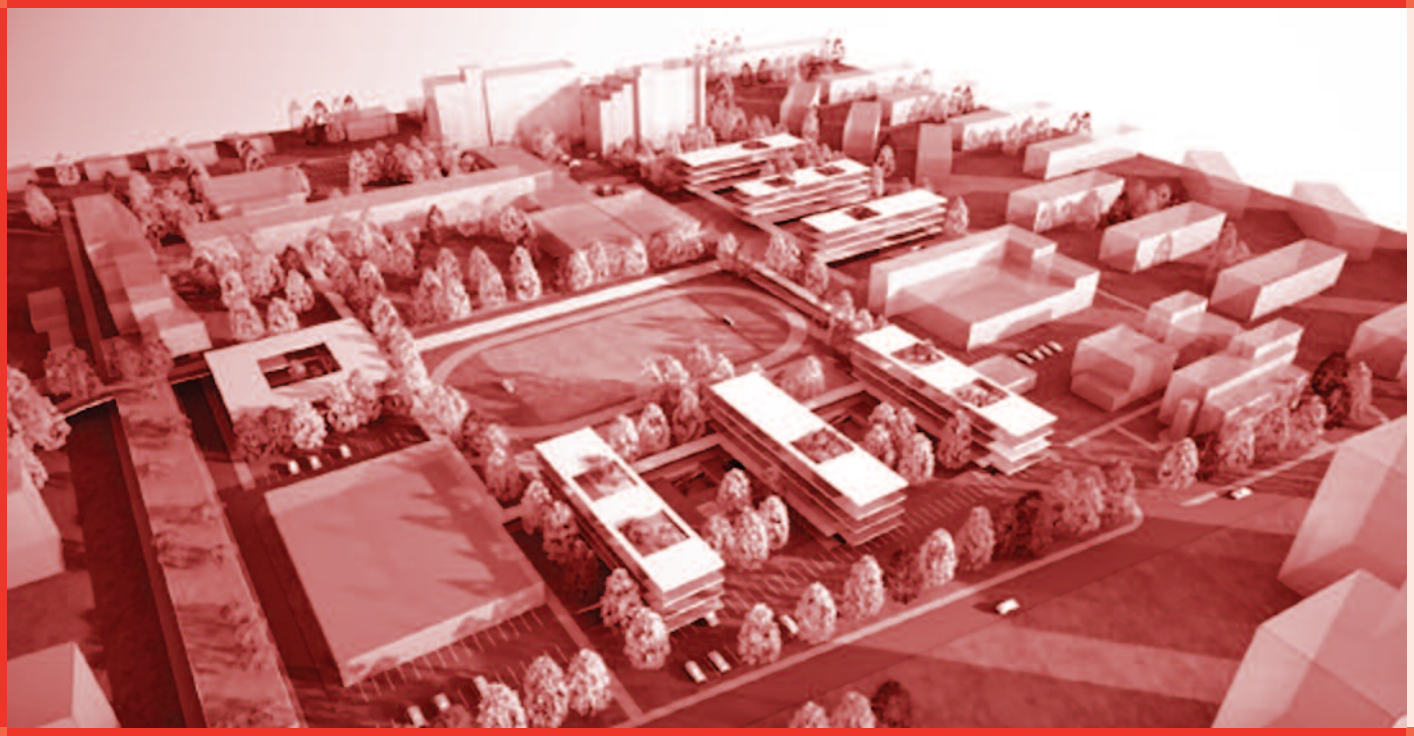


ANNUAL REPORT 2014

FACULTY EDUCATIONAL ENVIRONMENT
PROSTREDIE VZDELÁVANIA NA FAKULTE

STU
MTF

SLOVAK UNIVERSITY OF TECHNOLOGY IN BRATISLAVA
FACULTY OF MATERIALS SCIENCE AND TECHNOLOGY IN TRNAVA

ANNUAL REPORT 2014

PROSTREDIE VZDELÁVANIA NA FAKULTE

FACULTY EDUCATIONAL ENVIRONMENT

PREFACE

For the Faculty, 2014 was a year of change. Dr.h.c. Prof. Dr. Ing. Oliver Moravčík ended his term in office as the Dean. It was a period of turbulent changes in the Faculty's development, which brought considerable achievements, including the Faculty's position in the rating and ranking evaluations (the most significant improvement amongst engineering faculties in Slovakia), or the raising of extra budgetary funds from the European Structural Funds (during the period 2007 to 2014, we received a total of € 90 million). A milestone in the Faculty's development was the beginning of the University Scientific Park construction. Special attention was also devoted to the elaboration of the accreditation file, the results of which will be known in 2015. Let me thank the former Dean and all staff involved in the above-mentioned achievements for all their efforts for the benefit of the Faculty.

The following are the priorities of the new Faculty Management:

- Successful completion of the University Scientific Park CAMBO construction.
- Building the devices and human resources for research and development within the structural funds, and primarily to establish the Faculty in HORIZON 2020 projects as an acceptable partner for European and world-wide research and education.
- Retaining the A-evaluation of the Faculty in the processes of complex accreditation and its position within STU.
- Supporting cooperation with practice and sustainable relations.
- Significantly raising the interest in the studies at the Faculty.

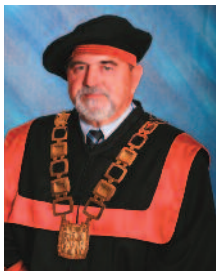
My slogan for the forthcoming period remains unchanged as I declared it during the Dean's election:

Promote the Faculty goodwill via honest high-quality work.

Prof. Dr. Ing. Jozef Peterka
Faculty Dean

MANAGEMENT OF THE FACULTY

01/2014 – 09/2014



Dean of the Faculty

Dr. h. c. prof. Dr. Ing. Oliver Moravčík

Vice-deans

prof. Dr. Ing. Jozef Peterka
- *Development*
- *Information Technologies*
- *Know-how Transfer*
- *Prognostics*

doc. RNDr. Mária Mišútová, PhD.
- *Bachelor's Degree*
- *Accreditation of Bachelor's Degree*
- *Motivation Scholarships*
- *Study Promotion*

doc. Ing. Peter Schreiber, CSc.
- Master's and PhD Degrees
- Accreditation of Master's and PhD Degrees
- Student Social Affairs
- Education Quality, Educational Process Inspection

prof. Ing. Peter Grgač, CSc.
- Research
- International Relations
- Professional Development of Academic Staff

doc. Ing. Helena Vidová, PhD.
- Internal Relations
- Public Relations
- Publishing Activity
- Social Programmes for Staff
- Security System
- ALUMNI

10/2014 - 12/2014

Dean of the Faculty

prof. Dr. Ing. Jozef Peterka

Vice-deans

prof. Ing. Miloš Čambál, CSc.
Vice-Dean
for Research

prof. Ing. Milan Marônek, PhD.
Vice-Dean
for Internal and International Relations

doc. Ing. Peter Pokorný, PhD.
Vice-Dean
for Development

doc. Ing. Peter Schreiber, CSc.
Vice-Dean
for the Educational Process

INSTITUTES OF THE FACULTY

INSTITUTE OF MATERIALS SCIENCE
INSTITUTE OF PRODUCTION TECHNOLOGIES
INSTITUTE OF PRODUCTION SYSTEMS AND APPLIED MECHANICS
INSTITUTE OF INDUSTRIAL ENGINEERING AND MANAGEMENT
INSTITUTE OF SAFETY, ENVIRONMENT AND QUALITY
INSTITUTE OF APPLIED INFORMATICS, AUTOMATION AND MATHEMATICS
RESEARCH CENTRE OF PROGRESSIVE TECHNOLOGIES

DIVISIONS OF THE FACULTY

DIVISION OF COMMUNICATION AND INFORMATION SYSTEMS
DIVISION OF ACADEMIC ACTIVITIES
DIVISION OF KNOWLEDGE MANAGEMENT
DIVISION OF ECONOMIC AND ESTATE ACTIVITIES
DIVISION OF ESTATE ACTIVITIES
DIVISION OF PERSONNEL AND ADMINISTRATION

FACULTY WORKPLACES

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES
TRAINING CENTRE in KOMÁRNO
TRAINING CENTRE in DUBNICA n./VÁHOM

FACULTY FACILITIES

STUDENT HOSTEL AND CANTEEN

SCIENTIFIC BOARD (UNTIL 31/10/2014)

Chair:
Dr.h.c. Prof. Dr. Ing. Oliver Moravčík

Members:
Prof. Ing. Karol Balog, PhD.
doc. RNDr. Mária Behúlová, CSc.
Prof. Ing. Miloš Čambál, CSc.
Prof. Ing. Alexander Čaus, DrSc.
Prof. Ing. Peter Grgač, CSc.
doc. Ing. František Horňák, PhD.
doc. Ing. Andrea Chlpeková, PhD.
Prof. Ing. Jozef Janovec, DrSc.
Prof. Ing. Peter Jurči, PhD.
doc. Ing. Mária Kapustová, PhD.
doc. Ing. Martin Kusý, PhD.
Prof. Ing. Ján Lokaj, PhD.
Prof. Ing. Milan Marônek, PhD.
Prof. Dr. Ing. Jozef Peterka
Prof. Ing. Jozef Sablik, CSc.
Prof. Ing. Peter Sakál, CSc.
doc. Ing. Peter Schreiber, CSc.
Prof. Ing. Maroš Soldán, PhD.
Prof. Ing. Peter Šugár, CSc.
doc. Ing. Pavol Tanuška, PhD.
Prof. Ing. Koloman Ulrich, PhD.
doc. Ing. Pavel Važan, CSc.
Prof.h.c. Prof. Ing. Karol Velíšek, CSc.
doc. Ing. Helena Vidová, PhD.
doc. Mgr. Róbert Vrábeľ, PhD.

External members:

vis. Prof. Ing. Peter Fodrek, PhD.	The First Welding Association, a.s. Bratislava (Slovakia)
doc. PhDr. Ing. Aleš Gregar, CSc.	University of Tomáš Baťa, Zlín (Czech Republic)
Prof. Dr.- Ing. habil. Peter Husár	Technical University, Ilmenau (Germany)
Prof. Ing. Ľubomír Jahnátek, PhD.	Ministry of Agriculture and Rural Development SR
Ing. Matej Korec, PhD.	VÚJE, a.s. Trnava (Slovakia)
vis. Prof. Ing. Ľudovít Kupča, PhD.	VÚJE, a.s. Trnava (Slovakia)
Ing. Juraj Lapin, DrSc.	ÚMMS SAV, Bratislava (Slovakia)
Prof. Ing. Ervín Lumnitzer, CSc.	Technical University, Košice (Slovakia)
Prof. Ing. Milan Oravec, PhD.	Technical University, Košice (Slovakia)
Prof. Dr. Ing. Milan Sága	University of Žilina, Žilina (Slovakia)
Dr. Ing. František Simančík	ÚMMS SAV Bratislava (Slovakia)
vis. Prof. Ing. Daniel Švrček, PhD.	Agrolet, s r.o. Bratislava (Slovakia)
Prof. Ing. Jozef Zajac, CSc.	Technical University, Prešov (Slovakia)

HONORARY MEMBERS OF THE SCIENTIFIC BOARD

Prof. Dr.Sc. Dr. Ing. Michael E. Auer	IGIP (Austria)
vis. Prof. Ing. Miroslav Božík, PhD.	JAVYS a.s. Bratislava (Slovakia)
Ing. Peter Doll	SACHS a.s. Trnava (Slovakia)
Prof. Ing. Aleš Dudáček, PhD.	VŠB TU Ostrava (Czech Republic)
doc. Ing. Fedor Gömöry, DrSc.	SAV Bratislava (Slovakia)
Prof. Dr. Ing. Bela Illes	FMEI Miskolc (Hungary)
Prof. Ing. Jiří Kliber, CSc.	VŠB Technical University, Ostrava (Czech Republic)
Ing. Ľuboš Lopatka, PhD.	Zdravie, s r.o. (Slovakia)
Ing. Tibor Mikuš, PhD.	Trnava Self-governing Region (Slovakia)
Ing. Jozef Zelíska	HBPO Slovakia s r.o. Lozorno (Slovakia)

Secretary: doc. Ing. Roman Moravčík, PhD.

SCIENTIFIC BOARD (SINCE 01/11/2014)

Chair:
Prof. Dr. Ing. Jozef Peterka

Vice-chair
Prof. Ing. Miloš Čambál, CSc.

Internal members:

Prof. Ing. Maroš Soldán, PhD.	Prof. h.c. Prof. Ing. Karol Velíšek, CSc.
Prof. Ing. Peter Grgač, CSc.	Prof. Ing. Milan Marônek, CSc.
Prof. Ing. Jozef Janovec, DrSc.	doc. Ing. Roman Koleňák, PhD.
Prof. Ing. Ľubomír Čaplovič, PhD.	Dr. h.c. Prof. Dr. Ing. Oliver Moravčík
Prof. Ing. Peter Šugár, CSc.	Prof. Ing. Pavol Tanuška, PhD.
Prof. Ing. Peter Sakál, CSc.	Prof. Ing. Peter Jurči, PhD.
Prof. Ing. Alexander Čaus, DrSc.	Prof. Ing. Karol Balog, PhD.

External members:

Ing. Eva Kucháriková, CSc.	- HR&C Manager, Johns Manville Slovakia, a.s. Trnava
Visiting Prof. Ing. Peter Fodrek, PhD.	- CEO, PRVÁ ZVÁRAČSKÁ, a.s. Bratislava
Ing. Jaroslav Holeček, PhD.	- President, ZAPSR STU MTF Trnava
Prof. Dr. Ing. František Holešovský	- Dean, FVTM UJEP Ústí nad Labem, Czech Rep.
doc. Ing. Ivo Hlavatý, Ph.D.	- Dean, FS VŠB TU Ostrava - Poruba, Czech Rep.
Prof. Dr. Ing. Milan Sága	- Dean, SjF ŽU Žilina
Prof. Ing. Jozef Zajac, CSc.	- Dean, FVT Prešov TU Košice

ACADEMIC SENATE (UNTIL 21/10/2014)

Chair:	Prof. Ing. Miloš Čambál, CSc.
Chair of Academic Staff Chamber:	Prof. Ing. Karol Balog, PhD.
Chair of Student Chamber:	Ing. Michal Ondruška

ACADEMIC SENATE

Academic Staff Chamber

Prof. Ing. Karol Balog, PhD.	doc. Ing. Peter Pokorný, PhD.	**Student Chamber**
Prof. Ing. Miloš Čambál, CSc.	doc. Ing. Róbert Riedlmajer, PhD.	Ing. Michal Ondruška
doc. Ing. Ľubomír Čaplovič, PhD.	Prof. Ing. Jozef Sablik, CSc.	Bc. Martin Krivý
Ing. Michal Kebíšek, PhD.	doc. Ing. Pavol Tanuška, PhD.	Ing. Jozef Horváth
Ing. Marta Kučerová, PhD.	Prof. Ing. Koloman Ulrich, PhD.	Ing. Júlia Kurnátová
Prof. Ing. Milan Marônek, CSc.	Prof.h.c. Prof. Ing. Karol Velíšek, CSc.	Miroslav Fulier
doc. Ing. Milan Naď, CSc	doc. Mgr. Róbert Vrábeľ, PhD.	Bc. Miriama Kořínková
		Ľubomír Gabriš

ACADEMIC SENATE (since 22/10/2014)

Term of offce: 22/10/2014 – 31/10/2018

Chair:
doc. Ing. Milan Naď, CSc.

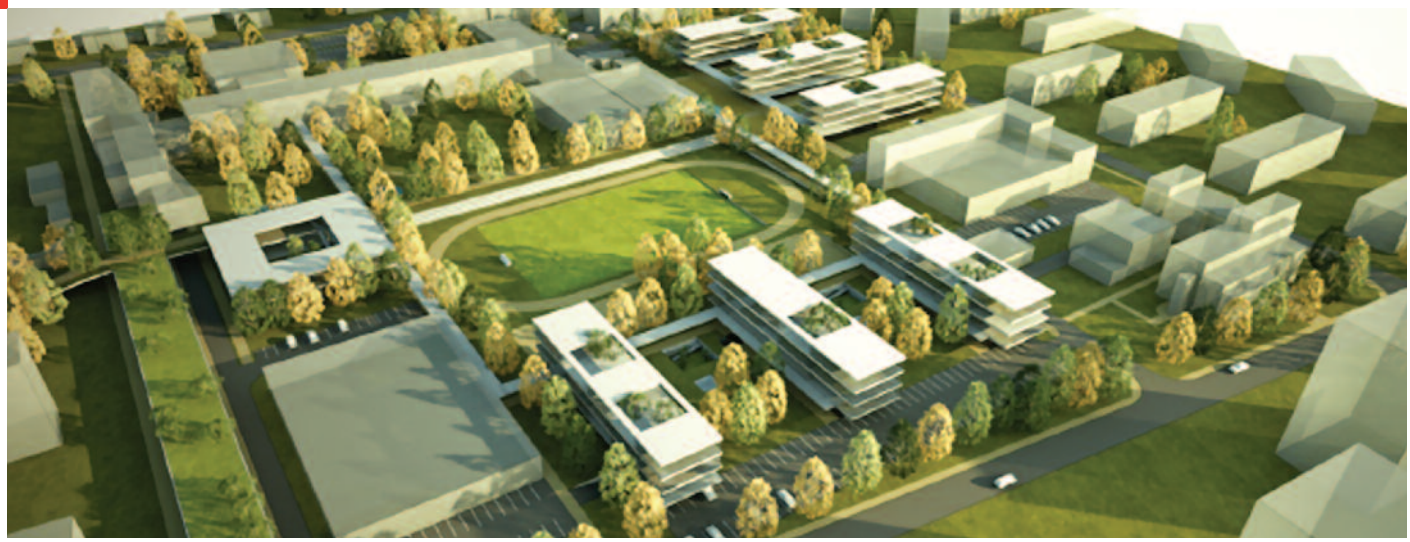
Chair of Academic Staff Chamber:
doc. Ing. Pavel Važan, PhD.

Chair of Student Chamber:
Ing. Mária Draxlerová

Academic Staff Chamber:

Prof. Ing. Karol Balog, PhD.	doc. Ing. Mária Hudáková, PhD.	**Student Chamber:**
doc. RNDr. Mária Behúlová, CSc.	doc. Ing. Martin Kusý, PhD.	Andrej Barcaj
doc. Mgr. Dagmar Cagáňová, PhD.	Prof. Ing. Pavol Tanuška, PhD.	Patrik Bystrický
Prof. Ing. Ľubomír Čaplovič, PhD.	doc. Ing. Štefan Václav, PhD.	Erik Herceg
doc. Ing. Andrea Chlpeková, PhD.	doc. Ing. Helena Vidová, PhD.	Bc. Jakub Jardek
doc. Ing. Augustín Görög, PhD.	doc. Mgr. Róbert Vrábeľ, PhD.	Bc. Veronika Laliová
		Bc. Dávid Tóth

DEVELOPMENT OF STU MTF IN 2014



The priorities for development in 2014 were as follows:

28/08
Signed Agreement for the next stage of the University Scientific Park construction -
Research Workplace of Automation and ICT Implementation in Production Processes and Systems with laboratories

10/09
Opening ceremony of the 2nd phase of the USP construction

Construction of the second phase of the University Scientific Park (USP) at STU MTF in Trnava was started on 10/09/2014 by laying the foundation stone for the buildings of the Research Workplace of Automation and ICT Implementation in Production Processes and Systems with laboratories. The objective of this project stage is to build a scientific workplace for the development of Management and Information Technologies and the related research and development of the information, communication and management structures in terms of the knowledge-based systems at all levels.






KEY ACTIVITIES OF THE FACULTY DEVELOPMENT IN 2014:

- increased storage capacity for students and teachers,
- installation of multimedia equipment in the Faculty teaching premises,
- complex reconstruction of the Internet wiring in the Student Hostel of Miloš Uher,
- implementation of the new ARL (Advanced Rapid Library) all-University Library System,
- creation of a central repository of digital objects in the field of publication activity and its acceptance,
- creation of navigation tools for verification of the publication environment quality, including a new library portal,
- indexation of "Vedecké práce MTF STU" (Research Papers of STU MTF) journal in 22 databases (including Inspec, Ebsco etc.),
- access to seven new worldwide databases,
- project preparation of future constructions,
- architectonic study of CAMBO.

The major development project in MTF is the "University Scientific Park CAMPUS STU MTF". In 2014, its construction proceeded by creating the building, the "Workplace of Materials Research with laboratories, including its connection to the Campus", and construction started on the new building, the "Research Workplace of Automation and ICT Implementation in Production Processes and Systems" (construction proceeds into 2015; estimated completion date: 2015).

20/01	Meeting with the STU Rector and vice-Rectors at MTF regarding the Calls for Horizon 2020 projects submission
28/08	Signed Agreement of the next stage of USP construction - Workplace of Automation and ICT Implementation in Production Processes and Systems with laboratories
10/09	Opening ceremony of the 2nd stage of USP construction
29/09-3/10	International Engineering Fair in Brno – participation of STU MTF
18/11	Presentation days of Companies
15/12	Establishment of Database for cooperation with practice (See the picture)

Other activities of the Faculty development in 2014:

Co-operation with practice

"Intensive cooperation with practice is indispensable for the Slovak University of Technology as a research university. Research greatly enhances the educational and research activities by reflecting the current need to provide unique solutions to the acute engineering problems, accelerate transfer of knowledge and provide funds. It contributes to the fulfilment of the Lisbon Strategy. The students and doctoral candidates involved in this significant activity along with the knowledgeable and respected top university employees can thus directly connect their projects with the research projects in industry. Forms of cooperation between the University and practice are of a different nature: there are real problems solved within the direct contract or order, research and innovation projects solved with partners from the industrial sector, the involvement of SMEs into international projects, student practice, mobility and internship in enterprises both at home and abroad, support for the development of small firms etc. Last year, vivid cooperation with practice was carried out in the University workplace, as documented by a number of contractual projects concluded with practice."(cit. Redhammer, R., STU Rector, 2011).

