mirka: Proposed measures to improve teamwork in the company PROTERM PRODUCTION Ltd.
Máriášová, Mirka: Gauge capability analysis and measurement system analysis
Máriášová, Mirka: Proposal of arrangements for improved corporate culture in ZOS Trnava
Máriášová, Mirka: Academy of enterprises
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Kováčiková, K.: Production capability model for the company TJ Automotive Ltd.
Kováčová, L.: The design of the employees’ personal career planning and management system in the company TIAutomotive Ltd.
Kozák, J.: A project aimed to improve the management of claims in the selected engineering company in Slovakia
Kubáč, M.: A proposal for the improvement of corporate culture by the management in the company, Hammer-bacher SK, a.s.
Kubíčková, D.: A proposal of using the FMEA method for improving product quality in Enics Slovakia s.r.o.
Kubovčiová, L.: A proposal for streamlining the management related to the planned development in PCA Slovakia, s.r.o.
Kubač, M.: A proposal of self-evaluative work for the chosen measure of EFQM model of exceptionality
Kudláčová, J.: The process capability assessment of production of the product “Box Finger Cut”
Ladovcová, M.: A proposal of self-evaluative work for improving the use of project management in the company, COM-KLIMA s.r.o.
Ladovcová, J.: A proposal of self-evaluative work for improving the use of project management in the company,hammer-bacher SK, a.s.
Kubíčeková, D.: A proposal of using the FMEA method for improving product quality in Enics Slovakia s.r.o.
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Kubičková, D.: A proposal of using the FMEA method for improving product quality in Enics Slovakia s.r.o.

Záhorec, P.: Applying appropriate tools and methods for continuous improvement in the selected processes


Zatko, M.: Suggested improvements in the management of production processes in the company AGRO - MOVINO, spol. s r. o., Velký Krtíš

PhD Theses

Andrásová, A.: A proposal for an assessment methodology of the economic investment efficiency in corporate social responsibility

Betínová, Z.: A proposal of the talent management methodology for industrial companies in Slovakia

Bieliak Maretová, M.: The proposal of a methodology for the application of continuity knowledge management in industrial enterprises in the Slovak Republic

Drozdová, A.: The recommendation of a system of accounting management in small and medium sized enterprises

Herbáčsková, A.: Adaptation of marketing information system in business practice

Hodolíková, P.: A proposal for the use of controlling as a tool for the holding’s control

Chatrnúchová, L.: A methodology of the evaluation of the social effectiveness of the investment

Janáč, E.: The proposal of a methodology of synergistic increase to the efficiency of business logistics processes using the radio frequency identification technology

Kelemenová, Z.: The proposal of the methodology of implementation and retention the collaborative management in industrial companies in Slovakia

Koltnérová, K.: A proposal of the methodology of personnel planning in terms of industrial enterprises in Slovakia

Kyzek, J.: The proposal of modifications to the ergonomic programme in order to increase the efficiency of human work for the application in enterprises in Slovakia and abroad

Samšková, J.: A proposal of project communication management methodology as a tool for quality improvement of projects in industrial enterprises in the Slovak Republic

Stacho, Z.: A proposal of complex evaluation methodology of innovative industrial enterprises characteristics

Stankovský, P.: Integrated logistics as the base of raising company competitiveness

Straková, N.: Process application of the ergonomics programme in business practice

Šýč, M.: The use of exact scientific methods for project planning

Talnagová, V.: The impact of the way of measurement of TPA on the calculation of costs of company performance and pricing

Vaškovičová Zíbrínová, E.: A proposal for the methodology of marketing communication in industrial enterprises in the Slovak Republic

Zlocha, J.: A proposal of the motivation system for sustainable development in the context of industrial enterprises

RESEARCH AT THE INSTITUTE

Areas of Research
- Progressive approaches in the area of the Organizational Management
- Financial Management
- Corporate Culture
- Knowledge Management
- Multicultural Management
- Corporate Social Responsibility
- Gender Diversity in Industrial Enterprises and Research Institutions
- Human Resources Management
- Information Quality
- Development of Managerial Competences
- Project Management
- Ergonomics
- Lean Management

Research characteristics
The Institute of Industrial Engineering, Management and Quality has wide scientific cooperation with foreign universities: Leeds University Business School, UK; Czestochowa University of Technology, Poland; Technicolor University Ostrava, Czech Republic; Tomas Bata University in Zlín, Czech Republic; University of Iowa, USA; The "Gheorghe Asachi" Technical University of Iași, Romania; University of Gabrovo, Bulgaria; Ufa State Aviation Technical University, Russian Federation; Izhevsk State Technical University, Russian Federation. The cooperation is focused on the organisation of conferences, the preparation of international projects, study visits, common publications and lectures. During the last years, the Institute has also extended its cooperation with domestic and foreign industrial enterprises and organisations: Create-Net Italy, West-Panova Regional Development Company; Automotive Cluster Croatia, Automotive Cluster of Slovenia, Automotive Cluster Serbia, Automotive Cluster - Vienna Region, VW Slovakia, PSA Peugeot Citroën Trnava, KIA Motors Slovakia, Johnson Manville Slovakia. The cooperation is focused on study visits, diploma thesis, training and participation in international projects. As a result of this cooperation during 2012 the Institute has prepared proposals for 7 VEGA projects, 2 KEGA projects, 2 APVV projects, 5 CEE projects and 1 V4 project.

PROJECTS OF THE INSTITUTE

Project Title Rationalisation and improvement of the "Industrial Management" study programme with the aim to support career consultancy
Coordinator Assoc.Prof. Ing. Jana Šujanová, CSc.
Start Date 01/01/2012
End Date 31/12/2013
Programme ESF
Annotation The project is aimed at improving the industrial management study programme by using ICT and other modern methods of education in terms of career consultancy. Based on the "Principles of education quality management in STU Bratislava" as well as the practice requirements for graduates of the Industrial Management study programme, the project will introduce the changes with the aim to improve the graduates' employability in the labour market.

Project Title Identification of key parameters of sustainable performance of industrial companies under the conditions of a multicultural environment
Coordinator Assoc.Prof. Ing. Miroslav Gambík, CSc.
Start Date 01/01/2012
End Date 31/12/2014
Programme VEGA
Annotation This project investigates the approaches to organisation performance management in terms of performance sustainability. The emphasis is on "sustainability", since currently used models of performance management have a detrimental impact on the decisive groups of employees (long-time over-loading, burnout syndrome, health troubles of various character), decreased their performance and thus also performance of the whole organisation and its competitiveness. The project is aimed at solving the subject under the specific conditions of multicultural organisations (with orientation on industrial companies), requiring the approaches different from those applied in multicultural organisations.