STU MTF is a research member of the "Knowledge Faculty for Economic Practice" project, ITMS 26110230113. Universities significantly contribute to the economic development of their region. An increased demand for knowledge is an incentive for streamlining the transfer of discoveries and outcomes of research and development into the economic sphere. The strategic objective of the research and development support for practice is the increased cooperation and communication among universities and presentation of their research and development areas for economic/business practice. Only such universities can be accepted in practice, since they share a relevant level of science with the wider community. They do not hesitate to maximise their potential for the creation of practice values and develop effective means for the initiation and integration of their activities and relations with the external environment. Acquisition of new partners through the project "Knowledge Faculty for Economic Practice" significantly supports the Faculty strategic objectives within the Long-term objective of the Faculty development, thus contributing to the general objective of active connection of academia and economic practice.

New partners of STU MTF – Agreements of cooperation signed in 2014 within the "Knowledge Faculty for Economic Practice" project

Partner	Country	City/Town
DTF Technology GmbH	Germany	Dresden
IS4U, s r.o.	Czech Republic	Brno
DVK Maschinenbau GmbH	Hungary	Budapest
NV Bekaert SA	Belgium	Zwevegem
Matador Industries, a.s.	Slovak Republic	Dubnica n./Váhom
Bizzcom, s r.o.	Slovak Republic	Trnava
Koval Systems, a.s.	Slovak Republic	Beluša
VIPO, a.s.	Slovak Republic	Partizánske
Dipex, spol. s r.o.	Slovak Republic	Sereď
Innov8 s.r.o.	Slovak Republic	Trnava
Kellys Bicycles, s r.o.	Slovak Republic	Veľké Orvište

Agreements of cooperation signed in 2014

Partner	Country	City/Town
Edenred Slovakia, s r.o.	Slovak Republic	Bratislava
Hella Slovakia Front Lighting, s r.o.	Slovak Republic	Kočovce
EG Research and Development Centre, s r.o	Slovak Republic	Trnava
Civic Association Samsung, Galanta	Slovak Republic	Galanta
Audia Plastics, s r. o.	Slovak Republic	Voderady
ŽP VVC, s r.o.	Slovak Republic	Podbrezová
POS Media Slovakia, s r.o.	Slovak Republic	Bratislava
Carl Zeiss spol., s r.o.	Czech Republic	Prague
Robert Bosch, s r.o.	Czech Republic	České Budějovice
College of Szolnok	Hungary	Szolnok
Kecskemet College	Hungary	Kecskemet

AWARDS IN 2014:

12/12/2014
The STU MTF Dean's Awards in the categories of:

COPYRIGHT CERTIFICATES AND PATENTS
doc. Ing. Pavol Božek, CSc.
doc. Ing. Peter Pokorný, PhD.

ENTREPRENEURIAL ACTIVITY
doc. Ing. Marián Hazlinger, PhD.

COMPANY PRESENTATIONS AT STU MTF IN 2014:

Name of presentation	Description of presentation
JOB DAY	On the 12th March 2014, STU MTF organised the 2nd annual "Job Day" with the aim to provide the future Faculty graduates/potential job applicants with information about vacancies within companies, and to prepare conditions for effective communication between students and employers.
Campus Week 2014	From the 30th June to the 3rd July, Campus Week, the 5th International Congress for universities under the title "Trends in Automation and Production" took place at the premises of the Festo Didactic Company in Denkendorf and Esslingen. The Congress was attended by Mr. T. Horák, the Festo spol. s.r.o. representative, and Prof.h.c. Prof. Ing. K. Velíšek, CSc., Prof. Ing. P. Tanuška, PhD. and Ing. M. Kopček, PhD., representatives from two MTF Institutes (UVSM and UIAM). The key topic of the contributions presented at the Congress was the concept of the 4th generation of the industrial revolution under the title Industrie 4.0.
Concept of the digital company and its application in automotive practice	The workshop introduced the concept of the "Digital Company" – a virtual image of real production and logistics via the processes and selected SW tools of the Tecnomatix® package in virtual conditions. This was followed by presentation of the project, its objectives, stages, the project team and its output. The project involved 15 students of all study degrees, who became a part of the project team.
ESAB 2014	A seminar within the cycle on welding and weldability, organised in cooperation with ESAB Slovakia s.r.o. and STU MTF. Guarantor of the event: UVTE.
Visit to the Robert Bosch Company, spol. s r. o. České Budějovice	UPIM initiated an excursion of students of UBEK and UPIM to Robert Bosch, spol. s r. o. České Budějovice on 28/03/2014.
Festival of Science 2014	The Festival of Science and Innovation 2014 was organised to support the official opening of the regional office of the European Alliance for Innovation (EAI) in Slovakia, as a result of cooperation between STU MTF and the European Alliance for Innovation (EAI) in Brussels.
Careers in VW Slovakia Summer school of mechatronic trainees 2014	27/11/2014 – a presentation delivered by employees of Volkswagen Slovakia a.s. Bratislava at STU MTF. On the 4th - 5th September 2014 – the "Summer school of mechatronic trainees" was organised by the Institutes of UIAM and UVSM in cooperation with FESTO spol. s.r.o. The event was attended by selected secondary school students who will represent the Slovak Republic in Euroskills, the international competition.
STU MTF at the International Engineering Fair 2014, Brno	Active participation of STU MTF at the International Engineering Fair in Brno on 29/09 -03/10/2014.
Night of Researchers 2014	The "FESTIVAL of SCIENCE, Night of Researchers in Slovakia" project was supported by the 7th framework programme for research and technology development of the European Commission. The "Night of Researchers" event is organised in 33 states of Europe with the aim to familiarise the wider public with science and researchers and their contribution to everyday life.
Work and Careers 2014	STU MTF participated in the event to provide prospective candidates with information about studies at the Faculty.
Presentation days of companies	On the 18/11/2014, STU MTF organised the "Presentation days of companies" event under the auspices of the National project of "Universities as motors of the knowledge society development" with the aim of matching university students with potential employers and to promote successful Faculty graduates and their careers.
JCMS and quality system in production process of plastics injection	On the 29/04/2014, a workshop, titled the "System of JCMS and quality in the production process of plastics injection" was delivered by representatives of Johnson Controls.
Special applications and DMG MORI Technologies	On the 03 – 04/12/2014, a seminar on Special applications and DMG MORI Technologies took place in the Excellence Centre of 5-axis machining at STU MTF.
TECHFORUM 2014	On 20-23/05/2014, TECHFORUM 2014, an International Engineering Fair in Nitra took place, with active participation by STU MTF. The fair presented output of the research and development workplaces of engineering universities and their collaboration with practice. Guarantor: OPOM.
Creative workshops 2014	An event guaranteed by UPIM during March 2014 within the project "MTF passes to green". During the presentation, the participants made products from waste materials.
STU MTF USP in the pages of the British Chamber of Commerce	Presentation of the research results, achievements and research potential of the Faculty is one of the key factors of attaining credibility and acknowledgement in the outer environment. Structured presentation and promotion can show the Faculty as an acknowledged partner for the area of research and development. Information on the Faculty research portfolio and its unique and distinctive features will be presented on the pages of the British Chamber of Commerce.

Regular meetings with experts from practice within the programme "Dialogues with practice" guaranteed by the Institute of Industrial Engineering and Management:

24/02
Dialogues with practice X. - Ing. Andrej VRÁBEL of SOVA Digital a.s. in Bratislava: " Utilisation of SW within the Digital Company concept – practical solutions"

31/03
Dialogues with practice XI. - Ing. Jan PRACHAŘ, PhD. of the European Polytechnic Institute, Institute of Economics and Management. Topic of the presentation: "Delivery conditions of INCOTERMS® in practice of international logistics"

RESEARCH INFRASTRUCTURE PROJECTS IN 2014

Institute/workplace	Operation programme	ITMS	Title of project	Time Period of Project
Faculty of Materials Science and Technology	Research	26250120053	A comprehensive modernisation of material and non-material (information and communication) educational infrastructure of the Bottova Campus	10/2012-06/2015
Faculty of Materials Science and Technology	Research	26110230116	The development of human resources in the field of research and development for the material research Workplace of the University Scientific Park CAMBO	10/2013-06/2015
Institute of Production Technologies + MIKON, s.r.o.	Research	26220220137	Industrial research into silent blocks for excessive load under extreme temperatures in the field of industrial application	11/2011-10/2015
Institute of Applied Informatics, Automation and Mathematics + Qintec, s.r.o. Trnava	Research	26220220159	Research into monitoring and assessing the non-standard states in the vicinity of a nuclear power plant	04/2012-09/2014
Institute of Industrial Engineering, Management and Quality	Education	26110230115	Centre for the development of competencies for the field of Industrial Engineering and Management	10/2013-09/2015
Division of Knowledge Management	Education	26110230113	Knowledge-based Faculty for economic practice	10/2013-09/2015
Research Centre of Progressive Technologies	Research	26210120017	Centre for research and development in the field of the electron-beam and progressive arc technologies of welding, cladding and surface-finishing (WeldCenter)	10/2012-06/2015
Institute of Production Technologies	Research	26210120020	Technical infrastructure of research and development for the field of the contact and contact-free methods of measurement	10/2012-06/2015
Faculty of Materials Science and Technology	Research	26220220179	University Scientific Park „CAMPUS STU MTF" – CAMBO	03/2013-06/2015
Faculty of Materials Science and Technology and Faculty of Civil Engineering Bratislava	Research	26250120070	Complex modernisation of the educational, material, information and communication infrastructure of the CAMPUS Bottova II, and reconstruction of the Kočovce training centre	04/2014-09/2015

This part of the Annual Report 2014 was verified by prof. Dr. Ing. Jozef Peterka and doc. Ing. Peter Pokorný, PhD.

ACCREDITATION 2014

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 2014, the Faculty provided 9 Bachelor study programmes, 11 Master study programmes, and 8 Doctoral study programmes. The Bachelor and Master study programmes were provided in full time form, the Doctoral programmes were offered in both full-time and part-time study forms.

ACCREDITED STUDY PROGRAMMES AT THE FACULTY

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

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

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

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.

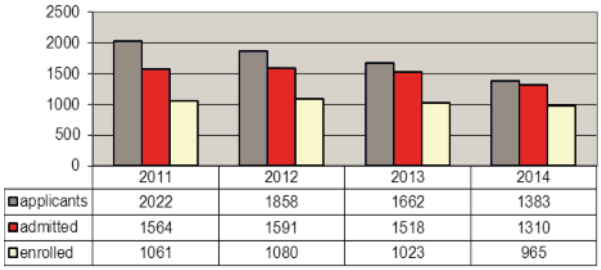
Degree 2:
Master's study, accomplished by gaining the academic title of engineer – "Ing." (corresponding to MSc.)

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.

The above-mentioned programmes at Degree levels 1 and 2 can be studied in a full-time form; the Doctoral study (Degree level 3) programmes are provided in both full-time and part-time forms.

APPLICATIONS, ADMITTANCE AND ENROLMENTS FOR STUDY AT THE FACULTY

The level of interest in study at the Faculty within individual degrees is quite stable. A decrease in the number of the 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 the decreasing demographic curve and the increasing number of new universities and colleges in the Slovak Republic, on the other hand.

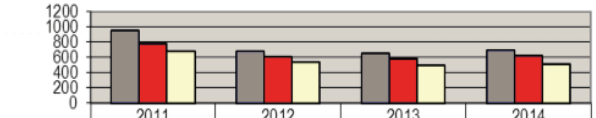


	2011	2012	2013	2014
applicants	2022	1858	1662	1383
admitted	1564	1591	1518	1310
enrolled	1061	1080	1023	965

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

ADMISSION PROCEDURE VARIES ACCORDING TO THE DEGREE

The admission procedure for the Bachelor's degree is based on the applicant's secondary school results, i.e. there is no entrance examination. An interest in the area of 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 the overall study achievements of the Bachelor's graduate.



	2011	2012	2013	2014
applicants	961	689	659	692
admitted	784	610	588	627
enrolled	685	537	500	517

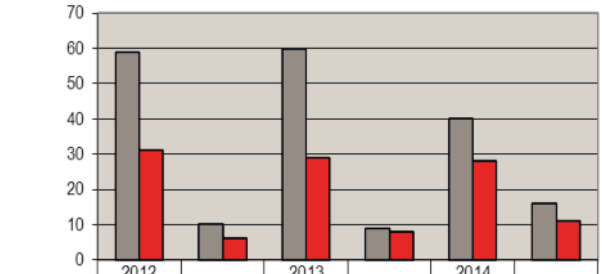
Graph No. 2
Number of Master's degree candidates (applicants, admitted, enrolled) in the last four years

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.

Table. 1
Master's degree candidates: graduates of STU MTF and other universities in 2014/2015

Applicants	MTF graduates	591
	From other universities 101	
	Total	692
Enrolled	MTF graduates	448
	From other universities 69	
	Total	517

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).

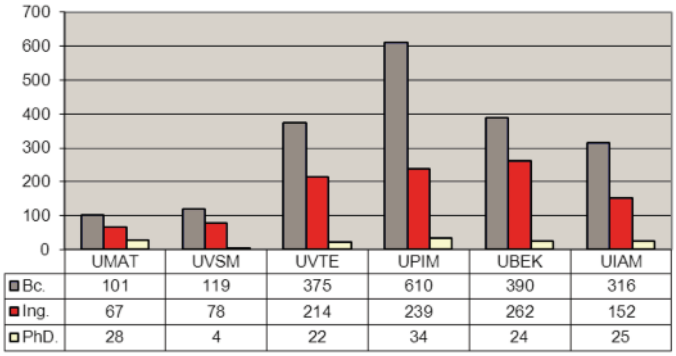


	2012 Full-time	Part-time	2013 Full-time	Part-time	2014 Full-time	Part-time
applicants	59	10	60	9	40	16
enrolled	31	6	29	8	28	11

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

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.



	UMAT	UVSM	UVTE	UPIM	UBEK	UIAM
Bc.	101	119	375	610	390	316
Ing.	67	78	214	239	262	152
PhD.	28	4	22	34	24	25

Graph No. 4
Number of students by degree level at particular institutes 31.10.2014

Abbreviations used:

UMAT - Institute of Materials Science
UVSM - Institute of Production systems and Applied Mechanics
UVTE - Institute of Production Technologies
UPIM - Institute of Industrial Engineering and Management
UBEK - Institute of Safety, Environment and Quality
UIAM - Institute of Applied Informatics, Automation and Mathematics

Study conditions

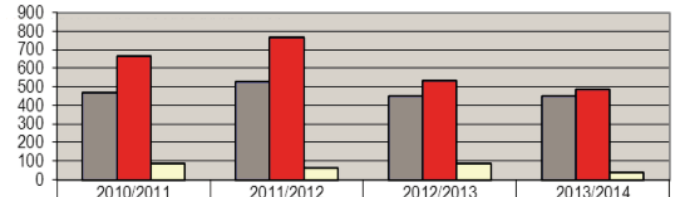
Regarding the premises and administration, the study conditions at the Faculty can be considered favourable.
Access to textbooks has been improved by implementing the model of electronic textbooks available to all the Faculty students free of charge. To meet the student's requirements, Saturday office hours in the Registrar's Office and the Academic Library were introduced. As for social policy, significant is the study at the detached workplaces in Komárno and Dubnica nad Váhom (the first year of bachelor studies).

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 at the International Doctoral Seminar, an annual event organised 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.

QUALITY OF EDUCATION AND EMPLOYABILITY OF GRADUATES

Education efficiency and quality can be assessed by various criteria and parameters, such as the placement rate of graduates and the unemployment rate regularly announced by the Ministry of Labour, Social Affairs and Family, SR. The fact that STU ranks among the universities with the lowest unemployment rate is justified by the educational quality and interest in social practice of the Faculty graduates.



	2010/2011	2011/2012	2012/2013	2013/2014
BC	466	526	449	450
ING	666	766	533	488
PHD	88	61	84	40

Graph No. 5
Number of Faculty graduates in the last four years

The aim of the educational process is to train graduates for their future profession. Its efficiency is measured by various methods, the most important of which is the method of feedback mapping the student's opinions regarding the study contents, activities of the educational process implementation, study environment and teaching strategies. Besides these tools of educational quality improvement, the Faculty carries out a survey regarding student satisfaction with the aim to identify weaknesses in the education process, the teaching strategies, as well as the administration and organisation.
In accordance with the law on Universities No. 131/2002 Coll., the STU MTF students have a chance to participate in a survey via a questionnaire available on the Faculty website. The questionnaire is comprised of the following areas: process and organisation of the study, the quality and professional behaviour of teachers, the quality of the teaching process, accommodation and other areas.
The electronic questionnaire evaluating the level of education from the perspective of students, during the academic year 2012/13 was responded to by 463 students of all study degrees. The Faculty management deals seriously with the student suggestions from the questionnaire and informs the students and teachers on possible solutions or improvements.

SOCIAL MATTERS

Accommodation and board for students are provided in the Student Hostel of M. Uher and the adjacent cafeteria and snack bars. Students appreciate the relatively high standard of comfort including free internet connection, as well as the availability of sports facilities such as a fitness centre, gym, indoor swimming pool and tennis courts, directly on the campus.
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, the length of a training unit, the arrangement 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.
As amended by law, the social system includes both enforceable and non-enforceable scholarships provided within the framework defined by the Act on Universities or the internal University and Faculty legislations.

STUDENT AWARDS IN 2014

04/03/2014
Natália PREKOPOVÁ, Winter Universiade 2013 in Trentino (Italy) in individual competitions for 15 km, 1st place.

10/04/2014
Radovan HANKOVSKÝ, Slovak Academic Championships in Žilina, 3rd place in the category "kumite men" - 67 kg.

10/04/2014
Jakub KONIAR, European Championships in snooker (29/03/-10/04/2014), 2nd place.

10/04/2014, 29/04/2014 and 30/04/2014
Sport competitions "STU Rector's Cup" the STU MTF students succeeded in the following categories:

SWIMMING:	1st place: JANSKÁ Miroslava: 1x 1st place, 2x 2/place, 2x 3/place, JANÍČKOVÁ Miroslava: 1x 2nd place, BAHNOVÁ Elena: 4x 5th place, ULEHLA Filip: 1x 1st place, 1x 2nd place, DUTKA Vladimír: 1x 3 rd place, LUKAČOVIČ Andrej: 1x 5th place, 1x 6th place, MEJIA Antonio: 1x 7th place
FOOTBALL:	1st place: NETSCH Lukáš, KARAS Dávid, KARAS Martin, GALBA Juraj, DVORSKÝ Peter, CVEČKA Tomáš, HERDA Jakub, ŽÁČEK Michal, BLAŽEK Jakub, HRUBŠA Dávid, GONDÁR Andrej, LÁNIK Filip, ŠEBEŇ Peter, ĎURIŠ Jakub.
TABLE TENNIS:	TARIŠKOVÁ Zuzana: 3rd place, Ján JUROŠ, Marek FARBIAK, Richard BEBLAVÝ, Matej MARKUS.
VOLLEYBALL:	3rd place: Petra FOLTÍNOVÁ, Kristína ŠATUROVÁ, Michaela ŽILÍKOVÁ, Michaela FILIPOVÁ, Maria KRAJČOVIČOVÁ, Viktória MICHELČÍKOVÁ, Katarína JASSUŠOVÁ, 5th place: Juraj KÁKOŠ, Timotej SITÁR, Tomáš HLÍSTA, Martin GULABA, Michal MAGDOLEN, Michal KOVÁČ, Matúš DEMIAN, Tomáš KICSINDI.
TENNIS:	KUBICA Peter: 3rd place, VINCEOVÁ Petra: 3rd place, LUKAČOVIČ Michal, HOLOŠ Peter, JURÁŇ Peter.
BASKETBALL:	6th place: Matej HRUŠOVSKÝ, Peter NAGY, Tomáš SLANINKA, Antonio MEJIA, Jakub PAVLAČKA, Peter ONDRUŠKA, Alžbeta SPIŠÁKOVÁ.
FLOORBALL:	4th place: HLADÍK Marián, CÁK Dominik, PETRÍK Peter, ŠUPÍK Marián, KRÍDL Radko, KOVALOVSKÝ Nikolas, MAGDOLEN Tomáš, MIŠUTA Andrej, HLAVÁČ Marek, FÁBIK František, HANO Patrik, MAŠEK Michal, ŠIŠOLÁK Karol.
HOCKEY:	4th place: Patrik HANO, Lubomír ŽAŤKO, Mikuláš VIZVÁRY, Martin PONIŠT, Pavel PALČEK, Ján BARTEK, Tomáš DRGOŇ, Ján GUZLEJ, Michal KOLLÁR, Juraj CHROMEK, Rado HANKOVSKÝ, Tomáš NÁDASKÝ, Martin MICHALKA, Adrián NESTEŠ, Marek HURAJT.
UNIVERSITY REGATA:	2nd place: ŽILIKOVÁ Michaela, PILCH Peter, JUROŠ Ján, ĽUBUŠKÝ Peter, FAZEKAŠ Peter, 3rd place: ONDRUŠKA Michal, KURNÁTOVÁ Júlia, HURAJT Marek, VLAŠEK Matúš.

10/05/2014
Jakub KONIAR, SR Championships in snooker (3rd- 4th May 2014) Champion of the Slovak Republic.

13/05/2014
Vladimír KRAJČO, 2nd place, 10th year of the International Student Research Conference 2014 in the Master's category in Zlín, Czech Republic.

13/05/2014
Ján JUROŠ, 2nd place, 55th year of the International Student Research Conference of the Faculty of Wood Science and Technology in Zvolen.

03/06/2014
Miroslava JÁNSKA, Slovak Academic Championships, 3rd place in 100 meters/backstroke and 2x1st place in the Trnava Relay.

17/06/2014
Ľubomír BEŇO, 2nd place, Universiade in Kazan 2013, canoe regatta.

27/06/2014
Filip PRAJ, 6th place in the category of juniors, European Championships in shotgun in Szarlospuszta, Hungary (16 - 27/06/2014).

02/07/2014
Peter ELIÁŠ, 2nd place in the competition for the best Bachelor's and Master's theses within engineering universities in Slovakia.

08/07/2014
Awarding students 2013/2014

Baďura Branislav, Ing
Bajcar Marcel, Ing.
Berčík Peter, Ing.
Danek Maroš, Ing.
Drábik Marián, Ing.
Drhová Jana, Ing.
Gondek Ján, Ing.
Hlavanda Patrik, Ing.
Hnilica Patrik, Ing.
Holík Matej, Ing.
Kabát Ľubomír, Ing.
Konečná Lucia, Ing.
Kováč Vladimír, Ing.
Kozáková Monika, Ing.
Kružliaková Viera, Ing.
Lašček Lucia, Ing. Mgr.
Lipovský Marek, Ing.
Marcinek Ján, Ing.
Nagy Máté, Ing.
Polák Andrej, Ing.
Svátek Jaroslav, Ing.
Štefula Dominik, Ing.
Šurinová Radka, Ing.
Tadanai Ondrej, Ing.
Vrábľová Martina, Ing.

15/07/2014
Peter ELIÁŠ, 2nd place in the all-Slovakia competition of SOVA Digital and Siemens Co. "The best Master thesis" focused on the information technologies application in the field of mechanical engineering.

13/10/2014
Finals of the "The Best Student Project 2014" competition:

1st place: Vladimír KRAJČO: Design of an effective assembly process in the assembly workplace VS 20 via MTM UAS in ZF Boge Elastmetall Slovakia Co. in Trnava, a.s.

2nd place: Filip GALGÓCI: Design of the layout modification of the sales warehouse in the division of the clutch and dual-mass flywheels production of ZF SACHS Slovakia, a. s.

3rd place: Ján JUROŠ: Proposal of a more effective process of exchanging dies of vulcanising presses by the SMED (Single Minute Exchange of Dies) method in ZF Boge Elastmetall Slovakia, a.s., Trnava.

Special prize for the best thesis in the field of Quality Management- Marián DRÁBIK: Project of increasing the efficiency of LPA system via Kamishibai in Martinrea Slovakia Fluid Systems, s.r.o.,

Special prize from a competition organiser - Matúš ZORIČÁK: Analysis of quality costs in a company and their optimisation.

22/10/2014
Dean's honourable mention for excellence in the final thesis – list of students

Adámková Miroslava, Bc.
Benešová Jaroslava, Bc.
Galgóci Filip, Bc.
Haško Milan, Bc.
Jánošíková Lenka, Bc.
Jurina František, Bc.
Keseli Tomáš, Bc.
Laliová Veronika, Bc.
Lehocký Jakub, Bc.
Martinkovičová Jana, Bc.
Miklóš Andrej, Bc.
Ordzovenská Štefánia, Bc.
Országh Miroslav, Bc.
Patková Simona, Bc.
Raguľová Veronika, Bc.
Repová Dominika, Bc.
Sýkorová Janka, Bc.
Šimon Patrik, Bc.
Šimončičová Stanislava, Bc.
Šramo Martin, Bc.
Tánczos Marián, Bc.
Vojtuš Tomáš, Bc.

22/10/2014
Dean's honourable mention for excellence in the final thesis in the academic year 2012/2013

Boledovič Martin, Bc.
Frnčík Martin, Bc.
Galba Juraj, Bc.
Haršányová Petra, Bc.
Hetteš Roman, Bc.
Chovancová Erika, Bc.
Jesenský Vladimír, Bc.
Juhászová Petra, Bc.
Karolová Miroslava, Bc.
Kondéová Iveta, Bc.
Korecová Eva, Bc.
Lackovičová Daniela, Bc.
Magdolen Michal, Bc.
Môciková Dominika, Bc.
Nádaský Tomáš, Bc.
Pažitný Peter, Bc.
Poništ Tomáš, Bc.
Sudovská Dominika, Bc.
Szewczyk Tomáš, Bc.
Urcikán Jozef, Bc.
Valo Andrej, Bc.

05/11/2014
Gabriel GAŠPAR-1st place in the competition of innovative ideas RESEARCH STAR

18/11/2014
"Student of the Year 2014" – for STU MTF:
Sarah MÜLLEROVÁ – the best student at Bachelor's degree level.
Monika HORNÁČKOVÁ- the best student at Master's degree level.
Marek ADAMECH- the best student at Doctoral degree level.
Jaroslav MRÁZ- extraordinary achievement in the field of research and development.
Miroslava JANSKÁ- outstanding STU representative in sport.

09 – 11/12/ 2014
Students awarded in the competitions within the STU MTF "Sports Week" in the following categories:
TABLE TENNIS
Women -1st place Lucia DANIŠOVÁ, 2nd place Katarína JASSUŠOVÁ, 3rd place Anna SPODNIAKOVÁ.
Men – 1st place Tomáš LUKÁČ, 2nd place Marek VAJDA, 3rd place Richard BEBLAVÝ.
SWIMMING
1st place Miroslava JANSKÁ, 2nd place Andrej LUKAČOVIČ, 3rd place Tomáš ZELENAY.
FOOTBALL: 1st place ČIERNA RUKA, 2nd place BARONI, 3rd place VLČÁCI.
VOLLEYBAL: 1st place TANKISTI, 2nd place ISHIKAWA TEAM, 3rd place OOO TEAM.

12/12/2014

STU MTF Dean's Award:

The best student publication activity: Pavel BÍLEK, Marcel KURACINA, Martin NEŠTICKÝ.

The best student at Bachelor's degree level: Michal SLEZÁK, Martin MUŽILA, Martina KAMENSKÁ, Dávid SOÓKY, Monika ZÁMEČNÍKOVÁ, Matúš MARTINEC, Katarína STANKOVÁ, Jakub GAŽO, Ervín HILLER.

The best student at Master's degree level: Tomáš VÁGOVIČ, Silvester GRÍGEL, Dávid KYSELICA, Martin KRUPA, Milan LIGO, Tomáš FÁBIK, Petra HARŠÁNYOVÁ, Pavlína KOČÍŠKOVÁ, Jozef ŠILD.

Student extracurricular activities for the Faculty benefit: Michal ONDRUŠKA.

The aim of the SR National Competition for Quality 2013, held on 11th November 2013, was to "award the best publication in the field of work quality, production and life" to gain and disseminate new knowledge in the field of work quality, production and life in Slovakia for sustainable improvement and leading innovations. **Petra Kosnáčová**, an STU MTF student, was awarded in the category of the best Master thesis. Her thesis was entitled the "Application of statistical methods in process improvement". Diplomas were granted by Tomáš Malatinský, SR Minister of Economy and Jozef Mihok, the chair of the SR Office for standardisation, metrology and testing.
Bc. Krajčo Vladimír, an STU MTF student won 2nd place in the 10th year of the ŠVOČ 2014 International Conference, Master's category, organised at the Faculty of Economics and Management, Tomáš Baťa University in Zlín, Czech Republic. Bc. Juroš Ján, an STU MTF student also won 2nd place in the 55th year of the International Student Research Conference at the Faculty of TU Wood Science and Technology in Zvolen.
Jaroslav Mráz, CEO of IGEEK Co. and an STU MTF student, was awarded the Prize of the Minister of Education in the all-Slovakia Student Entrepreneurial Competition, and his IT enterprise launched several iPhone and Android applications successful also abroad.
Jakub Koniar – 2nd year STU MTF Bachelor student, a snooker player, became the SR Master in the SR Snooker Championships on the 3rd – 4th May 2014. Besides, he succeeded in the European Snooker Championships in Northern Cyprus on 29/03 - 10/04/2014, where he won 2nd place in game No. 8, thus gaining the historic first medal for Slovakia in the category.
Radovan HANKOVSKÝ, an STU MTF student, participated in the Slovak Academic Championships in Žilina, winning 3rd place in the category "kumite men" - 67 kg.
Natália PREKOPOVÁ, an STU MTF student, participated in the Winter Universiade 2013 in Trentino, Italy, winning 1st place in the individual competition for 15 km.

The Faculty Dean awarded extraordinary scholarships for student mobility in compliance with VP No. 8/2013 of the STU Scholarship Code and VP No. 2/2014 of the STU MTF Scholarship Code to the following doctoral and master students:

Beňák Filip, Bc.
Greguš Róbert, Bc.
Niklová Petra, Bc.
Lukáčová Simona, Bc.
Mikulášková Justína, Bc.
Petráš Rastislav, Mgr.
Púčiková Lenka, Ing.
Woolliscroft Paul, MSc.
Neštický Martin, Ing.
Samardžiová Michaela, Ing.

This part of the Annual Report 2014 was verified by doc. Ing. Peter Schreiber, PhD.

RESEARCH AND INTERNATIONAL RELATIONS

RESEARCH AWARDS IN 2014:

04/06/2014
"Teach me how to understand science" competition – contribution "How a rainbow emerges" by the authors Ing. Jakub Franík, Ing. Peter Cuninka, Ing. Andrea PETERKOVÁ (doctoral student in UIAM MTF), 4th place.

Summer 2014
The best poster in the ISMANAM Conference in Cancun (Mexico): Eva Babalová and Mária Behúlová

02/09/2014
The Institute of Sustainable Social Responsibility of Czech and Slovak Republics o.p.s., granted the 2nd place to the STU MTF Institute of Industrial Engineering and Management in the competition "Sustainable Social Responsibility of the Czech and Slovak Republics in 2013". The competing team was led by Prof. Ing. Peter Sakál, CSc.

17/09/2014
The Dean of the TU Faculty of Mechanical Engineering in Košice awarded a platinum medal to Dr.h.c. Prof. Dr. Ing. Oliver MORAVČÍK for successful cooperation and support.

14/ 10/2014
STU Rector Prof. Ing. Róbert Redhammer, PhD. presented the award for the most successful project of young researchers in STU MTF to Ing. Eva Babalová, PhD.

02/10/2014
The TTSK award was presented to Dr.h.c. Prof. Dr. Ing. Oliver MORAVČÍK for outstanding contribution to science and educational development.

5/12/2014
The STU Rector's Award of "Professors and Scientists of the year 2014"
Dr. h. c. Prof. Dr. Ing. Oliver MORAVČÍK – for outstanding achievements in education, research and development activities in the field of automation and applied informatics.
Mgr. Marián PALCUT, PhD. – for a complex study of degradation processes in new and perspective materials.

20/11/2014
Award of the SR Office for Standardisation, Metrology and Testing "National Award of the Slovak Republic for Quality 2014 – for life-long contribution in the field of quality" to Prof. Ing. Alexander LINCZÉNYI, CSc. – STU MTF Professor Emeritus.

12/12/2014
The STU MTF Dean's Award in the following categories:

BEST DISSERTATION THESIS
Ing. Alica Bartošová, PhD.
Ing. Delgado Sobrino Daynier Rolando, PhD.
Ing. Michaela Samardžiová, PhD.

BEST HABILITATION THESIS
doc. Ing. Jana Šugárová, PhD.

CONTRIBUTION IN THE FIELD OF THE FACULTY RESEARCH AND ACCREDITATION
Prof. Ing. Alexander Čaus, DrSc.
Prof. Ing. Jozef Janovec, DrSc.
Ing. Jozef Martinka, PhD.
doc. Mgr. Róbert Vrábeľ, PhD.
RNDr. Marcel Abas, PhD.
doc. Ing. Mária Dománková , PhD.
doc. Ing. Roman Koleňák , PhD.
RNDr. Maroš Sirotiak , PhD.

COPYRIGHT CERTIFICATES AND PATENTS
doc. Ing. Pavol Božek, CSc.
doc. Ing. Peter Pokorný, PhD.

ENTREPRENEURIAL ACTIVITY
doc. Ing. Marián Hazlinger, PhD.

NEW DOCTORS HONORIS CAUSA, PROFESSORS AND ASSOCIATE PROFESSORS IN 2014

Doctor honoris causa (Dr.h.c.)

Dr. h. c. Ing. Peter Doll
- Doctor honoris causa (25/11/2014)

Professors

Prof. Ing. Pavol Tanuška, PhD.
- Automation (26/05/2014)

Prof. Ing. Ľubomír Čaplovič, CSc.
- Materials (19/11/2014)

Associate Professors

doc. Ing. Ladislav Morovič, PhD.
- Machine Technologies and Materials
(02/07/2014)

doc. Ing. Jana Šugárová, PhD.
- Machine Technologies and Materials
(02/07/2014)

doc. Ing. Daniel Švrček, PhD.
- Production Systems
(02/07/2014)

doc. Ing. Michal Kopček, PhD.
- Automation (10/12/2014)

doc. Ing. Richard Kuracina, PhD.
- Occupational Health and Safety
(10/12/2014)

RESEARCH ACTIVITIES IN 2014:

20/01	Meeting at MTF with the STU Rector and vice-rectors regarding the Call for Horizon 2020 projects
12/02	Opening ceremony of the Laboratory of Flexible Production Systems with robotised operation for the conditions of drawing-free production
20/03	Student Research Conference
24/04	Doctoral Conference
25/04-26/04	Festival of Science - European Forum for Innovation 2014
20/05-23/05	Presentation of STU MTF at the TECHFORUM 2014 Fair
18/07	Film festival at STU MTF
28/08	Signed Agreement on the next stage of the USP construction - Research workplace of Automation and ICT Implementation in Production Processes and Systems with laboratories
04/09-05/09	Summer School of Young Mechatronic Trainees
10/09	Opening ceremony of the 2nd phase of UVP construction
26/09	Night of researchers – participation of STU MTF
29/09-03/10	International Engineering Fair in Brno - participation of STU MTF

OVERVIEW OF CONFERENCES ORGANISED AT STU MTF IN 2014:

08-10/02	9th project meeting, excursion and final conference within the project of "AUTOCLUSTERS"
10/04-11/04	ECIC 2014 - The 6th European Conference on Intellectual Capital
24/04	Doctoral Conference
19/05-21/05	International Doctoral Seminar Zielona Góra 2014
26/05	ESAB 2014
03/09-06/09	Forming 2014
25/11	Seminar on intellectual property in STU
03-04/12	Seminar "Special applications and technologies DMG MORI".

RESEARCH FOCUS

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 activity in the field of science and technology once a year.

The scientific and research activity of STU MTF 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 and the 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:

Research area	**Evaluation**
Mechanical Engineering	A
Metallurgy and Materials	A
Information Sciences, Automation and Telecommunication	B
Engineering and Technology	B+

RESEARCH ACTIVITIES

In 2014, research projects under the VEGA, KEGA, APVV and other programmes were conducted at the Faculty. The number of projects in 2014 from the particular agencies, grant schemes and contractual research are as follows:

	Number
VEGA projects (Scientific Grant Agency)	25
KEGA projects (Cultural and Educational Grant Agency)	11
APVV (Slovak Research and Development Agency)	6
7th Framework Programme	1
Other foreign projects	2

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

Foreign Partner	Country	City/Town
Helmholtz-Zentrum Dresden-Rossendorf	Germany	Dresden-Rossendorf
Technical University of Brandenburg	Germany	Cottbus
Leibniz-Institute for Solid State and Materials Research Dresden	Germany	Dresden
Faculty of Machining, University in Ljubljana	Slovenia	Ljubljana
The National Research University of Information Technologies, Mechanics and Optics, Saing-Petersburg	Russia	Saint-Petersburg
Institute of Energy in Moscow	Russia	Moscow
Buehler GmbH	Germany	Düsseldorf
Ukrainian Academy of Engineering and Pedagogy	Ukraine	Charkov
Faculty of Applied Informatics and Robotechnology, UGATU UFA	Russia	Ufa
Faculty of Economics, Management and Finances UGATU UFA	Russia	Ufa
National Institute of R & D for Materials Physics	Romania	Bucharest
Faculty of Physics, University of Bucharest	Romania	Bucharest
Faculty of Organisation and Informatics Varaždin, University of Zagreb	Croatia	Zagreb
Bekaert, Zwevegem	Belgium	Zwevegem
Faculty of Machine Building, Technical University of Cluj-Napoca	Romania	Cluj-Napoca
Institute of Technology	Poland	Radoma
Innovation Centre for Diagnostics and the Application of Materials, Czech Technical University Prague	Czech Republic	Prague
University of Miskolc	Hungary	Miskolc
Institute for Systematic Coaching and Organisation Advisory	Germany	Berlin
Faculty of Economics and Management of University of Zielona Góra	Poland	Zielona Góra
Faculty for Management	Serbia	Novi Sad
Faculty of Information Technologies and Telecommunication of North-Caucasian State Technical University	Russia	Stavropol
Faculty of Mining and Metallurgical Engineering of Amirkabir University of Technology	Islamic Republic of Iran	Teheran
Izhevsk State Technical University of Kalashnikov	Russia	Izhevsk
Hochschule Mannheim University of Applied Sciences	Germany	Mannheim
Vocational Higher Education School in Sulechów	Poland	Sulechów
Institution of Education, Gomel State University of Francysk Skarina	Belarus	Gomel

VISITS OF FOREIGN GUESTS TO STU MTF IN 2014:

21/03/2014 Visit of a foreign delegation
On 21/03/2014, Vice-dean Prof. Dr. Ing. Jozef Peterka and Director of the Institute of Production Technologies, Prof. Ing. Koloman Ulrich, PhD. welcomed the delegation of the Faculty of Materials Sciences and Engineering, University in Miskolc. The delegation was led by Dean, Prof. Dr. Zoltán Gácsi, DSc. Negotiations concerned the topics of cooperation and preparation of joint projects within Horizon 2020.

09/04/2014 Meeting of the STU MTF Dean with the Vice-dean of the University of Tomáš Baťa in Zlín
On 09/04/2014, The Faculty Dean welcomed doc.Ing. David Tuček, PhD., Vice-dean of the University of Tomáš Baťa in Zlín. The meeting was attended by the Directors of the STU MTF Institutes, Prof.h.c. Prof. Ing. Karol Velíšek, CSc., Prof. Ing. Karol Balog, PhD. and Prof. Ing. Miloš Čambál, CSc. After presentations of both universities at the beginning of the meeting, the guest visited the STU MTF laboratories with the aim of agreeing future collaboration.

10/04/2014 Visit of the FVTM Dean, University of Jan Evangelista Purkyně in Ústí nad Labem
On 10/04/2014, the Faculty was visited by Prof. Dr. Ing. František Holešovský, Dean of the Faculty of Production Technologies and Management, University of J. E. Purkyně in Ústí nad Labem. Negotiations with the STU MTF Vice-dean, Prof. Dr. Ing. Jozef Peterka, CSc., took place concerning future cooperation in the field of pedagogy and joint research within the Horizon 2020 call.

16/05/2014 Visit from Miba Steeltec Co., Vráble
On 16/05/2014, a workshop regarding the topic "Case studies in Quality Management" was organised in the Heavy Laboratories as part of the successful cooperation between STU MTF and Miba Steeltec Co. Vráble. The workshop was attended by representatives of Miba Steeltec Co., Radovan Martišovič, Vladimír Jánošík and Milan Ďurč.

11/07/2014 Visit from Szolnok University College
On 11/07/2014, the Faculty was visited by Rector Dr. Imre Túróczi and Vice-rector Dr. Márta Kóródi, PhD. of Szolnok University College. The delegation was welcomed by Prof. Ing. Peter Grgač, CSc., Vice-dean for science, research and international relations, and doc. Ing. Helena Vidová, PhD., Vice-dean for PR and internal affairs. The negotiations were led by Prof. Ing. Miloš Čambál, CSc., doc. Ing. Ladislav Morovič, PhD., Ing. Peter Szabó, PhD. and Ing. Juraj Czifra, PhD. The meeting drafted the trends in cooperation in the fields of pedagogy, research and development, and publication, as well as the mobility of students and teachers of both institutions.

STUDENT EXCHANGES

STU MTF students participate in exchange programmes of short-term and also long-term scholarships. In 2014, the Faculty had 13 agreements in the Erasmus programme. The dominant Erasmus partners are the institutions in Poland (4 agreements), Germany (2 agreements), Czech Republic (2 agreements).

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 six professional international organisations. Employees of the faculty are active in different Slovak (individual memberships) and also international organisations (individual memberships) in different positions, from members to chairs, vice-chairs and members of boards.

Membership in 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 in 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

APPROVED RIGHTS TO PROVIDE HABILITATIONS AND GRANT ACADEMIC TITLES

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 the 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 Machines
5.2.52	Industrial Engineering
8.3.5	Occupational Health and Safety

This part of Annual Report 2014 was verified by Prof. Ing. Peter Grgač, PhD., Prof. Ing. Miloš Čambál, CSc.