Project Title Concept of the HCS model 3E vs. concept of the Corporate Social Responsibility (CSR)
Coordinator Prof. Ing. Peter Sakál, CSc.
Start Date 03/09/2009
End Date 31/08/2012
Programme LPP Programme
Annotation This project is aimed at disseminating the results of research projects No. 019/2001: "Transferring Industry in Slovakia Through Participatory Ergonomics" (finanically supported by a joint Slovak-American fund for scientific and technical co-operation) and KEGA project of Ministry of Education of SR No. 1331105. Currently, the research continues in cooperation with CHIRANA PROGRESS, s.r.o. Pešťany in the field of sustainable development and Corporate Social Responsibility (CSR). The aim of the research is to contribute to the implementation of Agenda 21 and Lisbon strategy in individual pillars of sustainable development strategy in terms of research and development activity and teaching process in the workplaces of STU MTF Trnava.
The project focuses on the results of the projects worked on in the Institute of Industrial Engineering, Management and Quality of STU MTF in Trnava; VEGA 1/2578/05: Analysis of current world-wide trends of project management, research of current state of the subject in Slovakia and a proposal of its implementation in the conditions of Slovak conditions; ESF 11230220391: Modular system of distant education in project management with elearning and information technologies support; VEGA 1/0941/09: Maturity inspection of project management processes as a tool of increasing competitiveness of industrial companies.

Partial outcome of the above-mentioned projects was the identification of shortcomings in the field of information and information management quality, negatively influencing the projects’ impact.

The project aim is to design a methodology of information quality management in project management of industrial companies in SR.

Research into the factors influencing the selection and implementation of the tools of integrated marketing communication with regard to the information security and customer protection.

The project is aimed at investigating the implementation of the subject “Corporate Social Responsibility Entrepreneurship” into the study programme Industrial Management in the second degree at MTF STU Trnava.

The content of the project concerns NMS as well as IPA to prepare and create the first automotive network in South East Europe. The second level clustering activities proposed by the project are strictly oriented on the activities, which are improving the innovation capacities in the region and improve technology and know-how transfer - improving the innovation circle. The project in the first stage analyses the cluster’s development and best practices across the regions as well as creating the connection with other existing European activities in the automotive clustering. The project focuses highly towards producing concrete results and addresses the main challenges that are particularly specific for SEE region, particularly the same across the whole EU territory. The project is built up on experience from previous activities in the automotive industry (NEAC, Automotive Clusters, Belcar, TCAS, I-CAR-O) and in line with EU policies, especially in clustering and automotive industry. The framework’s project aims to:

- Create the first sustainable network in automotive industry in SEE region with specific focus on innovation activities
- Create partnerships which consist of institutions from New Member States, non-EU members as well as well experienced institutions from EU-15
- Invite in the network not just clusters and other SME supporting facilities but directly also R&D institutions and universities
- Improve innovative capability by realising studies of innovation capacities, exhibition in universities and dissemination outputs of our activities, exchange studies and networking activities
- Prove the concept by realising the project samples and by generating of the proposals to FP7

United Nations (OSN) summit from 20th/22nd September, 2010 regarding the millennium development aims and the present accepted norms. The project also considers ISO 26000 relating to corporate social responsible entrepreneurship

The project is built up on experience from previous activities in the automotive industry (NEAC, Automotive Clusters, Belcar, TCAS, I-CAR-O) and in line with EU policies, especially in clustering and automotive industry. The framework’s project aims to:

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The project brings together Universities, R&D institutions, SME support facilities from EU-15, and evaluating the factors influencing selection and subsequent implementation of the tools of integrated marketing communication in the conditions of various types of organisations. The application of tools should represent an optimum model corresponding with various aspects of information security management in compliance with the EU rules on one hand, and security and safety requirements on the other hand. Project output will be a proposal of the methodology procedure of practical application of evaluation, verification, selection and following implementation of the integrated marketing communication tools in various types of organisations via utilising optimum software with the aim to improve the level of integrated marketing communication in the organisations oriented on customer, product quality and information security.

The project focuses on the results of the projects worked on in the Institute of Industrial Engineering, Management and Quality of STU MTF in Trnava; VEGA 1/2578/05: Analysis of current world-wide trends of project management, research of current state of the subject in Slovakia and a proposal of its implementation in the conditions of Slovak conditions; ESF 11230220391: Modular system of distant education in project management with elearning and information technologies support; VEGA 1/0941/09: Maturity inspection of project management processes as a tool of increasing competitiveness of industrial companies.

Partial outcome of the above-mentioned projects was the identification of shortcomings in the field of information and information management quality, negatively influencing the projects’ impact.

The project aim is to design a methodology of information quality management in project management of industrial companies in SR.

The project is aimed at investigating the implementation of the subject “Corporate Social Responsibility Entrepreneurship” into the study programme Industrial Management in the second degree at MTF STU Trnava.

The content of the project concerns NMS as well as IPA to prepare and create the first automotive network in South East Europe. The second level clustering activities proposed by the project are strictly oriented on the activities, which are improving the innovation capacities in the region and improve technology and know-how transfer - improving the innovation circle. The project in the first stage analyses the cluster’s development and best practices across the regions as well as creating the connection with other existing European activities in the automotive clustering. The project focuses highly towards producing concrete results and addresses the main challenges that are particularly specific for SEE region, particularly the same across the whole EU territory. The project is built up on experience from previous activities in the automotive industry (NEAC, Automotive Clusters, Belcar, TCAS, I-CAR-O) and in line with EU policies, especially in clustering and automotive industry. The framework’s project aims to:

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INSTITUTE OF SAFETY AND ENVIRONMENTAL ENGINEERING

CONTACT

Director  Prof. Ing. Karol Balog, PhD.
E-mail: karol.balog@stuba.sk
Tel.: +421918646041

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Tel.: +421918646023
Fax: +421906066499

EDUCATION AT THE INSTITUTE

STUDY PROGRAMMES

Bachelor’s Level
- Occupational Health and Safety

Master’s Level
- Integrated Safety

Postgraduate Level
- Integrated Safety

Number of the students (at 30/10/2011) registered on the study programmes offered by the institute: 499