INTERNAL RELATIONS

AWARDS IN 2014

12/12/2014
STU MTF Dean's awards in the categories:

LONG-SERVICES AWARDS FOR MTF EMPLOYEES
prof. Ing. Miloš Čambál, PhD.
doc. Ing. Marián Hazlinger, PhD.
doc. Ing. Vladimír Labaš, PhD.
PaedDr. Elena Lukačovičová, PhD.
doc. Ing. Mária Kapustová, PhD.
doc. Ing. Maroš Martinkovič, PhD.

INITIATIVE AND PROFESSIONAL APPROACH
Michal Bohunický

EXTRAORDINARY APPROACH TO THE PROMOTION OF THE FACULTY
Ing. Štefan Svetský, PhD.

LIST OF THE MOST IMPORTANT FACULTY EVENTS IN 2014

Month	Date	Action
January	16/01/2014	STU MTF New Year`s Meeting
	20/01/2014	Meeting at MTF with the STU Rector and vice-rectors regarding the Call for Horizon 2020 projects
	29/01/2014	Open Day

February	03 -07/02/2014	Doctoral Week
	04/02/2014	World Cancer Day at STU MTF - lecture and presentations in all Faculty pavilions
	12/02/2014	Opening ceremony of the Laboratory of Flexible Production Systems with robotised operation for the conditions of drawing-free production
	24/02/2014	Dialogues with practice X. - Ing. Andrej VRÁBEL (SOVA Digital a.s. in Bratislava: "Utilising SW within the concept of the "Digital Company – practical solutions"

March	12/03/2014	JOB DAY
	20/03/2014	Student Research Conference
	24 -28/03/2014	STU MTF Book Week
	31/03/2014	Dialogues with practice XI. - Ing. Jan PRACHAŘ, PhD. "Supply conditions in INCOTERMS® in the practice of international logistics".

April	04/04/2014	STU MTF Day
	10 -11/04/2014	ECIC 2014 - The 6th European Conference on Intellectual Capital
	24/04/2014	Doctoral Conference
	25-26/04/2014	Festival of Science - European Forum for Innovation 2014

May	15/05/2014	Meeting with former employees
	19 -21/05/2014	International Doctoral Seminar 2014 in Zielona Góra
	20-23/05/2014	Presentation of STU MTF at the TECHFORUM 2014 Fair
	26.5.	ESAB 2014 Conference

June	25-26/06/2014	Admittance procedure for Bachelor`s degree studies in the academic year 2014/2015

July	07-11/07/2014	Awards given to students for their exceptional study achievements in the academic year 2013/2014 – Master's degree studies
	18/07/2014	Film festival at STU MTF
	28/08/2014	Signed Agreement on the next stage of the USP construction - Research workplace of Automation and ICT Implementation in Production Processes and Systems with laboratories



September	03-06/09/2014	Forming 2014 Conference
	04-05/09/2014	Summer School of Young Mechatronic Trainees
	10/09/2014	Opening ceremony of the 2nd phase of UVP construction
	11/09/2014	Summer University for Secondary School Students
	26/09/2014	Night of researchers – participation of STU MTF
	29/09-03/10/2014	International Engineering Fair in Brno - participation of STU MTF


October	23/10/2014	Power sources of regions - TTSK conference


November	10/11/2014	Immatriculation of students
	18/11/2014	Presentation days of companies
	25/11/2014	Granting Dr. h. c. Dipl. Ing. (FH) to Peter Doll

December	04/12/2014	Chess Tournament – Cup of the STU MTF Dean
	05/12/2014	Christmas Bazaar
	06/12/2014	Santa Claus at MTF
	12/12/2014	Pre-Christmas party - STU MTF Dean invites Faculty employees
	14/12/2014	General Assembly of the Bank of Quality – Alumni STU MTF, civic assoc.

ACTIVITIES OF THE PUBLIC RELATIONS DIVISION IN 2014

- Principal guarantor of the following events: New Year's Meeting, Santa Claus at MTF, St. Gorazd Award and MTF Day
- Publishing updates on the Faculty website
- Faculty news in the media
- Support for other Faculty events
- Graphical design of the materials for various events
- Photo-documentation, video recordings and promotion of events
- Organisation of the Faculty's participation in fairs and exhibitions
- Monitoring the Faculty activities, events, press releases and TV discussions
- Updating of the poster display and Technology Museum

EDITORIAL ACTIVITIES IN 2014

- accepted methodology for writing scientific monographs agreed on the basis of qualification theses
- editorial activities in the field of electronic textbooks, scientific monographs, MTF journals and proceedings
- processing of Faculty journals in the Versita system (journals are indexed in the following databases:
  - amending the statute of editorial activities, including the administration of anonymous reviewing
  - update and administration of the publishing portal at STU MTF
  - mapping the publication space of STU MTF on the **Science Publishing Group** website
  - implementation of custom publishing processes at STU MTF
  - provision of updates to the Slovak language section of the Faculty website
  - format and modification to STU MTF webpage of the AlumniPress Publishing House

Faculty journals - the Faculty publishes two journals - **Research papers of the STU MTF** and the Internet journal, **Materials Science and Technology**. Both journals are published in the English language. They are focused on the Faculty research fields - materials engineering, metallurgical and mining sciences, mechanical engineering (machine technologies), computer science, automation and telecommunications and environmental engineering. Both journals provide double-blind review, which guarantees:

- impartial reviews of the quality of published outputs,
- confirmation of established knowledge of the current state of the issues in domestic and foreign literature, the systematic analysis and synthesis,
- explanation of the used evaluation criteria in the paper,
- originality of the authors contribution to fundamental issues of theory, methodology and innovation, incentives for new research orientation,
- clear characteristics of the procedures used, especially in the application of statistical and empirical data,
- contribution to the knowledge of the current state of the art, knowledge transfer and the development in the field,
- excluded possibility of reviewer bias against the author,
- an increased rate of fair judgment and evaluation of benefits of the contributions.

The priority of the Faculty is the registration of journals in the monitored databases (WoS, Scopus, and so on). The main instrument to support the acquisition of the Impact Factor for the journals is electronic publishing through the MetaPress technology that provides increased awareness of the journal, an interest in publishing, citing strategy thanks to AIS (automatic indexing of published papers) and making active links to the cited works. By serving metadata in abstracting and indexing services, as well as full-text databases, issuing and registration of DOI codes (Digital Object Identifier) for each published paper is one of the steps to register the journals in databases required in the terms of accreditation.

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

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

In 2014, the AlumniPress Publishing House became a member of the Association of Publishers and Booksellers of the Slovak Republic

Publication plan for 2014:

Type of publication	**published**
monograph	6
Textbook	8
editorial for foreign monograph	12

The monitoring and searching for appropriate publication spaces for doctoral candidates is one of the priority tasks of information management of supportive departments of the Faculty (Academic Library, Publishing House) to support the publication of results achieved by scientific research. Of course, by creating a domestic space, the opportunity for the transfer of these results (does not reach the top international quality) is provided, but the aim is particularly **to find a reputable foreign space for scientific publication outputs**. This activity is consistent with the conceptual plan for the development of the Faculty. The benefits of the economic value can be measured or estimated only by a relatively complex system. There can be expected a quantifiable increase in income subsidy from achieving the publication outputs in top international quality, the increase in grant success, the enlarged interest of students in postgraduate study based on the selection criteria in their decision of the curricular field. On the other hand, there are benefits characterised by:
- new foreign publications space for STU MTF in renowned foreign publishers,
- strengthening of the category "top international quality",
- possible co-authorship with foreign partners and the possibility of comparative scientific works,
- the possibility of an increased proportion of citations of authors from STU MTF.

SOCIAL PROGRAMMES FOR EMPLOYEES OF THE FACULTY OF MATERIALS SCIENCE AND TECHNOLOGY

STU MTF creates the following conditions of social policy for employees according to their rights defined in legislation. The management of STU MTF 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 introduced on the basis of the satisfaction survey.

Events financed from the social fund:
- Concert for STU MTF employees at the pre-Christmas Party,
- Theatre performance at the Day of STU MTF event,
- Pre-Christmas party for children of the STU MTF employees.

EMPLOYEE BOARD OF STU MTF

The employee board of STU MTF 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 STU MTF 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 the use of the gymnasium and swimming pool with employees of STU MTF and the preparation of the canteen menu; it took part as well in a petition organised with the union of employees of the school system and research in connection with creation of new labour codes.

The employee board of STU MTF:
- discussed all materials dealing with holiday planning, collective holidays, a directive of the dean regarding the 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 of the year 2014,
- participated in the evaluation of adherence to the collective labour agreement terms as well as preparation of a new collective labour agreement for 2014 in the form of comments to a draft and completion of the draft,
- the submission of ideas of Faculty employees for solving problems on particular panels.

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 of employees and the creation of rules:
- admission training – 99 employees,
- periodical training of employees - 239 employees,
- training of management - 21 employees,
- induction information for students during the enrolment process – 1482,
- training of employees to provide first aid – 20 employees.

ALUMNI

On 19/3/2011 the civil association, the Bank of Quality – Alumni STU MTF was established. This association creates space and conditions for Faculty communication with former graduates.

Activities of Alumni
Meeting of the general assembly of the association
English translation of the association website
Electronic journal Alumni Magazine of the association established
Newsletter sent to the registered members of the association

Alumni Related Activities in 2014:

General Assembly of the Alumni members took place on 18/12/2014
New Alumni Charter admitted on 18/12/2014
Changes in the Alumni Management (Alumni Chair since 01/12/2014 – Prof. Ing. Milan Marônek, PhD., Vice-dean for Internal and International Relations)
Updates to the Alumni portal
Newsletter in Slovak language –41 pieces, in English language – 19 pieces
Alumni magazine – issued once a year–0 1-03/2014
Publicising job openings on the Alumni portal (year 2014: 37)
Promotion of the Faculty graduates and monitoring their performance on the job market (in Slovak and English languages)
Promotion of prepared events, updating, preparing photo-galleries
Designing web pages and new navigation elements, and their regular update
Administering the mail of the Bank of Quality – assistance in the graduates' registration, entering data into the Alumni database
Production and distribution of the membership passports
Sending information mails regarding the Faculty events to all registered members
Designing and printing the information Alumni leaflets for the graduating students

Visits to the Alumni portal (01/01/2014 – 15/12/2014): **8533**

Number of alumni registered in the Bank of Quality - Alumni of STU MTF by 11/12/2014: **582**

Account number of the Alumni association: 2957128851/0200
IBAN: SK27 0200 0000 0029 5712 8851

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 STU MTF".

This part of Annual Report 2014 was verified by doc. Ing. Helena Makyšová, PhD. and Prof. Ing. Milan Marônek, PhD.

INSTITUTES

INSTITUTE OF MATERIALS SCIENCE

CONTACT

Director: prof. Ing. Jozef Janovec, DrSc.
e-mail: jozef.janovec@stuba.sk
tel.: +421918646072

New management of Institute since 01/12/2014

Director Prof. Ing. Ľubomír Čaplovič, PhD.
e-mail: lubomir.caplovic@stuba.sk
tel.: +4219186460043

Address: Jána Bottu 25, 917 24 Trnava, Slovak Republic
tel.: +421918646038
fax: +421906068499

STAFF

- Professors: 7
- Assoc. Professors: 11
- Senior Lecturers: 14
- Research Fellows: 7
- PhD Students: 28

EDUCATION AT THE INSTITUTE

Number of students (as on 31/10/2014) registered on study programmes offered by the Institute: **165**
Number of students graduated (in the academic year 2013/2014) from the study programmes offered by the Institute: **50**

STUDY PROGRAMMES

- Materials Engineering
- Processing and Application of Non-Metals
- Production Quality
- Engineering of Production Quality

ACTIVITIES OF THE INSTITUTE

Date	Title of event or activity at the Institute in 2014
21/01 – 24/01/2014	Course of Physics for MTF students
29/01/2014	Participation in the Open Day – presentations and sight-seeing tours of the laboratories
03/02 – 04/02/2014	Participation in the STU MTF Doctoral Day
20/05 – 23/05/2015	Presentation of CE Aprodimet in MSV, NItra
11/09 – 12/09/2015	Participation in the Summer University of Secondary-school Students – lecture and experimental exercise in Microscopy
05/12/2014	Mgr. Marián Palcut, PhD., awarded the title "Young researcher" by the STU Rector

GRADUATE PROFILE

BACHELOR'S PROGRAMME (Bc.)

Materials Engineering
quality management systems. He will master the subject matter of international standards for quality management and intellectual property. The graduate will have a deep knowledge of natural sciences and specific areas of plant management, particularly in designing maintaining, implementing and improving quality management systems, total quality management /TQM/ approaches, as well as modern tools and methods of quality management. The graduate is able to develop and implement quality management systems. The graduate may be employed in several areas: industrial companies, services, state administration and at all positions where synergy of management, technical knowledge and skills is needed.

POSTGRADUATE PROGRAMMES (PhD.)

Materials Engineering
The graduate from the programme will have gained a complete Bachelor's degree education in the field of Materials focused on the main kinds of technical materials. 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 knowledge 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 defectoscopic tests of materials, evaluate the structure of materials by standard procedures with the use of corresponding equipment machinery. 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 education combines the science of Chemistry, Physics, and Mathematics with the principles of mechanical, chemical, and electrical engineering; the materials scientist combines ingredients with atomic specificity and precision in order to yield a spectacular product. 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 also be able to specify and propose extensive material solutions 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 and understanding of technological and other processes in terms of their impact on structure and properties of materials, they will be able to gauge the influence of production and processing technologies on the working environment and recommend alternative solutions. The graduate will be conscious of the social, moral, legal and economic impacts of the profession and will be prepared either to continue studying at post-graduate degree level, to gain a scientific perspective across a whole range of materials engineering fields, or to enter the job market immediately. Graduates from the Master's programme will be equipped with the skills to successfully perform as a team leader or a team member in the field of materials engineering (research, development, production or implementation), individually as a project leader, an entrepreneur or a manager in industrial production.

Processing and Application of Non-metals
The graduate will gain a complete university education in the study field of Materials with specialisation in non-metallic materials. The graduate will understand the production, technical treatment, testing, exploitation and degradation of non-metallic materials such as plastic, ceramics, glass, rubber and some special kinds of materials, in addition to the correlations between structure and properties of the mentioned materials, as well as control of their quality and processes of diagnosis. The graduate will develop his or her knowledge of production, treatment, quality control, application, recycling and secondary treatment of the mentioned materials, in addition to methods, technologies and appliances of properties analysis, selection and application of non-metallic materials. Graduates from the programme can then go on to work as a manager or team member (research, development, production or application of non-metallic materials), independently as a project manager, a manager of his or her own company or as a manager in industrial production with this specialisation.

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, production, implementation 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 perform as a researcher in research institutes, at universities or a highly-qualified specialist in large industrial companies typically focused on the production of materials or technological processing of materials for semi-products and products.

Processing and Application of Non-metals
The graduate will develop knowledge of the principles of scientific individual and team work as well as the procedures leading to individual problem solving in the field of non-metallic materials. The graduate will then be ready to discover and bring new independent solutions to problems, scientifically formulate the problem and present his or her own results and will be able to assess the legal and environmental aspects, and ethical and social aspects of scientific work. The graduate understands the connections between research, development, production, use, recycling and aspects of research and development of new materials (especially based on glass, plastics and ceramics). The graduate may work as a scientific/research worker in research institutes, at universities or in large industrial enterprises focused on the production of materials or technological processing of materials into semi-finished products and products.

LIST OF SUBJECTS OFFERED BY THE INSTITUTE

Advanced Materials and Technologies
Bachelor's Project
Bachelor's Thesis
Degradation Processes and Prediction of Lifetime
Graduation Project
Diploma Thesis
Dissertation Project I-VI
Electrotechnics and Electronics
Experimental Methods of Materials Investigation I-II
Heat Treatment of Materials
Heat Treatment Technology
Chemical Heat Treatment
Materials in Power Engineering
Materials Science I-II
Mechanical Testing and Defectoscopy Of 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 I-VI
Physical Measurement Methods of Non-metallic Materials
Physics I-II
Physics of Materials
Processing Technologies of Non-metallic Materials
Professional Practice
Research Paper I-VII
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
Semestral Project I-II
Structure and Properties of Non-metallic Materials
Technology of Materials Production
Theory and Technology of Plastics Processing
Theory of Materials Production
Theory of Materials Treatment
Theory of Phase Transformations
Utility Properties and Materials Design
Vacuum Engineering and Technology

GRADUATE THESES

List of theses contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Master's Theses
Gondek, J.: Analysis of Zn-based coating alloys
Demeter, J.: Analysis of surface tension and microstructure of lead-free solders based SAC
Škrobáková, I. S.: Application of differential scanning calorimetry in investigation of plastics and complex metallic alloys
Suchá, B.: Structure analysis of SBR/NR rubber and its vulcanizate
Bilický, M.: Quality Diagnostics preparation of composite materials with higher electrical conductivity
Nemcová, N.: Electrical and Dielectric Properties Glasses System Sb2O3 - TeO2 - PbCl2
Kocian, T.: Assessment methods of anticorrosion efficiency selected coatings systems
Lašček, L.: Modelling of thermodynamics properties and phase equilibrium in selected plastics and complex metallic alloys
Csémi, M.: Ultimate tensile strength of soldered joints produced by lead-free solders with cerium addition
Komarňanský, M.: Melts rheology of selected thermoplastic
Polakovič, F.: Determination of critical parameters extrusion of low weight pipes from polyolefins and polyvinylchloride
Babinec, M.: Study of AISI 304L and ARMCO steel interactions with ZnSn melt
Múčka, R.: Study of corrosion resistance of high alloyed Cr-Mn-N austenitic steels after isothermal exposure
Sabová, D.: Study of the fracture surface and impact test of cooled S460MC steel samples
Masláková, M.: Study of stamps microstructure made by rapid solidification from aluminium melt base
Fančovičová, E.: The study of structural inhomogeneities of high-temperature superconductor tapes by means of scanning electron microscopy
Kuracina, V.: Heat treatment of Cr – V ledeburitic tool steel with sub-zero processing
Toth, L.: Properties and structural stability of rapidly solidified complex metallic aluminum-based materials
Šuryová, N.: Properties of tool steels to 190 after subjected to boriding
Borko, P.: Effect of high-temperature exposure on the microstructure Cr-Ni austenitic stainless steel
Trnavská, A.: The influence of increased content of copper on the unleaded solders characteristics
Pančíková, M.: Identification of the plastics using infrared spectrometry

Kollarovičová, A.: Development of metal matrix composite materials strengthened by rock particles for well casing stability enhancement
Borko, P.: Degradation of superconductor structure after application of tensile stress

PhD Theses
Švantner, Tomáš: Al-AlN composites prepared by in-situ nitridation of aluminium powders
Konopka, Pavol: Characterization of defects in the structure of non-metallic superconductors
Seliga, Emil: The degradation behavior of vulcanizates of rubber compounds monitored by physical methods
Duehring, Steven: Experimental-numerical method of the failure prediction by the heat treatment of steels
Kocsisová, Edina: Study of grain boundary structure influence of secondary phase's precipitation in austenitic stainless steels
Grgač, Dušan: Influence of thermal aging on the safety significant components in nuclear power plants WWER 440

RESEARCH AT THE INSTITUTE

Areas of Research
- advanced complex metallic alloys and other structurally complex materials,
- alloy steels for energy industries,
- lead-free solders,
- materials with non-crystalline structures,
- computational chemistry in materials science,
- thermodynamic modelling of phase equilibria and processes in materials,
- coatings and surface treatment,
- superconducting materials.

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 and properties of high-temperature superconducting tapes. 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 "Centre for development" and the application of advanced diagnostic methods in the processing of metallic and non-metallic materials. Equipment acquired includes a high-resolution scanning electron microscope; JEOL 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 4.250SP1-WM, a Charpy impact tester; CHK300J-I, a simultaneous thermal analyser; 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 viscosimeter; Gemini II and vulcanisation measurement equipment; D-MDR 3000. The furnace for chemical heat treatment; CHTZ 15, and the PVD coating unit; PLATIT, were installed in the laboratories of the Institute. New software was also obtained related to modeling properties of materials subjected to thermal and mechanical 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 Jožef Stefan, Ljubljana (Slovenia), Vienna University of Technology (Austria), Research Centre Dresden-Rossendorf (Germany), Institute of Physics of Materials, Academy of Sciences of the Czech Republic, Brno (Czech Republic), Faculty of Mechanical Engineering, University of Ljubljana (Slovenia) and other Slovak universities and institutes of the Slovak Academy of Sciences. From the list of industrial partners the most recognised are Bekaert SA (Belgium), Böhler – Edelstahl, Branson div. Emerson, and Benteler (Germany). The Institute has a long established tradition of cooperation with regional industrial partners.

Areas of expertises
- Material Degradation and Accidents
- Laboratory Technology for Material Diagnostics
- Structure Analysis
- Thermal Analysis
- Microsocopy and Diffraction Analysis
- Spectroscopy Analysis
- Space Phenomena
- Advanced Materials
- Fusion and Fusion Reactors
- Lead-free Solders
- Materials for Energetics
- Corrosion Processes
- Coatings for Tool Steels
- Heat Treatment of Materials

PROJECTS OF THE INSTITUTE

Project Title	**A study into the metallurgy nature of the structure and property changes of Cr-V ledeburitic steel by sub-zero treatment**
Coordinator	Prof. Ing. Peter Jurči, PhD.
Start Date	01/ 01/ 2014
End Date	31/12/2016
Programme	VEGA
Annotation	The project is focused on the study of the phenomena taking place in the selected chromium-vanadium ledeburitic tool steel during sub-zero treatment and and various regimes of such treatment. The research will determine the effect of the key process variables such as tempering and holding on the temperature of sub-zero treatment on the microstructure, hardness, toughness in 3-point bending, fracture toughness and wear-resistance. The project will use a wide range of experimental techniques, which will enable attainment of the main goal of the project: a detailed and complex analysis of the phenomena in the microstructure of selected Cr-V ledeburitic steel in the conditions of sub-zero treatment under various regimes, and determination of the effect of microstructure changes taking place during sub-zero treatment on the mechanical and tribological properties of the material.

Project Title **Using complex thermoanalysis and computer thermodynamics in the study of processes in advanced material systems.**
Coordinator doc. Ing. Roman Čička, PhD.
Start Date 01/01/2014
End Date 31/12/2017
Programme VEGA
Annotation The project is focused on utilising the experimental and computer thermodynamics in the study of processes and phase equilibria in perspective material systems such as complex metal alloys, advanced tool steels, corrosion-resistant austenitic steel, Al-based hardenable alloys and lead-free solders. In the experimental part, a complex thermoanalysis of the examined systems along with the measurements of some important thermo-physical quantities and a structure analysis will be carried out. Thermo-Calc, JMatPro, Dictra, ANSYS, SYSWELD, DEFORM and MATLAB programmes will be used to calculate the model phase equilibria and processes taking place in the examined materials during the controlled temperature regime. The project objective is to improve the prediction ability of phase equilibria and the processes in material systems by using advanced methods of computer thermodynamics.

Project Title **Corrosion resistance of advanced metal alloys on the basis of zinc, aluminium and tin**
Coordinator Mgr. Marián Palcut, PhD.
Start Date 01/01/2014
End Date 31/12/2017
Programme VEGA
Annotation The aim of the project is the study of the corrosion resistance of phases in the Zn, Al ans Sn-based alloys. The studied materials can be used as light construction materials for the automobile and aviation industries, protective coatings of steels and lead-free solders for microelectronics. The allots will be prepared by melting pure metals in the protective atmosphere or under the layer of flux. Corrosion resistance will be studied in water solutions of electrolytes. Simultaneously, corrosion resistance will be examined by an accelerated test in a fog chamber. Selected samples will be subjected to mechanical tests for their susceptibility to corrosion cracking under stress. Corrosion products will be examined by a combination of methods of X-ray diffraction, energy-disperse spectroscopy, transmission electron microscopy and reflective infrared spectroscopy. High-temperature corrosion resistance of selected samples will be also investigated. The contribution of the project will be the identification of corrosion-resistant alloys for practical applications.

Project Title **A Centre of Excellence for functionalised multiphase materials (FUNMAT)**
Coordinator prof. Ing. Jozef Janovec, DrSc.
Start Date 04/08/2011
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 catalythically active surfaces of metals, plasmonic effects, photovoltaic and thermoelastic polymer structures, as well as from the field of biosensors. The acquired knowledge enables targeted functionalisation of materials with the goal to achieve the required specific properties such as mechanical toughness, chemical selectivity, increased quantum efficiency of light conversion and others. The final aim is a marked added value in research, the development and the implementation of unique high-tech solutions based on a multidisciplinary approach and the connection of research subjects with expertise in the field of physics of solids, quantum optics, materials engineering, inorganic chemistry, chemistry of polymers and biology.

Project Title **Interactions in bio and nanosystems**
Coordinator at MTF prof. RNDr. Miroslav Urban, DrSc.
Start Date 01/05/2011
End Date 31/10/2014
Programme APVV, General Call
Annotation The bonding characteristics, including chemical and hydrogen bonds to weak intermolecular interactions are essential in apparently remote areas like biophysics and material sciences. Recently, benchmarking data was obtained for properties of molecules and their interactions, using the Coupled Cluster CCSD (T) method capable of recovering a substantial part of the electron correlation. It provides reliable predictions of molecular properties. Innovations developed within the project remit allow CC molecular calculations with more than 80 correlated electrons and basis sets with up to 1500 functions. Real applications require properties of large molecules and clusters, inaccessible to rigorous methods. As a result, computationally less demanding DFT and semi-empirical methods will be used. The accuracy control of appropriate methods using relativistic CC data for smaller model systems is essential in this project. Intermolecular interactions will be exploited "in silico" drug design, "docking and scoring" analysis and the description of the ligandactive site of the protein. The activity of "Aurora" kinase inhibitions in tumour 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 on surfaces and cavities will be obtained. A model will be proposed as part of the research findings in order to summarise the application of Aunanoparticles in relation to material sciences and drug design. Polymer interactions based on HCNB clusters will also be studied.

Project Title **Solidification and properties of novel peritectic TiAlbased alloys**
Coordinator at MTF Ing. Svetozár Demian
Start Date 01/05/2011
End Date 31/10/2014
Programme APVV, General Call
Annotation Peritectic alloys based on TiAl are excellent candidates for near net shape casting of lightweight structural components for aircraft and automotive engines, industrial gas turbines and new generation of nuclear reactors. To advance the knowledge in the emerging casting technology sector of TiAlbased alloys, the SOPERIT project aims to investigate microstructure formation and segregation during solidification and solid phase transformations of novel peritectic TiAlbased alloys. The attention is directed to understand the effect of solidification parameters and alloying on the primary solidification phase, solidification path, phase equilibria, the columnartoequiaxed transition (CET, texture formation and nucleation activity of peritectic phase which will open up new opportunities for alloy and process design. The novel peritectic alloys with a fine grain structure will be designed and their microstructure and properties (chemical, physical and mechanical) will be characterised. Fine grain structure will be achieved through appropriate alloying affecting nucleation of peritectic phase and solid phase transformations. Unique CET experiments will provide advanced knowledge about the mechanisms of nucleation of equiaxed grains, associated segregation and the necessary input data for CET modelling. Parallel to these research activities, laboratory near net shape casting techniques based on plasma melting in a water-cooled

crystalliser and gravity casting into ceramic moulds will be developed.

Project Title **Research and development of advanced materials, processing and automation technologies for direct manufacturing and application**
Coordinator doc. Ing. Martin Kusý, PhD.
Start Date 01/09/2011
End Date 31/08/2014
Programme Other international
Annotation The subject of the research is focused on advanced materials, processing and automation technologies for direct manufacturing and its application.

Project Title **The structure, properties and processes at surfaces and interfaces of materials from first principles calculations**
Coordinator RNDr. Andrej Antušek, PhD.
Start Date 01/01/2012
End Date 31/12/2015
Programme VEGA
Annotation The project is focused on density functional calculations of surface and interface structures relevant for materials science and chemistry. Through the application of methods of theoretical and computational chemistry, the research will address the growth of a thin layer and the subsequent thermodynamic properties of such structures with possible applications in brazing and joining technology. Using our previous experience with intermolecular interactions, the research will model interactions of molecules with surfaces, with a focus on increasing the understanding of the bonding mechanism. For smaller model systems accurate relativistic CCSD (T) calculations will be used as benchmarks to verify DFT results. Wave function calculations may also be useful for the selection of a proper DFT functional.

Project Title **A study of crystal structure and thermodynamic properties of aluminiumbase and zincbase complex metallic alloys**
Coordinator prof. Ing. Jozef Janovec, DrSc.
Start Date 01/07/2012
End Date 31/12/2015
Programme APVV, General Call
Annotation The project is focused on the study of phases, their equilibria, and transformations due to changes in temperature and chemical composition in aluminiumbase and zincbase complex metallic alloys, as well as on the determination of their crystal structure, This study will be carried out using experimental (Xray diffraction, DTA, DSC, TEM, electron diffraction, SEM, EDX, WDX, and EBSD) and theoretical (CALPHAD, DFT and empirical potentials) tools. Selection of alloys will be focused on systems where one component is either aluminium or zinc, and the remaining components are formed by transition metals. The project may significantly contribute to complementation and clarification of phase diagrams in areas that are less well-known and poorly studied. The emphasis will be placed on areas where structurally complex and quasicrystalline phases could be supposed. The contribution to finding of new quasicrystalline and structurally complex phases is anticipated. Theoretical study of these phases will lead to a more detailed description of their crystal structure, as well as to a deeper understanding of the relationship between the structure and physical properties.

Project Title **A study into the structural and mechanical stability of a new extremely hard coating for the construction and tool materials**
Coordinator Prof. Ing. Ľubomír Čaplovič, PhD.
Start Date 01/01/2012
End Date 31/12/2014
Programme VEGA
Annotation The project is aimed at analysing the 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 (HRSEM, 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 interphase interfaces with substrate, structural tension relations in the layers, way of heat treatment prior to and post the PVD application and their tribological properties.

Project Title **The effects of inhomogeneities on the functional properties of hightemperature superconducting wires**
Coordinator Mgr. Michal Skarba, PhD.
Start Date 01/01/2011
End Date 31/12/2014
Programme VEGA
Annotation Nonmetallic superconductors based on a mixture of Y, Ba and Cu oxides (YBCO) are well known materials showing superconductive properties at relatively high temperatures. Structural analysis of micrometer superconducting layers on metallic substrate enables an understanding of the relationship between the parameters of preparation of layer and its properties. During deposition of layer on metallic substrate and during further processing, defects in the structure of thin layers of YBCO develop. These defects significantly affect the electromagnetic properties of superconductors, especially critical current and ac losses. Information about defects in layers of YBCO, inferred from structural analysis, is useful to decrease imperfections during the production of superconducting layers. It is also necessary for the development of superconducting devices, because they can have a significant influence on their working characteristics. Evaluations of structure of thin superconductive layers will be performed mainly with (highresolution) TEM.

Project Title **Study of relaxation mechanisms in composites with special carbon-based filling**
Coordinator doc. Ing. Marian Kubliha, PhD.
Start Date 01/01/2013
End Date 31/12/2015
Programme VEGA
Annotation The project is aimed at the implementation of measurements of selected physical parameters in the study of composites with polymeric matrix with an emphasis on the investigation of relaxation mechanisms in the structure. In the case of the matrix formed from reactoplast, the project is oriented on the evaluation of the impact of nanoparticles and carbon fibres (content and the arrangement of the individual phases) on mech-

anisms of dielectric behaviour. In the case of the matrix based on elastomers, the critical processes are examined in the formation of rubber mixture vulcanisers, as well as in their thermomechanical degradation. Correlations between the composition of the investigated system and the values of the rheological, electrical, dielectric quantities at nonisothermal heating of rubber mixtures are described. Important characteristics such as the resistance to thermomechanical exposure and the reproducibility of the properties defined by the values of the physical properties are discussed, too.

Project Title **Study of the turbulent accretion process in accreting binary systems through flickering activity**
Coordinator Mgr. Andrej Dobrotka, PhD.
Start Date 01/01/2013
End Date 01/01/2015
Programme VEGA
Annotation The main purpose of the project is to study turbulent flow in the high Reynolds number (Re) regime, not accessible in today's laboratories. Accretion systems are unique cosmic experiments to do so. The turbulence minimum dimension scales in the fluid are described by the Re. The largest scales of fluid motion are set by the overall geometry of the flow and are dissipating into smaller eddies up to the minimal dimension scale. From the basic fluid mechanics it is well known that higher Re numbers yield a smaller minimal dimension scale. From Re about 10^6 the dissipation toward smaller scales of turbulent elements is so strong that the fluid becomes quasilaminar. The bigger eddies should dissipate and hence disappear. Today Re estimates from Earth point towards a value of about 10^8. What is happening then? The typical Re in an accretion disc of cataclysmic variables is of about 10^12 and one of the possibilities to explain flickering is turbulence in the disc.

Project Title **The Influence of exposure conditions on the evolution of binary and ternary phases in aluminiumbased complex metallic alloys**
Coordinator prof. Ing. Jozef Janovec, DrSc.
Start Date 01/01/2012
End Date 31/12/2014
Programme VEGA
Annotation The evolution of binary and ternary phases under thermal activation in Albased CMAs will be studied with the intention to make the concerned phase diagrams more precise. The AlTMTM (TM=transition metal) alloys will be annealed for longterms at various temperatures and then quenched to fix the microstructure at annealing temperature. To analyse the phases, XRD, TEM, SEM, DTA, EDX, WDX, and EBSD, thermodynamic simulations will be used. Attention will be paid to the systems investigated insufficiently until now. Based on the experimental results and the available theoretical knowledge, precise thermodynamic parameters will be determined for the identified phases and the related databases will be modified. The use of advanced experimental methods gives rise to methodological innovations. The project is expected to contribute to the basic knowledge and perhaps to the discovery of new phases exhibiting original properties.

Project Title **Chemical sputtering: Computational modelling of interactions in the carboncontaining films exposed to molecular ions and hydrogen EURATOM CU**
Coordinator prof. RNDr. Miroslav Urban, DrSc
Start Date 01/01/2010
End Date 01/09/2014
Programme Euromat
Annotation The formation of small hydrocarbons, their chemistry and cracking pattern upon the electron (e) impact and/or the thermodynamics of the formation of saturated lower hydrocarbons. Interaction energies of the hydrogen, nitrogen and molecular ions with compounds representing and modelling interactions with hydrogenated carbon films. Calculations of ionisation potentials of small hydrocarbons, CxHy (CxHyDz) and their ions, their properties and thermodynamic stability.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

Country	Employee
Belgium	Skarba Michal, Mgr. , PhD.
Czech Republic	Bošák Ondrej, Mgr., PhD. Čaplovič Ľubomír, prof. Ing., PhD. Čička Roman, doc. Ing., PhD. Drienovský Marián, Ing., PhD. Hudáková Mária, doc. Ing., PhD. Jurči Peter, prof. Ing., PhD. Kusý Martin, doc. Ing., PhD. Labaš Vladimír, doc. RNDr., PhD. Palcut Marián, Mgr., PhD. Pekarčíková Marcela, Dr.- Ing. Péteryová Magda, Mgr. Sahul Martin, Ing., PhD. Špoták Martin, Ing. Šutiaková Ingrid, Ing.
Chile	Urban Miroslav, prof. RNDr., DrSc.
France	Čaplovič Ľubomír, prof. Ing., PhD. Urban Miroslav, prof. RNDr., DrSc.
Croatia	Černičková Ivona, Ing., PhD. Priputen Pavol, RNDr., PhD.

Country	Employee
Japan	Dobrotka Andrej, Mgr., PhD.
Hungary	Antušek Andrej, RNDr., PhD. Holka Filip, Mgr., PhD. Janovec Jozef, prof. Ing., DrSc. Šulka Martin, RNDr., PhD. Šulková Katarína, RNDr., PhD. Urban Miroslav, prof.RNDr., DrSc.
Germany	Čaplovič Ľubomír, prof. Ing., PhD. Černičková Ivona, Ing., PhD. Dománková Mária, doc. Ing. , PhD. Kusý Martin, doc. Ing., PhD.
Poland	Antušek Andrej, RNDr., PhD. Čička Roman, doc. Ing., PhD. Janovec Jozef, prof. Ing., DrSc. Lokaj Jan , prof. Ing. CSc.,
Portugal	Čaplovič Ľubomír, prof. Ing., PhD. Sahul Martin, Ing., PhD.
Austria	Pekarčíková Marcela, Dr.- Ing. Skarba Michal, Mgr., PhD.

Country	Employee
Russia	Sahul Martin, Ing., PhD.
USA	Sahul Martin, Ing., PhD. Lokaj Jan , prof. Ing. CSc.,
Switzerland	Antušek Andrej, RNDr., PhD. Skarba Michal, Mgr., PhD.
Italy	Urban Miroslav, prof. RNDr., DrSc.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Union of Slovak Mathematicians and Physicists
Mgr. Ondrej Bošák, PhD.

Slovak Physical Society
doc. Ing. Marián Kubliha, PhD.
Mgr. Ondrej Bošák, PhD.
Mgr.Andrej Dobrotka, PhD.
prof. RNDr. Milan Ožvold, PhD.
doc. Ing. Róbert Riedlmajer, PhD.
Ing. Roman Čička, PhD.
RNDr. Igor Jančuška, PhD.
Mgr. Jozef Krajčovič, PhD.
doc. RNDr. Vladimír Labaš, PhD.
doc. Ing. Stanislav Minárik, PhD.
RNDr. Pavol Priputen, PhD.
Ing. Lýdia Rízeková Trnková, PhD.

Slovak Chemical Society
prof. RNDr. Miroslav Urban, DrSc.

Slovak Academy of Sciences / Metal Science Society
prof. Ing. Jozef Janovec, DrSc.
doc. Ing. Ľubomír Čaplovič, PhD.
Ing. Lýdia Rízeková Trnková, PhD.
doc. Ing. Mária Hudáková, PhD.
Ing. Viktória Sedlická, PhD.
doc. Ing. Martin Kusý, PhD.
doc. Ing. Roman Moravčík, PhD.
Mgr. Ondrej Bošák, PhD.
doc. Ing. Marián Kubliha, PhD.
prof. Ing. Peter Grgač, PhD.
Ing. Roman Čička, PhD.

Information Society of Education
Mgr. Jozef Krajčovič, PhD.

Expert Group of the Chemistry and Physics of Solids
doc. Ing. Ľubomír Čaplovič, PhD.

Slovak Astronomical Society
Mgr. Andrej Dobrotka, PhD.

Slovak Academy Society
prof. RNDr. Miroslav Urban, DrSc.
prof. Ing. Jozef Janovec, DrSc.

Learned Society at the Slovak Academy of Sciences
prof. RNDr. Miroslav Urban, DrSc.

Slovak Commission for Scientific Degrees
prof. Ing. Jozef Janovec, DrSc.

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

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

IUCr International Union of Crystallography
doc. Ing. Ľubomír Čaplovič, PhD.
prof. Ing. Jozef Janovec, DrSc.

ASM International – American Society for Metals
doc. Ing. Ľubomír Čaplovič, PhD.

European Physical Society
doc. Ing. Róbert Riedlmajer, PhD.
doc. Ing. Marián Kubliha, PhD.
Mgr. Ondrej Bošák, PhD.
Ing. Roman Čička, PhD.

Czech and Slovak Crystallographic Association
doc. Ing. Martin Kusý, PhD.
doc. Ing. Ľubomír Čaplovič, PhD.

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

Regional Committee of the IUCr
doc. Ing. Ľubomír Čaplovič, PhD.

CVC Integral Working Group
Mgr. Andrej Dobrotka, PhD.

Association for the Heat Treatment of Metals
prof. Ing. Peter Grgač, PhD.
prof. Ing. Peter Jurči, PhD.

European Powder Metallurgy Association
prof. Ing. Peter Jurči, PhD.

North-Atlantic Consortium on Non-Oxide Glasses (NACNOG)
doc. Ing. Stanislav Minárik, PhD.
doc. Ing. Marián Kubliha, PhD.
doc. 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.

International Astronomical Union
Mgr. Andrej Dobrotka, PhD.

Swift Nova-CV Group
Mgr. Andrej Dobrotka, PhD.

PUBLICATIONS (most important publications in 2014)

List of publications contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Adamech, Marek - Černičková, Ivona - Ďuriška, Libor - Kolesár, Vladimír - Drienovský, Marián - Bednarčík, J. - Svoboda, M. - Janovec, Jozef: Formation of less-know structurally complex zéta b and orthorhombic quasicrystalline approximant epsilon n on solidification of selected Al-Pd-Cr alloys. – **registered in: Master Journal List, Scopus.** In: Materials Characterization [elektronický zdroj]. - ISSN 1044-5803. - Vol. 97 (2014), online, pp. 189-198

Behúlová, Mária - Mesárošová, Jana - Grgač, Peter: Analysis of the influence of the gas velocity, particle size and nucleation temperature on the thermal history and microstructure development in the tool steel during atomization. - **registered in: Web of Science, Master Journal List, Scopus.** In: Journal of Alloys and Compounds. - ISSN 0925-8388. - Vol. 615, iss. S1 (2014), S217-S223.

Bílek, Pavel - Jurči, Peter - Hudáková, Mária - Pašák, Matej - Kusý, Martin - Bohovičová, Jana: Cr2N-7Ag nanocomposite thin films deposited on Vanadis 6 tool steel. - ITMS 26220120048. - **registered in: Web of Science, Master Journal List, Scopus.** In: Applied Surface Science. - ISSN 0169-4332. - Vol. 307 (2014), pp. 13-19.

Csanádi, Tamás - Bľanda, Marek - Duszová, Annamária - Chinh, Nquyen Q. - Szommer, Péter - Dusza, Ján: Deformation characteristics of WC micropillars. - **registered in: Master Journal List, Scopus.** In: Journal of the European Ceramic Society. - ISSN 0955-2219. - Vol. 34, iss. 15 (2014), pp. 4099-4103.

Černičková, Ivona - Švec, Pavel - Watanabe, S. - Čaplovič, Ľubomír - Mihalkovič, M. - Kolesár, Vladimír - Priputen, Pavol - Bednarčík, J. - Janičkovič, Dušan - Janovec, Jozef: Fine structure of phases of epsilon-family in Al73.8Pd11.9Co14.3 alloy. - **registered in: Web of Science, Master Journal List, Scopus.** In: Journal of Alloys and Compounds. - ISSN 0925-8388. - Vol. 609 (2014), pp. 73-79.

Demovič, Lukáš - Kello, Vladimír - Urban, Miroslav: Relativistic calculations of low-lying electronic states of ruthenium and osmium. - **registered in: Web of Science, Master Journal List, Scopus.** In: Journal of Physics B - Atomic Molecular and Optical Physics. - ISSN 0953-4075. - Vol. 47, Iss. 2 (2014), Art.No.025001.