Number of the graduates (2010/2011) registered on the study programmes offered by the institute: 143

INSTITUTE DEPARTMENTS

- Department of Environmental Engineering
- Department of Safety Engineering
- Department of Industrial Safety

STAFF

- Professors: 1
- Assoc. Professors: 2
- Senior Lecturers: 10
- Research Fellows: 4
- PhD Students: 22

ACTIVITIES OF THE INSTITUTE

25/01 – 01/02/2012 - Exhibition of equipment within the project “Hybrid electric source for a technical consulting laboratory for the utilisation and promotion of renewable energy sources”

10/02/2012 - Opening of the research and education centre established within the ITMS 262 202 200 56 project “Hybrid electric source for a technical consulting laboratory of utilisation and promotion of renewable energy sources”

06/08/2012 - Online voting to support the Botanical garden

02/09/2012 - 13/09/2012 - International summer school on “Selected issues of safety engineering and utilisation of nuclear power plants within the context of the EU power policy”

04/10/2012 - Co-organisation of a scientific conference “Power sources of regions – presence and future”

30/11/2012 International research conference “Integrated safety 2012”
and assessing safety systems and also utilising knowledge gained during the programme in order to contribute to the design of a safe and healthy working environment.

MASTER’S PROGRAMME (Ing.)

Integral Safety

Graduates from the programme will have gained knowledge in the field of environmental and safety risks management. The graduate will be able to control activities within work and environment safety, carry out risk analysis and related documentation, and propose system measures to increase the efficiency of control systems of integrated safety. After completion of the programme it would be possible for the graduate to secure employment in administration, labour inspectors, technical inspection and environmental inspection, and also in positions of a leader and consultant in engineering organisations dealing with designing and assessing the safety systems in industry, insurance companies and manufacturing.

GRADUATE THESIS

Bachelor’s Theses

Bako, R.: Health and safety while working with motor trucks
Bátorová, M.: Risk analysis for the selected intervention of fire and rescue service members
Blanárik, R.: Safe handling of spent nuclear fuel
Blásařová, Z.: The quality of ozone concentration in various conditions of work procedures activities
Cingel, Z.: Cooling systems assurance
Cížek, F.: OSH in the public administration systems of assessment
Dermisek, M.: Principles for the safe manipulation and transportation of samples of dangerous chemical substances
Díkeyová, V.: A proposal of advancement for working with unwanted radioactivity entering into scrap
Dhrbová, J.: Emergency planning in the handling of hazardous substances
Fedorcová, J.: Safety work with explosives
Fridrichová, A.: The ion exchangers attributes and the disposal methods in nuclear power engineering
Gorincová, S.: Heat flow and its measurement
Grebečí, M.: Health and safety at events in the theatre
Hajdúch, J.: The safety of transport, loading and unloading of cement products
Halenárová, S.: Addressing occupational accidents in selected construction enterprises
Hornícký, J.: Safety at work in the process of commissioning, control and signaling in the context of the railway ways in the Slovak Republic
Horúcka, M.: Determining the influence of fire on the voltage drop and insulation resistance of electrical wiring
Hudecová, K.: New trends in the use of water as an extinguishing agent
Jančeková, M.: Monitoring the safety of blasting
Kaiser, P.: Analysis of residual risks
Kolárik, J.: Safety requirement for the operation of moving railroad engines
Kotučová, M.: Health and safety in the production of steel construction
Král, L.: Emergency planning for chlorine leakage in Slovakia
Král, A.: The lifecycle of intumescent coatings
Královčík, M.: Fire – technical characteristics of plastic packaging from retail chains
Krašnik, I.: Effect of heat flux on thermal resistance of intumescent coating
Laurinčík, J.: Emergency planning in manipulating and handling process liquids
Lehotová, S.: The safety and ergonomic assessment of accounting work
Lešák, M.: Safe work with sewage sludge
Liptáková, M.: The determination of hazardous substances in waste water
Lúžiaková, L.: Complex safety appraisal of ADLO door fabrications
Michelíčková, V.: Risk analysis of the technological line in the stone-pit of Malužín

Mikulčík, R.: Labour safety in maintenance and repair activities within the profession of a mechanic for control and management systems
Mikulová, M.: Comprehensive safety solutions for the storage operation of steel components
Mokrá, V.: Degradation of dangerous organic substances
Novák, V.: Labour safety within the manufacturing of a steel fibre-concrete container
Ondrejčík, M.: Fire Protection in cultural and memory institutions
Pénež, M.: Determination of the coefficient of thermal conductivity established in organic layers of dust and its impact on the propensity to spontaneous combustion
Perlák, M.: Assessing the effectiveness of intumescent coatings
Petrík, P.: The lifecycle of intumescent coatings
Pfeiffer, R.: Safety requirements in the reconstruction of the production plant
Poláč, E.: Risk analysis of activities the Fire and Rescue Service on public roads
Ružbácká, I.: Safety at work blasting in quarries
Schreiber, P.: Methods of risk assessment human factor
Slováková, J.: Hazard storage
Smolka, J.: Chemical hazards and their description
Smišák, J.: Fire protection in the paper industry
Steinbühel, S.: The principles of safe working on machines in the tyre industry

POSTGRADUATE PROGRAMME (PhD.)

Integral Safety

The graduate will have mastered the research and experimental methods within safety and security administration systems and safe working environments. The graduate will be able to develop and apply the theory in accordance with requirements of practice focusing on technical and human aspects of the man-machine environment system. After completion of the programme the graduate will be able to carry out scientific research in teams, bringing solutions to complex tasks of theory and practice, risk management, safe working environment, fire protection and other related sectors. The graduate could operate as a highly qualified expert in institutions of base and applied research, a researcher and teacher in universities, advisor and consultant within engineering organisations dealing with designing and assessing safety systems, as well as in insurance companies.