Dobrotka, Andrej - Mineshige, S. - Ness, Jan-Uwe: Resolving different sources of fast X-ray variability of the dwarf nova RU Peg in quiescence. - **registered in: Web of Science, Master Journal List, Scopus.** In: Monthly Notices of the Royal Astronomical Society. - ISSN 0035-8711. - Vol. 438, Iss. 2 (2014), pp. 1714-1723.

Chaus, Alexander - Fedosenko, Tatiana N. - Rogachev, Alexander V. - Čaplovič, Ľubomír: Surface, microstructure and optical properties of copper-doped diamond-like carbon coating deposited in pulsed cathodic arc plasma. - **registered in: Web of Science, Master Journal List, Scopus.** In: Diamond and Related Materials. - ISSN 0925-9635. - Vol. 42 (2014), p;. 64-70.

Kolesár, Vladimír - Priputen, Pavol - Bednarčík, J. - Černičková, Ivona - Svoboda, Michal - Drienovský, Marián - Janovec, Jozef: Evolution of phases in Al55Ni30Pd15 alloy at temperatures up to 600°C. - **registered in: Web of Science, Master Journal List, Scopus.** - ITMS 26220120014, 26220120048. In: Intermetallics. - ISSN 0966-9795. - Vol. 46 (2014), pp. 141-146.

Kubliha, Marian - Kostka, Peter - Trnovcová, Viera - Zavadil, Jiří - Bednarčik, J - Labaš, Vladimír - Pedlíková, Jitka - Dippel, A.CH. - Liermann, H.P. - Psota, J.: Local atomic structure and electrical properties of Ge20Se80-xTex (x = 0, 5, 10 and 15) glasses doped with Ho. - **registered in: Web of Science, Master Journal List, Scopus.** In: Journal of Alloys and Compounds. - ISSN 0925-8388. - Vol. 586 (2014), pp. 308-313.

Kuduzović, A - Poletti, M.C. - Sommitsch, C. - Dománková, Mária - Mitsche, S. - Kienreich, R.: Investigations into the delayed fracture susceptibility of 34CrNiMo6 steel and the opportunities for its application in ultra-high-strength bolts and fasteners. - **registered in: Web of Science, Master Journal List.** In: Materials Science and Engineering A. Structural Materials. Properties, Microstructure and Processing. - ISSN 0921-5093. - Vol. 590 (2014), pp. 66-73.

Michal, Robert - Dworniczek, Ewa - Čaplovičová, Mária - Gregor, Maroš - Čaplovič, Ľubomír - Seniuk, Alica - Kuš, Peter - Plesch, Gustav: Photocatalytic and photodisinfectant activity of sulfated and Eu doped anatase against clinically important microorganisms. - Vega 1/0605/12, 26240220002, ITMS 26220120014. - **registered in: Web of Science, Master Journal List, Scopus.** In: Ceramics international. - ISSN 0272-8842. - Vol. 40 (2014), p. 5745-5756.

Pekarčíková, Marcela - Skarba, Michal - Konopka, Pavol - Janovec, Jozef - Solovyov, M. - Pardo, Enric - Gömöry, Fedor: Investigation of defects in functional layer of high temperature superconducting tapes. - ITMS 26220120014. - **registered in: Web of Science, Master Journal List.** In: Physica C-Superconductivity and its Applications. - ISSN 0921-4534. - Vol. 497 (2014), pp. 24-29.

Puškelová, J. - Michal, Robert - Čaplovičová, Mária - Antoniadou, M - Čaplovič, Ľubomír - Plesch, Gustav - Lianos, P.: Hydrogen production by photocatalytic ethanol reforming using Eu- and S-doped anatase. - **registered in: Web of Science, Master Journal List, Scopus.** In: Applied Surface Science. - ISSN 0169-4332. - Vol. 305 (2014), pp. 665-669.

Šimeg Veterníková, Jana - Korhonen, E. - Skarba, Michal - Degmová, Jarmila - Sabelová, Veronika - Sojak, Stanislav - Slugeň, Vladimír: Study of oxide-dispersion-strengthened ferritic steels after ion implantation. - **registered in: Web of Science, Master Journal List.** In: Acta Physica Polonica A. - ISSN 0587-4246. - ISSN 1898-794X. - Vol. 125, iss. 3 : Proceedings of the 41st Polish Seminar on Positron Annihilation, Lublin, 9-13 Sept. 2013 (2014), p. 741-743.

Bílek, Pavel - Jurči, Peter - Hudáková, Mária - Čaplovič, Ľubomír - Novák, Michal: Tribology of CrAg7N coatings deposited on Vanadis 6 ledeburitic tool steel. - **registered in: Master Journal List, Scopus.** In: Materiali in Tehnologije. - ISSN 1580-2949. - Vol. 48, Iss. 5 (2014), pp. 669-673.

Černičková, Ivona - Švec, Peter - Illeková, Emília - Janičkovič, Dušan - Priputen, Pavol - Janovec, Jozef: Formation of structurally complex U-phase in Al72Pd12.8Co15.2 alloy. - ITMS. 26220120014, ITMS: 26220120048, Vega 2/0111/11. - abstract in the Proceedings: Materials structure and micromechanics of fracture (MSMF7) : 7th International Conference. Brno, July 1 - 3, 2013. Abstract booklet. - Brno : VUTIUM, 2013. - ISBN 978-80-214-4739-4. - p. 128. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 592-593 : 7th International Conference on Materials Structure and Micromechanics of Fracture (MSMF), Brno, Czech Republic, 1 - 3 July 2013. - , 2014. - ISBN 978-3037859346, pp. 517-520.

Dománková, Mária - Kocsisová, Edina - Slatkovský, Ivan - Pinke, Peter: The microstructure evolution and its effect on corrosion properties of 18Cr-12Ni-2,5Mo steel annealed at 500-900 °C. - **registered in: Web of Science, Master Journal List, Scopus.** In: Acta Polytechnica Hungarica. - ISSN 1785-8860. - Vol. 11, Iss. 3 (2014), p. 125-137.

Duszová, Annamária - Halgaš, Radoslav - Priputen, Pavol - Bľanda, Marek - Hvizdoš, Pavol - Lofaj, František - Dusza, Ján: Nanohardness of Individual Phases in WC - Co Cemented Carbides. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 586 : The 9th International Conference "Local Mechanical Properties" (LMP 2012), 7 - 9 November 2012 Levoča, Slovak Republic. - , 2014, pp. 23-26.

Hviščová, Petra - Lofaj, František - Novák, Michal: Nanohardness of CrN coatings vs. deposition parameters. - abstrakt článku v zborníku: Local Mechanical Properties 2013 : Book of Abstracts. 10th International Conference, 6 – 8/11/ 2013, Kutná Hora, Czech Republic. - Praha : Czech Technical University in Prague, 2013. - ISBN 978-80-01-05374-4. - S. 54. - APVV 0034-07, APVV 0520-10, Vega 2/0108/11. - **registered in: Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 606 : Local Mechanical Properties 2013, 10th International Conference, 6. - 8. 11. 2013, Kutná Hora, Czech Republic. - , 2014. - ISBN 978-3-03835-062-0, pp. 191-194.

Jančíková, Zora - Bošák, Ondrej - Zimný, Ondřej - Legouera, Messaoud - Minárik, Stanislav - Koštial, Pavel - Poulain, Marcel - Soltani Mohamed, Toufik: The neural network analysis of optical glasses transmittance. - **registered in: Scopus.** In: ICCC 2014 : 15th International Carpathian Control Conference, 28 - 30 May

2014, Velké Karlovice, Czech Republic. - Piscataway : IEEE Computer Society, 2014. - ISBN 978-1-4799-3528-4. - pp. 196-200.

Janovec, Jozef - Černičková, Ivona - Priputen, Pavol: Complex metallic alloys - microstructure characterization. - ITMS: 26220120014, ITMS: 26220120048. - abstrakt článku uverejnený v zborníku: Materials structure and micromechanics of fracture (MSMF7) : 7th International Conference. Brno, July 1 - 3, 2013. Abstract booklet. - Brno : VUTIUM, 2013. - ISBN 978-80-214-4739-4. - S. 117. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 592-593 : 7th International Conference on Materials Structure and Micromechanics of Fracture (MSMF), Brno, Czech Republic, 1 - 3 July 2013. - , 2014. - ISBN 978-303785934-6, pp. 483-488.

Jurči, Peter - Bohovičová, Jana - Hudáková, Mária - Bílek, Pavel: Characterization and wear performance of CrAgN thin films deposited on Cr-V ledeburitic tool steel. - **registered in: Web of Science, Master Journal List, Scopus.** In: Materiali in Tehnologije. - ISSN 1580-2949. - Vol. 48, Iss. 2 (2014), pp. 159-170.

Koleňák, Roman - Kostolný, Igor - Čička, Roman: Research of fluxless soldering of high-purity aluminium with solders type Zn-Al. - **registered in: Scopus.** In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 905. - , 2014, pp. 132-136.

Kramár, Tomáš - Kolařík, Ladislav - Kolaříková, Marie - Sahul, Martin - Pospíšil, David: Capacitor discharge welding of aluminium studs. - **registered in: Scopus.** In: Manufacturing technology [elektronický zdroj]. - ISSN 1213-2489. - Vol. 14, No. 2 (2014), online, pp. 199-206.

Moncol, Jan; Tarabova, Denisa; Lokaj, Jan; et al.: Crystal Structure of 2,2-dimethyl-5-[(2-metylhydrazinyl)methylidene-1,3-dioxan-4,6-dione.- **registered in: Web of Science** JOURNAL OF CHEMICAL CRYSTALLOGRAPHY Volume: 44 Issue: 9 pp: 466-470 Published: SEP 2014

Soka, Martin; Usakova, Mariana; Usak, Elemir; Dosoudil Rastislav, Lokaj jan: Magnetic Properties Analysis of Rare-Earth Substituted Nickel Zinc Ferrites. - **registered in: Web of Science** , Conference: 21st Conference on Soft Magnetic Materials (SMM) Location: Budapest, HUNGARY Date: SEP 01-04, 2013, Hungarian Acad Sci, Wignet Ctr Phys, Inst Solid State Phys; IEEE Magnet Soc IEEE TRANSACTIONS ON MAGNETICS Volume: 50 Issue: 4 Article Number: 2800304 Part: 1 Published: APR 2014

Lokaj Ján, Szabová Zuzana, Eduard Jakubcek, Barbara Odoklienková: Production of large area bimetals by exsplosion welding. 10th International Conference „Safety blasting techniques", Szyzyrk Poland, Date October 08-10, 2014.ISBN 978-83-61126-82-9, pp. 64-68

Martinkovič, Maroš - Minárik, Stanislav: Evaluation of grain deformation in polycrystals. - abstrakt článku v zborníku: Metallography´ 2013 : 15th International Symposium on Metallography. Slovak Republic, Stará Lesná, 24th - 26th April 2013. Abstract Booklet. - Košice : Technická univerzita v Košiciach, 2013. - ISBN 978-80-553-1412-9. - p. 98. - **registered in: Web of Science, Scopus.** In: Materials Science Forum. - ISSN 0255-5476. - Vol. 782 : Metallography´ 2013 : 15th International Symposium on Metallography. Slovak Republic, Stará Lesná, 24 - 26 April 2013. - , 2014, pp. 41-44.

Novák, Michal - Lofaj, František - Hviščová, Petra: The influence of indentation conditions on nanohardness depth profiles of W-C based coatings. - abstrakt článku v zborníku: Local Mechanical Properties 2013 : Book of Abstracts. 10th International Conference, 6. - 8. 11. 2013, Kutná Hora, Czech Republic. - Praha : Czech Technical University in Prague, 2013. - ISBN 978-80-01-05374-4. - S. 58. - APVV 0034-07, APVV 0520-10, Vega 2/0108/11. - **registered in: Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 606 : Local Mechanical Properties 2013, 10th International Conference, 6 – 8/11/2013, Kutná Hora, Czech Republic. - , 2014. - ISBN 978-3-03835-062-0, pp. 175-178.

Ondruška, Michal - Drienovský, Marián - Čička, Roman - Marônek, Milan - Náplava, Antonín: Optimizing the welding of plastics with the use of differential scanning calorimetry and thermogravimetric analysis. - **registered in: Scopus.** In: Acta Polytechnica. - ISSN 1210-2709. - ISSN 1805-2363. - Vol. 54, No. 3 (2014), pp. 221-224.

Opálek, Andrej - Iždinský, Karol - Nagy, Štefan - Simančík, František - Štefánik, Pavol - Kúdela, Stanislav: Microstructure and properties of composites prepared by reactive pressure infiltration of aluminium into metal and ceramic powder preforms. - EU FP7 Project, DO7RP-0008-11. - **registered in: Scopus.** In: Materials Science Forum. - ISSN 0255-5476. - Vol. 782 : Metallography´ 2013 : 15th International Symposium on Metallography. Slovak Republic, Stará Lesná, 24 - 26 April 2013. - , 2014, pp. 523-526.

Pašák, Matej - Čička, Roman - Bílek, Pavel - Jurči, Peter - Čaplovič, Ľubomír: Study of phase transformations in Cr-V tool steel. - **registered in: Master Journal List, Scopus.** In: Materiali in Tehnologije. - ISSN 1580-2949. - Vol. 48, Iss. 5 (2014), pp. 693-696.

Pešina, Zbyněk - Vykoukal, Vít - Palcut, Marián - Sopoušek, Jiří: Shear strength of copper joints prepared by low temperature sintering of silver nanoparticles. - **registered in: Web of Science, Master Journal List, Scopus.** In: Electronic Materials Letters [electronic source]. - ISSN 1738-8090. - Vol. 10, No. 1 (2014), online, pp. 293-298.

Sahul, Miroslav - Turňa, Milan - Sahul, Martin: Welding of dissimilar light metals by disk laser. - **registered in: Scopus.** In: Magnesium Technology 2014 : Proceedings of symposium sponsored by the Magnesium Comittee of Light Metals Division of the Minerals, Metals & Materials Society (TMS) held during TMS 2014. February 16 - 20, 2014, San Diego, California, USA. - California : TMS, 2014. - ISBN 978-1-118-88816-2. - pp. 301-305.

Sakhawat, Shahroz - Falahati, Ahmad - Degischer, Hans-Peter - Spiradek, K. - Dománková, Mária: Localized ageing in the heat affected zone of welded X5CrNiCuNb16-4 and X4CrNiSiTi14-7 sheets. - **registered in: Web of Science.** (In: IOP Conference Series: Materials Science and Engineering [elektronický zdroj]. - ISSN 1757-8981. - ISSN 1757-899X. - Vol. 60 : 13th International Symposium on Advanced Materials (ISAM), SEP 23-27, 2013, Islamabad, Pakistan. - , 2014, online, [9] p.

Veterníková, Jana - Degmová, Jarmila - Skarba, Michal - Petriska, Martin - Sojak, Stanislav - Slugeň, Vladimír: Study of structural inhomogeneity of commercial oxide-dispersion-strengthened steels. – **registered in: Scopus.** In: Journal of Physics: Conference Series. - ISSN 1742-6588. - ISSN 1742-6596. - Vol. 505, Iss. 1 : 13th International workshop on Slow Positron Beam Technigues and Applications, SLOPOS 2013, Munich, Germany 15 - 20 September 2013. - , 2014, art.no. 012017, [5] p.

F. Holka, M. Urban, P. Neogrády, J. Paldus, CCSD(T) Calculations of confined systems: In-crystal polarizabilities of F–, Cl–, O2-, and S2-. **registered in: Web of Science**. In: Journal of Chemical Physics Vol. 141, 214303 (2014).

Patents and Standards

Vazquez Villalabeitia, Manuel [pôvodca] - Kolesár, Vladimír [pôvodca]: Sensor de temperatura para sistemas microelectromecánicos y procedimiento de fabricación. - Madrid, 2014. - 16 p. p. - Número de solicitud: P201431530. Fecha de recepción: 16 octubre 2014. Oficina receptora: OEPM Madrid.

This part of Annual Report 2014 was verified by Prof. Ing. Jozef Janovec, DrSc. and Prof. Ing. Ľubomír Čaplovič, PhD.

INSTITUTE OF PRODUCTION TECHNOLOGIES

CONTACT

Director Prof. Ing. Koloman Ulrich, PhD.
e-mail: koloman.ulrich@stuba.sk
tel.: +421906068364

New management of the Institute since 01/12/2014

Director Prof. Ing. Peter Šugár, PhD.
e-mail: peter.sugar@stuba.sk
tel.: +421917367301

Address Jána Bottu 25, 917 24 Trnava, Slovak Republic
tel.: +421918646037
fax: +421906068499

STAFF

- Professors: 6
- Assoc. Professors: 12
- Senior Lecturers: 11
- Research Fellows: 7
- PhD Students: 31

EDUCATION AT THE INSTITUTE

Number of students (of 30/10/2014) enrolled in the study programmes offered by the Institute: **589**
Number of students graduated (in the academic year 2013/2014) from the study programmes offered by the Institute: **159**

STUDY PROGRAMMES

BACHELOR'S DEGREE:
- Computer-Aided Production Technologies
- Production Technologies

MASTER'S DEGREE:
- Machining and Assembly
- Computer-Aided Design and Production
- Welding
- Industrial and Art Casting

DOCTORAL DEGREE:
- Machine Technologies and Materials

ACTIVITIES OF THE INSTITUTE

Date	Title of event or activity at the Institute in 2014
24/4/2014	Interaction of technology of machining with production economics (Patrick De Vos – Manager of technical education in Seco Tools Group Company, Sweden)
26/5/2014	18th ESAB seminar on welding and weldability of materials
23/10/2014	Tool wear – practical models (Patrick De Vos – Manager of technical education in Seco Tools Group Company, Sweden)
3/ - 4/12/2014	Special applications and technologies in DMG MORI (STU, DMG MORI, SANDVIK, DELCAM)
30/10/2014	Visit of doc. Ing. Lachezar Stoev, CSc.- Technical University, Sofia, Bulgaria
19/11/2014	The optimisation of techniques and control programs for machining of non-rigid parts with a complex profile on CNC machines (Vladimir Puzanov, CSc. - Kalashnikov Izhevsk State Technical University, Russian Federation)
3/12/2014	Centrodes, Non-circular Gears and Polygonal Holes Boring (Professor Emeritus Milodrag Zlokolica,University of Novi Sad, Faculty of Technical Sciences, Serbia)

GRADUATE PROFILE

BACHELOR'S PROGRAMME (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 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 to apply computer technology for product and process design, programs for CNC machine tools, design of 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 particularly the field of chip and chipless machining and products assembly. The graduate will fully understands 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 of manufacturing process design.

Computer-Aided Design and Production
Graduates from the programme will be suitably training 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 in-depth 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 procedures 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 obtain the skills to evaluate the selection 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.

DOCTORAL 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 CAA systems
Assembly Theory
Atelier of Computer-Aided Design and Manufacturing I, II, III
Automation of Foundry Production
Bachelor Project
Bachelor Thesis
CA systems and Computer Simulation Processes
CAPP I, II
CAx technologies
CNC-machines Programming
Computer Aided Forming Technology
Computer Aided Productions Technologies I, II, III
Computer Aided Welding Technology
Design and Manufacturing of Welding Constructions
Dissertation Project I, II, III, IV, V, VI
Equipment for Foundry and Metal Casting
Experimental Methods in Machining
Finishing Methods of Machining
Forming Machines
Forming Technology
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
Metrology and CAQ Systems
Paedeutical Activity I, II, III, IV, V, VI
Planning of Welding Manufacture
Pre-degree Practice
Production Preparation in Foundry and Welding
Production Process Planning
Production Systems II
Professional Practice
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 - VII
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
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
Theory of Casting
Theory of Forming
Theory of Machining
Theory of Welding
Tribology
Welding Machines and Equipment
Welding Technology

GRADUATE THESES

List of theses contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Master's Theses

Stano, T.: Analysis of the deformation process in the cutting zone
Horváth, M.: Analysis of deformation process in the machined material
Bobok, R.: Analysis of machined surface after grinding
Manca, Š.: The analysis of cutting forces and torque in the drilling process
Jagerčík, M.: Analysis of welded joints of Mg alloy with the addition of RE produced by laser
Lisinovič, M.: Application of 3D printing to the manufacturing process for a small batch production
Vetrík, Ľ.: Numerical simulation aided precission forging of forged piece from light non-ferritic metal
Chranček, J.: Resistance spot welding of magnesium alloy AZ61
Satin, L.: CAE support of the thermoplastic injection moulding
Kuchár, J.: The database of parameters of 5-axis machine tool
Čapla, M.: Quality evaluation of clads based on the thickness, uniformity and integrity
Štibranyi, P.: The Appreciation of surface of the composite coats resistant to attrition
Palková, J.: The quality of machined surfaces at laser beam cutting
Lobodáš, M.: Laser surface structuring
Šišovský, M.: Laser micromachining
Grúber, R.: Measurement of surface roughness after milling with different cutting edge inclination angle
Greguš, R.: Measurement of cutting forces during milling when using tool with different cutting edge inclination angle
Matejovič, J.: Measurement of cutting forces during High Speed steel milling
Zaujec, R.: Methodology of geometry measuring of the shank cutting tools
Šurinová, R.: Modernization of a calliper by the use of linear guide
Babulík, A.: Design and optimization of the liquid cooled plate in simulation software Flotherm
Bagín, M.: Design and production of moulds for plastic injection
Štefula, D.: Design and production of glass moulds
Uhrinec, L.: Design and production of end mills with different helix angle
Križan, J.: Design and production of surface forming tool using computer aided forming
Triznová, J.: Design and production of the cutting insert chip breaker by laser micro machining
Jedlička, D.: Design of automated machine for resistance projection welding of screws
Konečná, L.: Design of Model and Manufacturing of University Ring by CAD/CAM software
Pikálek, P.: Proposal of the assembly process of screws into the ball pivot for BMW models
Vaľo, M.: Design of transfer device protype

Žilinčík, R.: Design of stabilizer for holding of sheet metal
Henčel, L.: Design of special tool for series parts production
Bohuš, R.: Design of technological process of series production components
Urban, P.: Design of the mining lamp body
Híreš, M.: Nonconventional methods of gear wheels machining
Drozd, J.: Ultrasonic machining of single crystal silicon
Ambruš, L.: Optimization of CMT welding parameters during welding of thin-walled tubes
Vyskoč, M.: Optimization of laser welding processes at PSA Trnava
Šmida, M.: Turning process optimalization of technological grooves on outer rings of bearings at INA SKALICA
Daučo, J.: Plasma cutting of free form welds
Beňák, F.: Computer aided design and manufacture of die forgings
Krčmárik, I.: Comparison of classical and modern ultrasonic control methods of welds
Vičík, V.: CNC Milling Technology and Rapid Prototyping Technology Manufactured Parts Comparison
Vidlička, J.: Surface remelting and alloying of high-speed steel using a laser
Gál, M.: Free Conture Programming in Heidenhain Control System
Hučka, J.: Rationalisation of production processes in the company
Sabo, L.: Reclamation of moulding sand with protein-based binder
Štefan, M.: Dimensions control of plastic pressings with camera assistance
Detony, Ľ.: Simulation of backward extrusion in DEFORM simulation software
Šebeň, P.: Investigate the effect of electrolyte concentration on the level of gloss with plasma polishing castings in the electrolyte
Janíková, K.: Investigation of the cutting fluids effect during aluminium alloy machining
Drlička, J.: Silicon brazing solders for higher application temperatures
Špányi, M.: Determination of butt-welded joints distortions with use of 3D scanning
Chmelíková, M.: Study of porosity in centrifugally casted alloys
Masaryková, R.: Study of the influences of the welding process parameters on the final quality of laser beam welded joints of thin-walled austenitic stainless steel AISI 316L
Pavlík, P.: Technology of thread manufacturing
Čulen, P.: Friction Stir Welding of highly solid steel used in the automobile industry
Remeš, N.: Creating of Extrusion Model and Construction of Injection Mould Design with Computer Aided Technologies
Schay, M.: Computer aided creation of tooling systems for complicated shape formed pieces
Polák, A.: The use of pipes and cores in the centrifugal casting of zinc castings
Hesko, P.: Modification of movable fixing equipment
Bestvina, R.: Modification of an injection mould in conditions of Pernoud Mould CE, Ltd.
Šilhár, J.: The impact of boriding process on the copy end mills wear
Jankovič, P.: The impact of boriding process on flat end mills wear
Urbanovič, L.: Effect of boriding process on the tool life of taps
Bunčiak, M.: Influence of the Milling Tool Geometry on Cutting Forces
Fekete, I.: Impact of protective atmosphere on the quality of laser welds from magnesium alloy AZ61
Ponca, M.: The influence of AZ 61 magnesium alloy welding parameters on the quality of welded joints
Gajdoš, M.: Impact of the width of cut on the cutting force during milling
Zahnaš, L.: Effect of pressure cutting fluid on the cutting tool wear
Dolnačko, M.: Research of new Zn-Al based solder alloys
Pavelek, Ľ.: The using of modern ultrasound methods for the duplex steel weld joint inspection
Struhár, F.: Use of computer aided tomography technology and Rapid Prototyping to the proposal of prothesis in biomedicine
Tóth, R.: Dependence of cutting tool wear from machining strategy
Vydra, P.: Dependence of cutting forces from machining strategy
Kučerák, P.: Changing the mechanical properties of the molding sands with a protein based binder for long-term storage
Nagy, M.: Solid State Welding of Heat Treatable Al Alloy by FSW Method
Mancoš, T.: Laser beam welding of aluminium components
Kákoš, J.: Welding of Magnesium Alloy AZ61 by disk laser
Ivánek, J.: Laser welding of hardenable Al 7075 alloy by using a filler material
Pirožák, J.: Welding of AZ 31 Mg alloy by disk laser
Tóthová, E.: Welding of thin stainless austenitic steel AISI 304 by solid state laser
Straka, J.: Hybrid Welding of Thin (Steel) Materials in Pulse Regimes
Mészároš, D.: Laser welding of thin zinc-coated steel sheets

PhD Theses
Marcian, Miroslav: Analysis of the damage and the repair welded storage tank
Enger, Marco: The Development of Tribologically Optimized Surfaces by Nanolayers and Strengthening Phases
Kleinedlerová, Ivana: Piercing in materials with abrasive water jet cutting
Hurajt, Marek: Study of electrolyte concentration influence on properties of electrolyte-plasma process during final surface treatment of stainless steel near-net-shape castings
Samardžiová, Michaela: Hardened steels turning by progressive Wiper tool
Dühring, Steven, Dipl.-Ing. (FH), PhD: Experimental-numerical method of the failure prediction by the heat treatment of steels
Kramár, Tomáš: Welding of magnesium alloys using selected welding technologies
Krampoťák, Peter: Study of the effect of laser welding parameters on the final properties of welded joints of austenitic thin walled stainless steels
Kupec, Tomáš: Welding of light alloys using the FSW method

Habilitation Theses:
Šugárová, Jana: The study of spun parts properties produced by conventional metal spinning – Trnava, STU in Bratislava MTF, 2014
Morovič, Ladislav: Design, machining, measuring and scanning of free form surfaces – Trnava, STU in Bratislava MTF, 2014

RESEARCH AT THE INSTITUTE

Areas of Research
- Production and measurement of complex-shaped surfaces,
- Laser and ultrasonic machining of difficult-to-machine materials,
- Numerical simulation and optimisation of sheet metal and bulk forming processes,
- Optimisation of CNC conventional metal spinning processes,
- Modification of surfaces of stainless steel with plasma discharge in electrolytes,
- Art casting,
- Classical and special methods of joining and cutting metallic and non-metallic materials,
- Surface Engineering and Tribology,
- Inoculation and modification of cast high-speed steels,
- Welding of duplex and super-duplex stainless steels,
- Non-destructive testing of welded joints,

All important and original results are presented by our Institute, at seminars and conferences at home and abroad, and are published in reviewed or non-reviewed scientific journals and in professional journals. The results from the research activities are transferred to the educational process within specific subjects and also as a part of Bachelor's, Master's and PhD programmes.

Research characteristics
Research at the Institute of Production Technologies is focused on industrial technologies with respect to research and development in the sphere of high-tech technologies. The main fields of industrial technologies at the Institute of Production Technologies are: machining, forming, casting and welding.

The scientific directions are determined for the long-term and cover the production and technological aspects in the industry and education.
Key directions of scientific research activity at the Institute of Production Technologies are focused on supporting the development of individual science and educational branches. In the frame of the specific responsibility, the Institute ensures personal and professional growth of all employees. The attention is devoted primarily to actual and prospective questions related to industrial technologies in the Slovak Republic, during this process provisions are also made for international trends, as well as the integration processes of the EU. The mark of scientific research work and activity is determined by originality of the scientific output of the teachers and scientific research employees in the Institute, the material output of the main workstations and the proposed solutions to scientific questions. The Institute of Production Technologies focuses on trans-regional pedagogic and scientific activities and also cooperates with many renowned scientific research institutes abroad. International co-operation in research is implemented mainly through the exchange of information, results, knowledge for education of PhD students (fellowships, educational visits, workshops).
The layout of the projects is focused primarily on production technologies in co-operation with industry in relation to the actual global problems.

Areas of expertise

- 5-axis Machining
- Application of Progressive Cutting Tools
- Art Casting
- CAD/CAM/CAE Systems
- Casting Processes
- Design for Manufacturing and Assembly
- Control of Quality in Welding
- Cutting Fluids Application, Monitoring and Maintenance
- Die Forging
- Engineering Metrology
- Formability of Materials
- Forming Machines and Tools
- Laser Machining and Welding
- Modelling and Simulation of Technological Processes
- Optical 3D Scanning
- Programming of NC Machines
- Progressive Methods of Machining and Welding
- Stereology
- Surface Engineering and tribology
- Testing of Materials
- Welded Structures
- Welding and soldering

PROJECTS OF THE INSTITUTE

Project Title **Technological heritability of the laser micromachining process and its influence on technological and exploitation properties of material.**
Coordinator Prof. Ing. Peter Šugár, CSc.
Start Date 01/01/2011
End Date 31/12/2014
Programme VEGA
Annotation The goal of the project is to research the laser micromachining process (laser micromilling and so called laser microstructuring) during machining of metals by solidstate Nd: YAG and ytterbium fiber laser. Two fields of interest are solved in this project. The first is the assignment of laserinduced surface degradation relevancy on changes in corrosion resistance of stainless steels and commercially pure titanium with the different degree of deformation strengthening (thin sheet plates made by technology of drawing and metal spinning). The second area of interest is to define optimal technological conditions of forming tools laser structuring with the goal to optimise the tribology conditions in the tool – workpiece interface.

Project Title **Research of weld joints properties of duplex and superduplex steels**
Coordinator Prof. Ing. Koloman Ulrich, PhD.
Start Date 01/10/2013
End Date 31/12/2016
Programme APVV
Annotation The project is focused on the basic research conditions and procedures for creating the weld joints by laser and electron beam in selected types of duplex stainless steels with a ferriticaustenitic structure. Concentrated energy sources, due to their flexibility, allow for the immediate application of preheating before the welding process and postheating after the welding process using a defocused or rasterised beam, which provides great research potential. The weldability of duplex and superduplex steels, the structural analysis and the tests of mechanical properties, as well as corrosion properties will be investigated at particular stages of the project. All processes of the technological network participate in creating the final properties of the product. For this reason, the experimental research programme will also cover the analysis of weld joints created from materials influenced by different types and levels of deformation, as well as the sheet forming of weld joints. A special focus will be devoted to finding the correlation between the crucial technological parameters of the process and the properties of the weld joint. The project has the aim to push the knowledge boundaries of the welding process of selected duplex stainless steels through the application of concentrated energy sources, such as laser and electron beam.

Project Title **Research of new soldering alloys for fluxless soldering with the application of beam technologies and ultrasound**
Coordinator doc. Ing. Roman Koleňák, PhD.
Start Date 01/10/2013
End Date 31/05/2017
Programme APVV
Annotation The project is oriented towards the research of environmentally friendly solder alloys and conditions of soldering with progressive technologies. The designed and experimentally manufactured solders will be used for the soldering of metallic and ceramic materials at higher application temperatures. To ensure the wettability of ceramic and hardtosolder materials, the solders will be alloyed with active elements and metals from the group of lanthanides. The tests of technological solderability of ceramic and metallic materials will be performed through the use of new soldering alloys for fluxfree soldering, with the application of laser technologies, power ultrasound and electron beam. The structural characteristics of solders and soldered joints will be studied under different soldering conditions. Interactions in the boundary of joined material and the solder will be investigated. Qualitative criteria of solderability such as wettability, spreadability, diffusion and erosion will be determined at standard and extreme soldering conditions for research to investigate the application conditions of soldering. The shear strength of soldered joints fabricated in metallic and ceramic materials will be determined.

Project Title **The implementation of blended learning principles into teaching the programming of CNC machine tools and devices with a progressive kinematic structure**
Coordinator Prof. Ing. Peter Šugár, CSc.
Start Date 01/01/2014
End Date 31/12/2016
Programme KEGA
Annotation The project is oriented on the unification of teaching procedures within the subject of Programming CNC machine tools and devices for various technology purposes, while focusing on the machine tools and devices with progressive kinematic structure and using the blended learning principles. The target group involves the students of all degrees levels, including postgraduate students and partially also the students of secondary technical schools. Besides defining a unified content structure of synchronous and asynchronous on-line education and preparing the conditions for face-to-face laboratory education of programming a wide scale of CNC production and measurement technology, the project also has the ambition to build a system for cooperation between education and production entities, with the aim to intensify information transfer in shaping the graduate profile in the field in accordance with the current demands of practice.

Project Title **An investigation of selected machining process characteristics by using HI-technologies of machining and their effect on the resulting quality of machined surfaces and trouble-free loading**
Coordinator doc. Ing. Peter Pokorný, PhD.
Start Date 01/01/ 2014
End Date 31/12/2017
Programme VEGA
Annotation The project is aimed at the investigation of selected characteristics of machining process (cutting forces, machining of thin-wall components, wear and restoration of the tool's cutting properties, cutting media and strategies of machining). The above-mentioned characteristics of machining affect the quality of parts. The project therefore investigates their effect on the resulting characteristics of components. In the process of investigation, the researchers will use Hi-technologies in the Centre of Excellence for 5-axis machining (high-speed machine tools, milling-ultrasound machine, laser machine, tool grinder). The required geometric and dimension precision of the fabricated component determine the conditions for assembly and thus also the result of the assembly process. The project will therefore elaborate a method of harmonising production technology with the requirements defined in the geometric specifications of products.

Project Title **Research into the defect diagnostic of welded joint through the use of modern NDT methods**
Coordinator Prof. Ing. Koloman Ulrich, PhD.
Start Date 01/01/ 2014
End Date 31/12/2016
Programme VEGA
Annotation The project aim is to research defect diagnostics of weld joints using modern ultrasonic methods TOFD and Phased Array (PA), compared with radiation methods and the impact of defects detected over the lifetime of welded structures. Samples of weld joints will be prepared with artificially created defects, in order to verify the sensitivity of UT techniques and the results of detected defects will be compared with classical and modern radiation methods. The methods TOFD and PA will be further applied to measurements in industrial practice for testing the welded joints of concrete. Control of the weld samples will be measured by the size of present defects on the calculated critical size defect and residual life of welded structures. Calculations will be transferred by shape coefficients for the presence of peripheral and internal defects. Comparing the results of the analysis and evaluation of measurement methods will be determined by inspection and accurate method of determining the size of immediate defects.

Project Title **Utilising advanced methods of optical 3D scanning for the analysis of weldments**
Coordinator Prof. Ing. Milan Marônek, CSc.
Start Date 01/01/ 2014
End Date 31/12/2016
Programme VEGA
Annotation To measure lengths and angles, current methods of measuring the weld joints deformations use simple manual gauges, mainly for financial reasons. When measuring free-form structures and a higher number of measurements, the process is time-consuming. Furthermore, results of the measurements are influenced by human factors. Besides architecture and reverse engineering, modern methods of 3D scanning are finding wider application in the field of technologies of machine production, e.g. in the automobile industry. The project will verify the suitability of the 3D scanning methods for determining the deformations occurring in welding. The project will also examine the effects of the scanning parameters on the resulting precision of measurement, suitability of individual scanning methods, depending on individual types of deformation and regarding geometric dimensions of the parts welded, welding technology used and its process parameters.

Project Title **Research and Development Centre in the field of electron-beam and progressive arc welding technologies, cladding and surface finishing**
Coordinator Prof. Ing. Milan Marônek, CSc.
Start Date 01/10/2012
End Date 30/09/2015
Programme OP VaV
Annotation The specific objectives of the project comprise modernisation and improvement of the technical infrastructure of research and development. The goal is to build a high-tech workplace for research of progressive welding technologies, surface hardening, remelting and depositing special layers by electron beam. Another goal is to build a top-class workplace for the complex research of technology of welding and cladding processes by using the methods of electric and plasma arcs welding in all welding positions and in any weld/clad trajectory.

Project Title **The technical infrastructure of research and development for the field of temperature gauging by the contact and non-contact methods of measurement**
Coordinator doc. Ing. Augustín Görög, PhD.
Start Date 01/10/2012
End Date 30/09/ 2014
Programme OP VaV
Annotation The strategic objective of the project is to build research and development workplaces oriented on the research of progressive welding technologies and on the increase of research potential in the field of engineering metrology by using advanced methods of measuring the precision of machine parts, and its integration into research and developments networks. The project output will have a positive impact on the development of the education process and the preparation of a new generation of researchers and qualified staff for high-tech industrial sectors. New machines and devices will provide favourable conditions for direct cooperation with practice, thus enabling effective transfer of research results into practice.

Project Title **The effect of 5-axis grinding parameters on the geometric precision of cutting tools with a shank**
Coordinator doc. Ing. Štefan Václav, PhD.
Start Date 01/01/2012
End Date 31/12/2014
Programme VEGA
Annotation The project will investigate the precision of grinding and the geometry of cutting tools with a shank by using a new method developed by the project authors. The theory of cutting forces in grinding is not sufficiently developed so far. The project output will be the application of the above-mentioned theory of highly parametric 3-axis grinding to 5-axis grinding. The project goal is also the verification of the tools produced by the researchers involved in the project on 5-axis milling machines, and subsequent measurement of their geometry prior to and after machining on both the Zoller 5-axis measuring machine and optical scanner.

Project Title **Building an on-line classroom for the dynamic education of secondary school and university students in the field of design and production of free-form parts**
Coordinator Prof. Dr. Ing. Jozef Peterka
Start Date 01/01/2012
End Date 31/12/2014
Programme KEGA
Annotation The project is focused on building an on-line classroom for the dynamic education of secondary school and university students, and the subsequent piloting of the on-line classroom for education of the wider public in the field of programming CNC machines and CAD/CAM systems, primarily for the accredited study programmes of Computer-aided Production Technologies (Bc.) and Computer-aided Design and Production (Master's degree) in STU MTF. The on-line classroom will provide dynamic education in two forms: 1/ on-line practical lectures and exercises in real time, 2/ on-line testing in real time. The on-line classroom with software and hardware support will help the full-time and part-time university students as well as allowing secondary technical school students to aquire the knowledge without physical contact and attendance to classes at STU MTF in Trnava. The contents of the pilot project will involve the fundamentals of programming CNC machines and CAD/CAM systems (design and production of parts). Complex materials (texts, presentations, multimedia videos, model examples) developed for the on-line classroom will be available on the Internet website for all potential target groups, including the students of all forms of study at STU MTF in Trnava, the training centre in Dubnica, as well as the students of other universities and secondary schools and the general public. The results will be applicable in the Slovak Republic and abroad.

Project Title **Industrial research of silenblocks for excessive loading at extreme temperatures in the field of industrial application**
Coordinator doc. Ing. Jozef Bílik, PhD.
Start Date 01/11/2011
End Date 01/10/2015
Programme OP VaV
Annotation The project is focused on building an on-line classroom for the dynamic education of secondary school and university students, and the subsequent piloting of the on-line classroom for education of the wider public in the field of programming CNC machines and CAD/CAM systems, primarily for the accredited study programmes of Computer-aided Production Technologies (Bc.) and Computer-aided Design and Production (Master's degree) in STU MTF. The on-line classroom will provide dynamic education in two forms: 1/ on-line practical lectures and exercises in real time, 2/ on-line testing in real time. The on-line classroom with software and hardware support will help the full-time and part-time university students as well as allowing secondary technical school students to aquire the knowledge without physical contact and attendance to classes at STU MTF in Trnava. The contents of the pilot project will involve the fundamentals of programming CNC machines and CAD/CAM systems (design and production of parts). Complex materials (texts, presentations, multimedia videos, model examples) developed for the on-line classroom will be available on the Internet website for all potential target groups, including the students of all forms of study at STU MTF in Trnava, the training centre in Dubnica, as well as the students of other universities and secondary schools and the general public. The results will be applicable in the Slovak Republic and abroad.

Project Title **Research into modified soldering alloys for the fluxless soldering of the metal and ceramic materials.**
Coordinator doc. Ing. Roman Koleňák, PhD.
Start Date 01/01/2014
End Date 31/12/2016
Programme VEGA
Annotation The project is focused on the research into modified soldering alloys, particularly those of the Sn-Ag-Ti, Sn-Ag-Cu and Zn-Ag-Al type. New soldering alloys with a small amount of active metals (In, Ga, Y and some elements of the group of lantanoids) will be experimentally prepared. Solders will be designed for fluxless soldering by using the technologies of laser and high-power ultrasound. The modified soldering alloys will be tested for technological solderability of ceramic and metallic materials, in order to determine the structure of the solders and solder joints under various conditions of soldering. Interactions between the soldered material and solder will be studied along with the mechanical properties of the soldered joints.