LIST OF SUBJECTS OFFERED BY THE INSTITUTE

- Assessment of Environmental Effects
- Bachelor’s Project
- Bachelor’s Work
- Basics of Environmental Studies
- Basics of Safety Engineering
- Blast and Fire Protection
- Blast Protection and Industrial Safety
- Connoiseurship of Commodity
- Management of Dangerous Activities
- Psychology of Dangerous Activities
- Danger Effects and Processes Simulation
- Hazardous Materials
- Dissertation Project
- Educational Activity
- Emergency Preparedness for Accidents and hazardous situations
- Engineering Work Environment
- Environmental and Safety Information Science
- Environmental Engineering
- Environmental Chemistry
- Evaluation of Indoor Environment Aspects of OSH
- Fire Dynamics
- Fire Engineering
- Fire and Accident Modelling
- Fire Protection of Buildings
- Fundamentals of Environmental and Safety Information Science
- Hazardous Materials
- Human Reliability in Technical Systems
- Selected Chapters of WSHP Control in Companies
- Technological and Natural Emergencies
- Industrial Toxicology
- Informative Techniques in Risk Analysis
- Information Sources in the Field of Integrated Safety
- Inorganic and Organic Chemistry
- Integrated Management of Systems
- Law and Technical Directions of WSHP
- Major Industrial Accidents
- Risk Management
- Management of Hazardous Operations
- Management Systems of the OSH
- Monitoring of Risk Factors in Environment
- Occupation Safety and Health
- Practice
- Processes of Environmental Technologies
- Progressive Methods of Integrated Protection of the Environment
- Quality Control and Standardization in WSHP Domains
- Research Work
- Risk Analysis Methods
- Risk Control Methods
- Risk Assessment in the Environment
- Risk Theory and Casual Processes
- Safety and Reliability of Systems
- Safety Engineering
- Safety Management
- Safety of Industrial Technology
- Safety of Technical Systems
- Social and Economic Aspects of WSHP
- Technical and Safety Conditions of Materials and Constructions
- Technical Apparatus Risks
- Technical Systems Reliability
- Technologies of Waste Management
- Theory and Management of Safety Control
- Theory of Diagnostics, Maintenance and Repairs
- Thesis / Diploma Work
- Thesis Project / Diploma Project
- Work Safety and Health Protection
**Research at the Institute**

**Areas of Research**
- Fire protection and fire prevention
- Modelling of industrial accidents
- Health and safety aspects of occupational indoor environments
- Biodegradability of cutting fluids
- Advanced oxidation processes
- Renewable sources of energy
- Extinguishing agents and application techniques
- Fire investigation
- Fire hazard of materials

**Research characteristics**
- Laboratory testing
- The research includes the testing of the combustibility and explosiveness of substances, product and wastes in different states, the appraisal of fire-fighting foam and spray properties in the aging process, the monitoring of chosen factors in the work environment, and the appraisal of noise and lighting at the workplace. Research is also conducted to analyse of drinking water quality, determine the biodegradability of cutting fluids and determine organic pollutants using analytical methods.

**Document elaboration**
- The processes are documented for hazard assessment and risk analysis of selected substances, products, wastes and technologies to meet company requirements, fire and technological investigation, protocol for identification of the external effects, explosion protection documentation and fire protection at work with legislation. Risk assessment and risk analysis of fires in industry, implementation of occupational health and safety assessment series (OHASAS), (internal audits, preparation for certification audits) are also compiled.

**Research studies**
- Research studies are conducted in the areas of fire hazards of polymers, wood, industrial powder and flammable material and environment issues in fire protection, foam extinguishing agent and systems, the environmental cost of the usage of foam as extinguishing agents, assessment of biological degradability of selected fire-protection systems and the fire hazard of PVC cables and their protection. Research is also carried out in order to create a knowledge database and expert system for the risk assessment of dangerous substances, products, wastes and technologies, to model the impacts of industrial accidents on the environment, fire modeling and comparison of different types of modelling pro-

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**Svástek, J.:** Safety aspects of the operation of substations  
**Szarka, R.:** Risks of water and bottom sediments sampling  
**Šroba, M.:** Determination and use of fire technical characteristics in practice  
**Štefková, J.:** Transport of dangerous goods exempted from the requirements of ADR  
**Števčik, J.:** Arbitration of ways of hydrogen holding on the level against the explosive security  
**Šveda, M.:** Impairment assessment of predictive maintenance for safety and health at work and fire safety  
**Vargová, A.:** Health and safety at work, protection of staff at CDOP Jednota Travka, SD.  
**Vrátnová, J.:** Environmental and safety audit in the pharmaceutical company  
**Wachter, I.:** Physical risk and its description  
**Zabáková, M.:** The use of fire-fighting foams in practice  
**Zak, M.:** Impact assessment at work with disinfectants  
**Zaňo, R.:** Lighting assessment of the operating room in the railways of the Slovak Republic.  
**Zemlová, J.:** Noise at work in a welding workshop and its consequences.

**Master's Theses**

**Andelková, V.:** Monitoring of selected quality indicators for waste water  
**Baláž, M.:** Risk analysis by method event tree analysis  
**Belianská, V.:** Evaluation of the degradation of hazardous substances by progressive methods  
**Belko, P.:** The estimation of work factors in relation to the safety of transporters of goods transportation  
**Birčák, B.:** Increasing the efficiency of radiation control in the area of discarded atomic power plant A1  
**Bobušová, M.:** Safety in the use of renewable energy sources for biogas production  
**Bobčková, K.:** Possibilities of using a thermal imager for predictive maintenance in the engineering industry  
**Boldiš, P.:** Safety and environmental reporting of organisations with established EMS in SR  
**Borková, P.:** A review of biodegradable metalworking fluids such as Adrana D 2420, Mobilcut 222 and Zubora  
**Bučková, Š.:** Predictive maintenance in the engineering industry  
**Ďurica, A.:** Monitoring of selected indicators of quality in surface waters  
**Ďurčián, M.:** Analysis of factors at work in a biogas production plant  
**Dragulová, Ž.:** Assessment of municipal waste management in Partizánske  
**Ďurechová, D.:** The safety at work on completion of Marčokov locating block 3 and 4  
**Ďurica, A.:** A study into the conditions of electrolytic hydrogen production and its utilisation in fuel cells  
**Fabianová, K.:** A study of biodegradability of selected process liquids Adrana D 2420, Mobilcut 222 and Zubora  
**Fancíčková, K.:** Changes to the optical properties of humic substances in soil affected by fire  

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**PhD Theses**

**Hrušovský, I.:** Investigation of thermal conditions for the self-ignition of solids  
**Kordošová, M.:** Safety level of working conditions for selected groups of employees  
**Očak, P.:** Environmental safety and BAT technologies in waste incineration  

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**Research at the Institute**

**Areas of Research**
- Fire protection and fire prevention  
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- Health and safety aspects of occupational indoor environments  
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grams in the field of materials dispersion to the environment. Studies are conducted into the health and safety aspects of occupational indoor environments, the progress and utilization of small hydro-energetic source in combination with solar equipments for engineering, the establishment of a technical-consulting laboratory for utilising and consequent propagation of solar energy. The exploitation of advanced oxidation processes in the removal of organic pollutants from wastewaters by the use of wastes from production and treatment of metals as catalysts and the establishment of a botanical garden as an instrument for escalation of environmental consciousness of citizens.

Consulting, training and courses
Training and courses are focused on health and safety at work, safety education based on international standards, research coordination for specific application targets and requirements for the increase of the safety of industrial regions. Guidance is also given for implementation of safety characteristics of selected types of wood, wooden composites and polstering materials. The selection of materials will correspond with the materials of products used for internal equipment of buildings. Selection of the determined characteristics will correspond with the key properties important for evaluation of their influence on the origin and development of fires. Results of standardised methods will be compared with the results of laboratory methods. A new method will be designed for the exact evaluation of a cigarette test of polstering materials.

PROJECTS OF THE INSTITUTE

<table>
<thead>
<tr>
<th>Project title</th>
<th>Hybrid power supply for technical consultancy laboratory for the use and promotion of renewable sources and energy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coordinator</td>
<td>Danica Kačková (Zvolen)</td>
</tr>
<tr>
<td>Start Date</td>
<td>01/1/2012</td>
</tr>
<tr>
<td>End Date</td>
<td>31/12/2014</td>
</tr>
<tr>
<td>Programme</td>
<td>VEGA</td>
</tr>
<tr>
<td>Annotation</td>
<td>The research focuses on the quantification of flammability by determining fire, technical and fire-protection of selected materials will be evaluated.</td>
</tr>
</tbody>
</table>

RES construction (hydro-potential, solar, biogas and bioethanol) for the long term testing and promotion. Through the proposed interventions the prestige of research will be increased, which will also lead to increased interest in the search for talent and higher employment in this field. The benefits will be new creative ideas and flexible responses to the needs of small enterprises and their closer cooperation. The resulting effect will be more competitive research teams within national research, greater interest from small and medium enterprises to conduct research focused on innovation in public research institutions, universities and other research centres. Slovak research teams will also compete at the international level, bringing the Slovak research development greater cooperation with the international environment and higher success of Slovak applicants in the 7th Framework Program of EU and other EU initiatives.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

<table>
<thead>
<tr>
<th>Employee</th>
<th>Country</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>prof.Ing. Karol Balog, PhD.</td>
<td>Czech Republic</td>
<td>Slovenia</td>
</tr>
<tr>
<td>Ing.Alica Bartošová</td>
<td>Estonia</td>
<td>Ing. Ivan Hruševský, PhD.</td>
</tr>
<tr>
<td>Ing. Blanka Galbičková</td>
<td>Estonia</td>
<td>Ing. Richard Kuracina, PhD.</td>
</tr>
<tr>
<td>Ing. Kristína Gerulová, PhD.</td>
<td>Poland</td>
<td>Ing. Jozef Martinka, PhD.</td>
</tr>
<tr>
<td>Ing. Jozef Harangozó, PhD.</td>
<td>Czech Republic</td>
<td>Ing. Martin Pastier</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ing. Tereza Rusko, PhD.</td>
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<tr>
<td></td>
<td></td>
<td>Ing. Emília Kaurinova, PhD.</td>
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<tr>
<td></td>
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<td>Ing. Zuzana Turňová, PhD.</td>
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<tr>
<td></td>
<td></td>
<td>Ing. Dominika Urbanová, PhD.</td>
</tr>
</tbody>
</table>

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Slovak Academy of Science / Slovak Botanical Society
RNDr. Miroslav Rusko, PhD.

Slovak National Accreditation Society SNAS
Prof. Ing. Karol Balog, PhD.

Slovak Standards Institute TC 15
Ing. Jozef Martinka, PhD.

Slovak Standards Institute TC 17
Prof. Ing. Karol Balog, PhD.
Ing. Jozef Martinka, PhD.
Ing. Tomáš Chrebet, PhD.
Slovak Standards Institute TC 31
Assoc. Prof. Ing. Mareč Soldán, PhD.

Slovak Standards Institute TC 29
Ing.Jozef Harangozó, PhD.

Slovak Standards Institute TC 72
RNDr. Miroslav Rusko, PhD.

Slovak Standards Institute TC 91
Ing.Ivan Hrušovský, PhD.

Slovak Standards Institute TC 105
Ing.Richard Kuracina, PhD.
Ing.Anna Michalíková, PhD.
Assoc. Prof. Ing. Mareč Soldán, PhD.

Slovak Standards Institute TC 39
Assoc. Prof. Ing. Ivana Tureková, PhD.

Slovak Academy of Sciences / Slovak Chemical Society
Ing. Richard Kuracina, PhD.
Ing.Anna Michalíková, PhD.
Assoc. Prof. Ing. Mareč Soldán, PhD.

Civic Association UMBRA - Union for Management of Biopots and Re - Activities
RNDr. Mareč Sirotiak, PhD.

Slovak Geochemical Association
RNDr. Mareč Sirotiak, PhD.

Slovak Association for Landscape Ecology
RNDr. Miroslav Rusko, PhD.

Slovak Society for Environment – The Association of Slovak Scientific and Technological Societies
Miroslav Rusko, RNDr. PhD.

Futurological Society in Slovakia
Miroslav Rusko, PhD.
MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

Czech Republic Fire and Safety Engineering Association
Prof. Ing. Karol Balog, PhD.
Ing. Jozef Martinka, PhD.

International Institute of Welding IIW
Prof. Ing. Karol Balog, PhD.

European Network Education and Training in Occupational Safety and Health (ENETOSH)
Prof. Ing. Karol Balog, PhD.
International Association for Landscape Ecology
RNDr. Miroslav Rusko, PhD.

International Association of Fire Safety Science
Ing. Jozef Martinka, PhD.

PUBLICATIONS (most important publications 2012)


This part of Annual Report 2012 was verified by Prof. Ing. Karol Balog, PhD.
1. The Division of Knowledge Management is the technical-administrative and service unit of the Faculty which provides activities and functions in the field of the academic library, publishing and public relations.

2. The Division of Knowledge Management is responsible for:
   a) processes and operations of the academic library which includes:
      - the storage of research and bibliographic information, in addition to coordination and provision of knowledge management advice for the Faculty,
      - storage and registration of qualification theses,
      - the provision of a workplace for the storage of Faculty publications and their references,
      - the provision and processing of information funds according to the Faculty profile and the provision of bibliographic-information services on the basis of user categorisation,
      - administration of bibliographic-information databases related to the academic activities of the Faculty and participation by creating and accessing file catalogues,
   b) operation of the Faculty publishing house and the provision of editorial activities
c) public relations activities of the Faculty
d) acting as a point of contact between the Faculty and the alumni society.

PRIORITIES OF THE DIVISION OF KNOWLEDGE MANAGEMENT

PROJECTS OF THE DIVISION OF KNOWLEDGE MANAGEMENT IN 2012:

<table>
<thead>
<tr>
<th>Project title</th>
<th>Centre of knowledge organisation of intellectual property</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type of Project</td>
<td>Operational programme: research and development</td>
</tr>
<tr>
<td>Number of Project</td>
<td>ITMS 26220220054</td>
</tr>
<tr>
<td>Responsible Supervisor</td>
<td>PhDr. Květoslava Rešetová, PhD.</td>
</tr>
<tr>
<td>Time Period of Project</td>
<td>2010-2012</td>
</tr>
<tr>
<td>Annotation</td>
<td>The project was approved as part of the Slovak Ministry of Education project call for the operational programme – research and development. The aims of the project is the creation of a centre with the functions of a virtual library and digital archive, complex care of rights of intellectual properties, expert research and the creation of an education workplace for intellectual property. The project will be a response of the trends for the development of a knowledge Faculty as a knowledge society centre. It will represent a model of knowledge management which is defined on the basis of information surveys, information behaviour, knowledge organisation, interaction and access to information.</td>
</tr>
</tbody>
</table>
ACTIVITIES OF THE DIVISION OF KNOWLEDGE MANAGEMENT IN 2012:

Academic Library
- analysis of renowned publishing houses
- presentation of Master Journal List in the premises of Thomson Reuters
- export of data into the central register of publication activity
- categorisation of publication activity according to accreditation criteria
- continual digitalisation of final theses
- consultancy and verification of sources for publishing (verification of creditability of sources for the MTF outputs)
- modification and restructuring of the AL webpages

Publishing House
- publishing activity in the field of electronic textbooks, series of monographs, MTF journals, proceedings
- coordination of the process to add the Faculty journals to the Versita system (journals are indexed in the current databases: RePeC, Astrophysics Data System, INSPEC and TEPMA database
- implementing the changes of the statute of editorial activity, including administration of anonymous reviewing
- updating and administering the publishing portal of MTF
- providing the English translation of the “Research papers” journal on the Faculty website
- mapping the publication space in the publishing houses of Pearson and Cengage for STU MTF
- introducing custom publishing at MTF
- updating the Slovak language corner on the publishing house webpages
- modification and restructuring of the publication house webpages

Department of Public Relations
- establishment of the virtual sight-seeing of STU MTF
- English translations of the main website sections
- monthly schedule providing information on the Faculty events
- supplying information to the webpage of companies and the Faculty for economic practice (in co-operation with Division of Academic Activities)
- preparation of the Annual Report 2012
- innovation of poster display
- implementation of the new re-design of STU, including the new Faculty logo
- responsibility for the website and monitoring of the news
- provision of updates to websites of the Institutes
- update of the MTF photo-gallery portal
- acquisition of the technology museum
- activities related to promotion of the Faculty in the media
- displays at the exhibitions: International Engineering Fair in Brno, Exhibition of Centres of Excellence in Bratislava and an exposition of photographs of STU MTF
- regular organisation of Thursday afternoon meetings (until November 2012)
- activity to support the Bank of Quality - Alumni MTF society
- production of invitations, business cards, leaflets and posters
- regular announcements in print media (Spectrum, Trnavský hlas, Novinky z radnice, Produktivity and Innovation)
- video-recordings of events
- organisation of the Faculty activities guaranteed by the division (New Year’s meeting, MTF Day, St. Nicholas Day, International Children Day)
- organisational support for shooting the documentary “Spectrum of Science”
- modification and restructuring of the PR webpages (including presentation map)

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS
Slovak Association of Libraries – membership of the whole academic library

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS
Knowledge Management Professional Society (KMPPro)
PhDr. Kvetoslava Rešetová, PhD.

Slovak Academy of Management (SAM)
PhDr. Kvetoslava Rešetová, PhD.

Association of Authors of Scientific and Research Literature (SAVOL)
PhDr. Kvetoslava Rešetová, PhD.

PUBLICATIONS

Rešetová, Kvetoslava: The marketing concept in an academic environment. In Research papers. Faculty of Materials Science and Technology Slovak University of Technology in Trnava. - ISSN 1336-1589. - Vol. 20, No. 32 (2012), pp. 28-34.


This part of Annual Report 2012 was verified by PhDr. Kvetoslava Rešetová, PhD.
1. The Division of Academic Activities is the administrative-service division of the Faculty which provides administrative and service activities connected with the study and research activities of the Faculty, the foreign relations of the Faculty and the system of quality in the pedagogical process.

2. The Division of Academic Activities is responsible for:
   a) recording the student life cycle and related activities for all three study degrees (Bc., Ing., PhD.),
   b) processing and administration of admission procedures in all three study degrees,
   c) preparing of publicity materials directed to applicants for study,
   d) processing of a complex agenda for motivational and social scholarships,
   e) recording of research projects and grant activities,
   f) organising of business and study travel for the Faculty employees and students abroad,
   g) organisation of development support for the international contacts of Faculty employees and students with universities and other foreign institutions, and support of their participation in international programs,
   h) organisation of growth in the complex scientific academic qualification of the Faculty employees – including habilitation and inauguration procedures,
   i) organising and administration of agendas related to activities for defence of dissertation theses, habilitation and inauguration commissions,
   j) provision of a complex agenda for meetings of the Faculty Scientific Board,
   k) organisation and administration of the accreditation process and implementation of a system of quality,
   l) administration of agendas connected with awards for the Faculty and memberships in scientific communities,
   m) organisation of the Faculty academic ceremonies,
   n) organisation of activities related to the promotion of companies and presentations of companies with the aim of providing job offers to the Faculty students.

PRIORITIES OF THE DIVISION OF KNOWLEDGE MANAGEMENT

Head of the Division Ing. Jana Štefánková contributes to the project (2010-2012) Knowledge management system of monitoring instruments of the graduates’ employment within the integration into the EU.
ACTIVITIES OF THE DIVISION OF ACADEMIC AFFAIRS IN 2012:

- Organisation of the International Doctoral Seminar 2012
- Organisation of the Students Research Conference at the Faculty 2012
- Organisation of the "Open-house Day at MT STU"
- Organisation of "Doctoral Week"
- Organisation of promotional activities, presentation events and preparation of collated materials for study
- Participation at education trade fairs
- Organisation of presentation/promotion activities delivered by companies with the aim of providing job offers to the Faculty students
- Organisation of questionnaire on student satisfaction with study (study conditions, level of teachers – study conditions, teacher qualifications and the quality of education process)
- Cooperation in organising the "New-year's meeting of employees"
- Maintenance of the web page including information for Faculty and students, throughout the year
- Maintenance of the Academic Information System (AIS)

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

The Slovak Academy of Management
Ing. Jana Štefánková

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

SEFI- European Society for Engineering Education
Ing. Jana Štefánková

PUBLICATIONS


This part of Annual Report 2012 was verified by Ing. Jana Štefánková
DIVISION OF COMMUNICATION AND INFORMATION SYSTEMS

1. The Division of Communication and Information Systems is a technical-administrative and service Faculty unit which provides procedural, consultative and informational services in the area of communication and information technology to other organizational units of the Faculty. This division prepares documents for acquisition, maintenance and repairs of the Faculty information technology.

2. The Division of Communication and Information systems is responsible for:
   a) processing and administration of Faculty computer systems,
   b) provision of casual maintenance and repairs to devices of the Faculty information technology and infrastructure,
   c) provision of consultation services for the system and selected application program equipment,
   d) development, innovation and implementation of technical and program means for the Faculty’s information technology,
   e) organisation of training and short-time courses for users of information technology, training of application program equipment and operation of the computer network,
   f) creation, development, innovation and distribution of the Faculty’s computer network and its connection to the university network,
   g) provision of IT devices to the Faculty workplaces in cooperation with directors of institutes and heads of divisions,
   h) casual repairs of technical devices as required,
   i) support for cooperation with the Centre of Information Technology STU and other information workplaces at STU,
   j) provision of suggestions for short-term and long-term plans for the implementation of information technology and the preparation of documents for decisions made by the management of the Faculty,
   k) entrepreneurship activity,
   l) issuance of permissions for connection of devices to the Faculty computer network,
   m) administration of the Faculty servers and components of the Faculty information system.

PRIORITY OF THE DIVISION OF COMMUNICATION AND INFORMATION SYSTEMS

1. Support of university infrastructure to improve the conditions of education.

   Number of Project: 5.1.2 and 5.1.3
   Responsible Supervisor: Ing. Jaroslav Otčenáš
   Time Period of the Project: 2010-2012
   Annotation: The aim of project is to create the university infrastructures and modernisation of their internal equipment to improve the conditions of the education process. The project results will be the modernisation of computer networks, a creation of a data centre building on Bottova and Botanická streets, improvement of the printing system, and modernisation of classrooms. In the classrooms, data projectors and other modern education tools will be provided. In the Faculty buildings, there will be additional internet access for students. Additionally, multimedia classrooms will be created and the number of connection points for WiFi internet will be increased. The next important step is the creation of information Faculty security, especially by network monitoring, firewall solutions for all LAN MTF, and provision of computers for students in the dormitory.

PROJECTS OF THE DIVISION OF COMMUNICATION AND INFORMATION SYSTEMS IN 2012

<table>
<thead>
<tr>
<th>Project title</th>
<th>Support of university infrastructure to improve the conditions of education.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of Project</td>
<td>5.1.2 and 5.1.3</td>
</tr>
<tr>
<td>Responsible Supervisor</td>
<td>Ing. Jaroslav Otčenáš</td>
</tr>
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</tbody>
</table>

CONTACT

Head of the Division
Ing. Jaroslav Otčenáš
e-mail: jaroslav.otcenas@stuba.sk
tel: +421 917 215 774

Address
Paulínska 16, 917 24 Trnava, Slovak Republic
+421 33 55 11 033, fax +421 906 068 299

DEPARTMENTS

- Department of Information Systems Operation
- Department of System and Technical Services

STAFF:

- Department of Information Systems Operation: 7
- Department of System and Technical Services: 6
ACTIVITIES OF THE DIVISION OF COMMUNICATION AND INFORMATION SYSTEMS IN 2012

- active help in organising SANET - connection of secondary and elementary schools to the central node of the internet, which is located at the Faculty
- reconstruction of the IT infrastructure
- administrating of the Mobile data center with server and storage backend technologies
- network Intrusions detection and prevention
- servers installing and maintaining
- developing of web portals for Faculty needs (www.idssmolenice.sk, dokumenty.mtf.stuba.sk and foto.mtf.stuba.sk)
- WiFi Access points administration (Cisco WLC)
- implementation of system for net points regulation (LMS)
- management of UPC for servers and data storages
- administration of CCTV and security system
- mobile (cellular) and landline phones agenda administration
- preparation of transition to the Active Directory for whole faculty.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

SANET – Slovak Academic Network

PUBLICATIONS:


This part of Annual Report 2012 was verified by Ing. Jaroslav Otčenáš
DIVISION OF ECONOMIC AND ESTATE ACTIVITIES

DEPARTMENTS
- Department of Operations and Maintenance
- Department of Estate Management
  - Facility: Student Dormitory
  - Facility: Student Canteen

STAFF: 103
- Department of Operations and Maintenance: 52
- Department of Estate Management: 9
- Student Hostel and Canteen
  - Facility: Student Dormitory: 32
  - Facility: Student Canteen: 10

PRIORITY OF THE DIVISION OF ECONOMIC AND ESTATE ACTIVITIES
- reconstruction of the indoor swimming pool
- reconstruction of floors in the student dormitory
- implementation of an innovative catering system
- verification of agreements connected with the Faculty maintenance
- provision of a complete economic agenda of the Faculty’s student dormitory
- co-organising of Faculty events

This part of Annual Report 2012 was verified by Mgr. Elena Nemetzová
**DIVISION OF PERSONNEL AND ORGANISATIONAL ACTIVITIES**

**Contact**

Head of the Division
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**Departments**

- Personnel Department
- Department of Employment and Economic Development
- Payroll Department (Wages and Salaries)
- Department of Safety & Health Protection at Work, Civilian Protection and Fire Safety
- Department of Security Systems

**Staff:** 11

- Dean’s secretariat: 3
- Personnel Department: 2
- Department of Employment and Economic Development: 2
- Payroll Department: 2
- Department of Safety & Health Protection at Work, Civilian Protection and Fire Safety: 1
- Department of Security Systems: 1

**Priorities of the Division of Personnel and Organisational Activities**

1. The Division of Personnel and Organisational Activities is the administration-service unit of the Faculty. It is responsible for securing all administrative and service activities connected with hiring and rewarding of the Faculty employees, social and health insurance of employees, recording and processing of income issues, activities of the Dean’s secretory office and the security systems of the Faculty.

2. The Division of Personnel and Organisational Activities is responsible for:
   a) the personnel records of the Faculty employees,
   b) preparing a list and the structure of obligatory documentation which is processed by the central Division of Personnel and Organisational Activities and particular divisions and workplaces of the Faculty it has a right to control,
   c) operation of an information system for personnel work including administration of a system of the workplaces at the Faculty,
   d) processing a system for remuneration of employees including preparation of documents for the wage policy of the Faculty,
   e) preparation and organisation of interviews for the work positions of leading employees at the Faculty and pedagogical employees at institutes,
   f) activities according to the law on protection of personal data, operation of the Dean’s office
   g) Organisation of Safety & Health Protection at Work, Civilian Protection and Fire Safety

**Activities of the Division of Personnel and Organisational Activities in 2012**

- Charity event: Christmas bazaar
- Meeting of the Faculty employees at the occasion of 25th anniversary of the Faculty establishment
- Management of the attendance system ESED

**Publications:**


This part of Annual Report 2012 was verified by Ing. Jaroslava Durišová
CENTRE FOR TECHNOLOGY TRANSFER

PRIORITIES OF THE CENTRE FOR TECHNOLOGY TRANSFER

Priorities of the Centre for Technology Transfer involve the management of structural funds and implementation of projects for both research and practice. The workplace has expertise in managing the Faculty and university projects as well as international co-operation projects.

The tasks of the Centre for Technology Transfer are as follows:
- Preparation and technical provision of the projects in the initial launch,
- Implementation and administrative provision of projects,
- Economic activities in the initial launch and the project implementation phase,
- Evaluation, statistics and reports on the projects, both internal – to the Faculty management, and external – to STU, Managing Authority (MA), Intermediate Body under the Managing Authority (IBMA), agencies and inspection bodies,
- Publicity of projects,
- Provision of procurement processes by a professionally qualified person,
- Provision of entrepreneurial activity.

ACTIVITIES OF THE DIVISION OF ECONOMIC AND ESTATE ACTIVITIES IN 2012

- coordination of public procurement projects
- new contacts with domestic and foreign research and education organisations
- coordination of bidding processes and creation of methods for bidding processes at the Faculty, supervision of plans for bidding processes at the Faculty
- monitoring of project acquisition according to the Faculty profile
- development of the agenda for the Faculty entrepreneurial activity

MEMBERSHIP IN PROFESSIONAL ORGANISATIONS

Certified member of the IPMA (International Project Management Association) project tea
Ing. Peter Halada

CONTACT

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tel/+421918646057  fax/ +421906068299

STAFF: 8
DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

CONTACT
Head of the Division
Ing. Milan Petráš, PhD.
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DEPARTMENTS
consists of three sections:
• Humanities
• Professional Language Communication
• Physical Education and Sport

Besides teaching, the Department staff are involved in research projects.

STAFF: 20

The Department of Humanities and Social Sciences was established on 01/01/2012, after the closing of the Institute of Engineering Pedagogy and Humanities.

ACTIVITIES OF THE DEPARTMENT IN THE YEAR 2012

05/11-22/11/2012 - UNUcert course; 27/11.–written examination; 04–06/12–oral exams;
29/03/2012 - Student Research Conference;
10-11/03/2012 - The 38th International Swimming Meeting for students “Trnava Grand Prix”
22/06/2012 - Tennis tournament for the STU employees “Teacher’s Cup”

The key tasks and aims of the Department include:
- professional preparation of the Faculty students in the field of human and social sciences in order to support their development and enhance and develop a social dimension to the engineering students’ personalities;
- provision of professional English language training;
- physical training and sport to enhance the health and wellbeing of the Faculty students;
- preparation of students majoring in the study programme of Personnel Policy in Industrial Plant in the field of human and social sciences.

PRIORITIES OF THE DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES

The projects of the Department in 2012:

VEGA 1/0226/12 Correspondence of Ján Kvačala 1860-1934

KEGA (026STU-4/2012) Students of Slovakia at the Prague and Brno technical universities in the interwar period
Research period: 2012 – 2014. Principle investigator: L. Bernát. The project studies the social, confessional and nationality structure of the students of Slovakia at the Prague and Brno technical universities, as well as formation of technical intelligentsia in Slovakia in the interwar period.

KEGA (052STU-4/2013) Application of the standards of critical thinking in the innovation of the subject “Introduction into scientific work at STU”
Research period: 2013 – 2015. Principle investigator: M. Bednáriková. The project is focused on the innovation of the subject “Introduction into scientific work at STU”, accentuating the method of systems approach towards the development of critical thinking and research competences within Master’s study. Proposal of the standard system for the field of critical thinking development and selected cognitive abilities of the engineering university students, as well as the framework for their evaluation are in compliance with the European Qualifications Framework and the National Qualifications Framework.
MEMBERSHIP IN PROFESSIONAL ORGANISATIONS

CASAJC
(Czech and Slovak Association of Language Teachers at Universities)
Gabriela Chmelíková
Emília Mironovová
Dagmar Rusková

UNIcert
(Foreign language certificate for universities)
Gabriela Chmelíková

Czech and Slovak Association of the School Psychologists
Silvester Sawicki

CEDOFOP
(European Centre for the Development of Vocational Training)
Silvester Sawicki

Association of Process-oriented Psychotherapy in the Slovak Republic
Silvester Sawicki

Slovak Scientific Society for Physical Education and Sport
Rastislav Hlavatý
Marián Merica

Slovak Swimming Federation
Rastislav Hlavatý

Slovak Tennis Association
Elena Lukačovičová

Slovak Historical Society
Libor Bernát

Slovak Pedagogic Society
Libor Bernát

This part of Annual Report 2012 was verified by PhDr. Emília Mironovová
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