Project Title	**Research into the metallurgical joining and other technological processes of processing magnesium and other light alloys by progressive and suitable environment-friendly technologies**
Coordinator	Ing. Miroslav Sahul, PhD.
Start Date	01/01/2012
End Date	31/12/2014
Programme	VEGA
Annotation	The project is focus on: the design, experimental verification and scientific justification of technological processing of Mg alloys; the selection of progressive and environment-friendly technologies of metallurgical joining and forming; the welding and soldering/brazing of Mg alloys with other metals (Al, Ti, Steels); and the design and quality control of joints by using advanced non-destructive and destructive methods. A detailed study will be conducted of the interface of combined joints with the AZ91 and AZ31 alloys, thus contributing to the research into the mechanisms and their origin and participation into the development of a new Mg alloy of the ML5 type. The heat distribution will be investigated by concentrated energy sources and comparison with AWJC. Verification for the possible use of microplasma polishing of surfaces of the Mg and Al alloys will be made. The study will focus on the strain/stress- deformation states of materials in the processing of Mg and Al alloys (ISF, MS, Thixoforming) in order to optimise the parameters of forming processes and to predict the utility properties of products. The justification of the economic and environmental priorities of the individual technologies will also be provided.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

Country	Employee
Belarus	Čaus Alexander, Prof. Ing., DrSc.
Czech Republic	Baránek Ivan, Prof. Ing., CSc. Bílik Jozef, doc. Ing., PhD. Buranský Ivan, Ing., PhD. Görög Augustín, doc. Ing., PhD. Kováč Martin, Ing., PhD. Necpal Martin, Ing., PhD. Pokorný Peter, doc. Ing., PhD. Sahul Miroslav, Ing., PhD. Samardžiová Michaela, Ing., PhD. Šimna Vladimír, Ing., PhD. Šugár Peter, Prof. Ing., CSc. Šugárová Jana, doc. Ing., PhD. Tittel Viktor, doc. Ing., CSc. Václav Štefan, doc. Ing., PhD.
France	Beznák Matej, doc. Ing., CSc. Čaus Alexander, Prof. Ing., DrSc.
Republic of Korea	Bárta Jozef, Ing., PhD. Marônek Milan, Prof. Ing., CSc.
Hungary	Bárta Jozef, Ing., PhD. Hodúlová Erika, doc. Ing., PhD. Marônek Milan, Prof. Ing., CSc. Morovič Ladislav, doc. Ing., PhD. Šugár Peter, Prof. Ing., CSc. Ulrich Koloman, Prof. Ing., PhD.
Germany	Baránek Ivan, Prof. Ing., CSc. Buranský Ivan, Ing., PhD. Hodúlová Erika, doc. Ing., PhD. Kováč Martin, Ing., PhD. Necpal Martin, Ing., PhD. Pokorný Peter, doc. Ing., PhD. Samardžiová Michaela, Ing., PhD. Šimna Vladimír, Ing., PhD. Šugárová Jana, doc. Ing., PhD.
Poland	Hodúlová Erika, doc. Ing., PhD. Martinkovič Maroš, doc. Ing., PhD. Morovič Ladislav, doc. Ing., PhD. Šugár Peter, Prof. Ing., CSc. Šugárová Jana, doc. Ing., PhD.
Austria	Moravčíková Jana, Ing., PhD.
Russia	Pokorný Peter, doc. Ing., PhD. Sahul Miroslav, Ing., PhD. Václav Štefan, doc. Ing., PhD.
USA	Sahul Miroslav, Ing., PhD.
Switzerland	Hodúlová Erika, doc. Ing., PhD. Kovaříková Ingrid, Ing., PhD.
Italy	Šugár Peter, Prof. Ing., CSc. Šugárová Jana, doc. Ing., PhD.

.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Slovak Welding Society
Prof. Ing. Koloman Ulrich, PhD.
Prof. Ing. Milan Marônek, CSc.
Prof. Ing. Milan Turňa, PhD.
doc. Ing. Pavel Kovačócy, PhD.
doc. Ing. Roman Koleňák, PhD.
doc. Ing. Erika Hodúlová, PhD.
Ing. Ingrid Kovaříková, PhD.
Ing. Ladislav Pavlovič
Ing.Vladimír Púčik

Slovak Society of Tribology
doc. Ing. Erika Hodúlová, PhD.
Ing. Ingrid Kovaříková, PhD.
doc. Ing. Ladislav Morovič, PhD.

Slovak Foundry Society
doc. Ing. Matej Beznák, PhD.

Slovak Associations of Steel Constructions
Prof. Ing. Koloman Ulrich, PhD.

Slovak Chamber of Commerce and Industry – Section of Production Machines and Equipment
Prof. Ing. Ivan Baránek, PhD.

Slovak Metal Science Society
Prof. Ing. Ivan Baránek, PhD.
Prof. Ing. Peter Šugár, CSc.
Prof. Ing. Milan Marônek, CSc.
doc. Ing. Jozef Bílik, PhD.
doc. Ing. Mária Kapustová, PhD.
doc. Ing. Roman Koleňák, PhD.
doc. Ing. Maroš Martinkovič, PhD.
doc. Ing. Viktor Tittel, CSc.
Ing. Róbert Sobota, PhD.
Ing. Jana Šugárová, PhD.

Slovak Metrology Society
doc. Ing. Augustín Görög, PhD.

Technical Standard Committee
Prof. Ing. Koloman Ulrich, PhD.

First Welding Company, Inc.
Prof. Ing. Koloman Ulrich, PhD.

Slovak Institute of Technological Normalization – TK 76 Corrosion and Material Protection against Corrosion
doc. Ing. Štefan Václav, PhD.
doc. Ing. Peter Pokorný, PhD.

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

International Institute of Welding
Prof. Ing. Koloman Ulrich, PhD.
Prof. Ing. Milan Marônek, CSc.
doc. Ing. Erika Hodúlová, PhD.
Ing. Ingrid Kovaříková, PhD.

American Welding Society
Prof. Ing. Milan Turňa, EWE PhD.

Czech Welding Society
Prof. Ing. Milan Turňa, PhD.

Czech Society for New Materials and Technologies
doc. Ing. Pavel Kovačócy, PhD.

International Journal of Advances in Machining and Forming Operations
Prof. Ing. Alexander Čaus, DrSc.

Trenie i Iznos (Friction and Wear)
Prof. Ing. Alexander Čaus, DrSc.

PUBLICATIONS (MOST IMPORTANT PUBLICATIONS IN 2014)

List of publications contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Chaus, Alexander - Porubský, Ján: Effect of Heat Treatment on the Structure of Cast High-Speed Steel of Type R6M5 Modified with Tungsten Additives. – **registered in: Web of Science, Master Journal List, Scopus.** In: Metal Science and Heat Treatment. - ISSN 0026-0673. - Vol. 55, Iss. 11-12 (2014), pp. 583-591.

Chaus, Alexander: Effect of room-temperature compression on microstructure of ductile cast iron subjected to hot plastic deformation. - Originál ruský text článku publikovaný v časopise Fizika Metallov i Metallovedenie, 2014, Vol. 115, No. 7, pp. 716-726. – **registered in: Web of Science, Master Journal List, Scopus.** In: Physics of metals and metallography. - ISSN 0031-918X. - Vol. 115, iss. 7 (2014), pp. 672-681.

Chaus, Alexander: Microstructural and properties evaluation of M2 high speed steel after inoculating addition of powder W and WC. – **registered in: Web of Science, Master Journal List, Scopus.** In: Materials Science and Technology. - ISSN 1743-284(E). - ISSN 0264-0836(P). - Vol. 30, Iss. 9 (2014), pp. 1105-1115.

Chaus, Alexander - Fedosenko, Tatiana N. - Rogachev, Alexander V. - Čaplovič, Ľubomír: Surface, microstructure and optical properties of copper-doped diamond-like carbon coating deposited in pulsed cathodic arc plasma. – **registered in: Web of Science, Master Journal List, Scopus.** In: Diamond and Related Materials. - ISSN 0925-9635. - Vol. 42 (2014), pp. 64-70.

Novák, Igor - Popelka, Anton - Valentín, M - Chodák, Ivan - Špírková, Milena - Tóth, András - Kleinová, Anna - Sedliačik, Ján - Lehocký, M. - Marônek, Milan: Surface behavior of polyamide 6 modified by Barrier plasma in oxygen and nitrogen. – **registered in: Web of Science, Master Journal List, Scopus.** In: International Journal of Polymer Analysis and Characterization [elektronický zdroj]. - ISSN 1023-666X (P). - ISSN 1563-5341(E). - Vol. 19, iss. 1 (2014), online, pp.31-38.

Baránek, Ivan - Buranský, Ivan: Teaching approaches to free-form surfaces design and manufacturing. – **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, p. 3-8.

Baránek, Ivan: Trends in cutting materials and tools for hard machining. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 236-241.

Božek, Pavol - Pokorný, Peter: Analysis and evaluation of differences dimensional products of production system. - **registered in: Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 611 (2014), pp. 339-345.

Božek, Pavol - Pokorný, Peter: Automatic system for object recognition in robotic production line for automotive industry. - **registered in: Scopus.** In: Mechatronics 2013: 10th International conference. 7 - 9 October 2013, Brno, Czech Republic. - Cham: Springer International Publishing, 2014. - ISBN 978-3-319-02293-2. - pp. 653-662.

Buranský, Ivan - Peterka, Jozef - Buranská, Eva: On-line classroom for dynamic education. – **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 15-20.

Gerulová, Kristína - Buranská, Eva - Tatarka, Ondrej - Szabová, Zuzana: Preliminary Study of Ozone Utilization in Elimination of Bacterial Contamination in Metalworking Fluids. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 581. Precision Machining VII: 7th International Congress of Precision Machining (ICPM 2013), October 3 - 5, 2013, Miskolc, Hungary. - Durnten-Zurich: Trans Tech Publications, 2014. - ISBN 978-3-03785-840-0, pp. 143-147.

Hodúlová, Erika - Šimeková, Beáta - Kovaříková rod. Sukubová, Ingrid - Lechovič, Emil - Ulrich, Koloman: Research and development of lead-free solder for microelectronics in consideration of the environmental andf qualitative aspects. - **registered in: Master Journal List, Scopus.** In: Welding in the World. - ISSN 0043-2288. - Vol. 58, No. 5 (2014), pp. 719-727.

Hricová, Júlia - Kováč, Martin - Šugár, Peter: Eksperimentalno istraživanje brzog glodanja aluminijske legure. - **registered in: Web of Science, Master Journal List, Scopus.** In: Tehnički Vjesnik - Technical Gazette. - ISSN 1330-3651. - Vol. 21, Iss. 4 (2014), pp. 773-777.

Chaus, Alexander - Beznák, Matej - Šuba, Roland - Bajčičák, Martin: Diffusion induced changes in eutectic carbides in inoculated M2 high-speed steel at austenitising. - **registered in: Scopus.** In: Defect and Diffusion Forum. - ISSN 1012-0386 (E). - ISSN 1662-9507 (P). - Vol. 353 : 9th International Conference on Diffusion in Solids and Liquids Mass Transfer - Heat Transfer - Microstructure and Properties

- Nanodiffusion and Nanostructured Materials, DSL 2013, Madrid, Spain, 24-28/06/2013 (2014), pp. 61-66.

Jáňa, Miroslav - Turňa, Milan - Ožvold, Milan: Design of binary zinc-based solder for joining Mg alloy type AZ 31B. - **registered in: Scopus.** In: Magnesium Technology 2014: Proceedings of symposium sponsored by the Magnesium Comittee of Light Metals Division of the Minerals, Metals & Materials Society (TMS) held during TMS 2014. February 16 - 20, 2014, San Diego, California, USA. - California: TMS, 2014. - ISBN 978-1-118-88816-2. - pp. 307-310.

Koleňák, Roman - Martinkovič, Maroš: Determination of Mechanical Properties of Active Solder Alloys using the Measuring Method "Small Punch Test". - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 586: The 9th International Conference "Local Mechanical Properties" (LMP 2012), 7 - 9 November 2012 Levoča, Slovak Republic. - , 2014, pp. 174-177.

Koleňák, Roman - Kostolný, Igor - Čička, Roman: Research of fluxless soldering of high-purity aluminium with solders type Zn-Al. - **registered in: Scopus.** In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 905. - , 2014, pp. 132-136.

Koleňák, Roman - Martinkovič, Maroš: Shear strength of joints fabricated by solders with high indium content. - abstrakt článku v zborníku: Metallography´ 2013 : 15th International Symposium on Metallography. Slovak Republic, Stará Lesná, 24th - 26th April 2013. Abstract Booklet. - Košice: Technická univerzita v Košiciach, 2013. - ISBN 978-80-553-1412-9. - S. 131. - **registered in: Web of Science, Scopus.** In: Materials Science Forum. - ISSN 0255-5476. - Vol. 782: Metallography´ 2013: 15th International Symposium on Metallography. Slovak Republic, Stará Lesná, 24 - 26 April 2013. - , 2014, pp. 461-464.

Kováč, Martin - Peterka, Jozef: Selected 5-axis strategies for high-speed milling of thin-walled parts. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 467 : 2013 International Conference on Materials Science and Mechanical Engineering (ICMSME 2013), Kuala Lumpur, Malaysia, 27 - 28 October 2013 - ISBN 978-303785949-0, pp. 466-469.

Kramár, Tomáš - Kolařík, Ladislav - Kolaříková, Marie - Sahul, Martin - Pospíšil, David: Capacitor discharge welding of aluminium studs. - **registered in: Scopus.** In: Manufacturing technology [elektronický zdroj]. - ISSN 1213-2489. - Vol. 14, No. 2 (2014), online, pp. 199-206.

Kupec, Tomáš - Behúlová, Mária - Turňa, Milan - Sahul, Miroslav: Friction stir welding of magnesium alloy type AZ 31. - **registered in: Scopus.** In: Magnesium Technology 2014: Proceedings of symposium sponsored by the Magnesium Comittee of Light Metals Division of the Minerals, Metals & Materials Society (TMS) held during TMS 2014. February 16 - 20, 2014, San Diego, California, USA. - California: TMS, 2014. - ISBN 978-1-118-88816-2. - pp. 311-315.

Martinkovič, Maroš - Václav, Štefan: Estimation of Local Plastic Deformation of Polycrystalline Materials. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 586: The 9th International Conference "Local Mechanical Properties" (LMP 2012), 7 - 9 November 2012 Levoča, Slovak Republic. - , 2014, pp. 39-42.

Martinkovič, Maroš - Minárik, Stanislav: Evaluation of grain deformation in polycrystals. - abstrakt článku v zborníku: Metallography´ 2013: 15th International Symposium on Metallography. Slovak Republic, Stará Lesná, 24th - 26th April 2013. Abstract Booklet. - Košice: Technická univerzita v Košiciach, 2013. - ISBN 978-80-553-1412-9. - pp. 98. - **registered in: Web of Science, Scopus.** In: Materials Science Forum. - ISSN 0255-5476. - Vol. 782: Metallography´ 2013: 15th International Symposium on Metallography. Slovak Republic, Stará Lesná, 24th - 26th April 2013. - , 2014, pp. 41-44.

Martinkovič, Maroš - Pokorný, Peter - Bodišová, Petra: Influence of drill wear to local plastic deformation in the wall of drilling hole. - **registered in: Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 606: Local Mechanical Properties 2013, 10th International Conference, 6. - 8. 11. 2013, Kutná Hora, Czech Republic. - , 2014. - ISBN 978-3-03835-062-0, p. 77-80.

Morovič, Ladislav - Vagovský, Juraj - Buranský, Ivan: Shape investigation of worn cutting inserts with utilization of active triangulation. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 581. Precision Machining VII: 7th International Congress of Precision Machining (ICPM 2013), October 3 - 5, 2013, Miskolc, Hungary. - Durnten-Zurich: Trans Tech Publications, 2014. - ISBN 978-3-03785-840-0, pp. 22-25.

Ondruška, Michal - Drienovský, Marián - Čička, Roman - Marônek, Milan - Náplava, Antonín: Optimizing the welding of plastics with the use of differential scanning calorimetry and thermogravimetric analysis. - **registered in: Scopus.** In: Acta Polytechnica. - ISSN 1210-2709. - ISSN 1805-2363. - Vol. 54, No. 3 (2014), pp. 221-224.

Peterka, Jozef - Pokorný, Peter: Influence of the Lead Angle from the Vertical Axis Milling on Effective Radius of the Cutter. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 581. Precision Machining VII: 7th International Congress of Precision Machining (ICPM 2013), October 3 - 5, 2013, Miskolc, Hungary. - Durnten-Zurich: Trans Tech Publications, 2014. - ISBN 978-3-03785-840-0, pp. 44-49.

Sahul, Miroslav - Turňa, Milan - Sahul, Martin: Welding of dissimilar light metals by disk laser. - **registered in: Scopus.** In: Magnesium Technology 2014: Proceedings of symposium sponsored by the Magnesium Comittee of Light Metals Division of the Minerals, Metals & Materials Society (TMS) held during TMS 2014. February 16 - 20, 2014, San Diego, California, USA. - California: TMS, 2014. - ISBN 978-1-118-88816-2. - pp. 301-305.

Samardžiová, Michaela - Kováč, Martin - Necpal, Martin: Contact measurement of flatness of parts with low rigidity. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 581. Precision Machining VII: 7th International Congress of Precision Machining (ICPM 2013), October 3 - 5, 2013, Miskolc, Hungary. - Durnten-Zurich: Trans Tech Publications, 2014. - ISBN 978-3-03785-840-0, pp. 437-442.

Samardžiová, Michaela - Neslušan, Miroslav: Roughness improvement in hard turning when changing cutting parameters and using differently shaped ceramic tools. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 345-350.

Šimeková, Beáta - Kovaříková rod. Sukubová, Ingrid - Hodúlová, Erika: Research of Cladded Layers Structures Changes Created by Laser Beam Technology Using a Wire Filler Material. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 442 : 3rd International Conference on Computer-Aided Design, Manufacturing, Modeling and Simulation (CDMMS 2013), Chongqing, China, 21 - 23 September 2013. - , 2014. - ISBN 978-303785901-8, pp. 9-12.

Šugár, Peter - Šugárová, Jana - Petrovič, Ján: Surface integrity of metal spun parts. – **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 581. Precision Machining VII: 7th International Congress of Precision Machining (ICPM 2013), October 3 - 5, 2013, Miskolc, Hungary. - Durnten-Zurich: Trans Tech Publications, 2014. - ISBN 978-3-03785-840-0, pp. 391-396.

Parts of Books

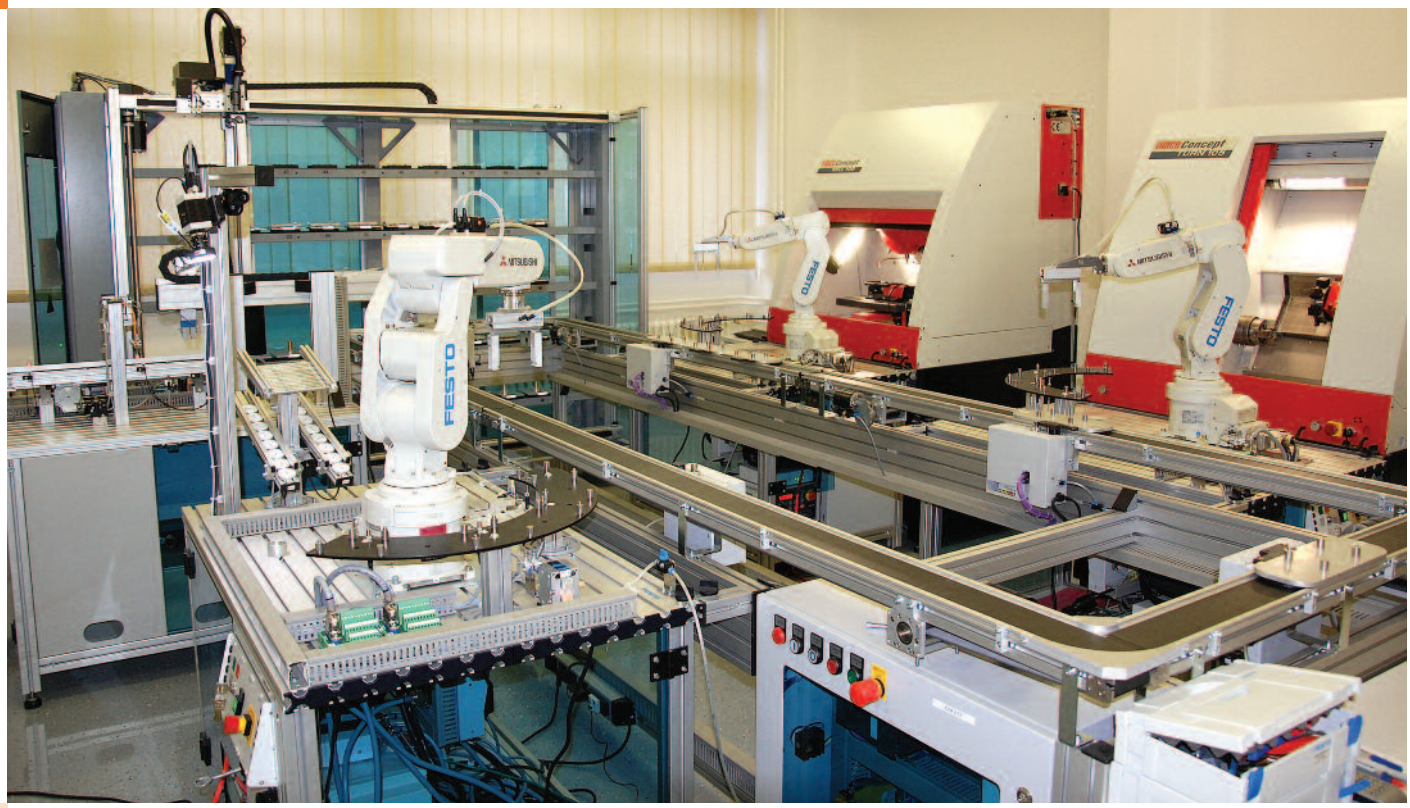
Šugár, Peter - Necpal, Martin - Šugárová, Jana - Görögová, Ingrid: Microgeometry of laser machined surfaces. In: Development in machining technology: Scientific - Research Reports, Vol. 4. - Krakow: Krakow University of Technology, 2014. - ISBN 978-83-7242-765-6. - pp. 212-219.

Patents and Standards

Božek, Pavol [author] - Pokorný, Peter [author] - Pivarčiová, Elena [author] - Nikitin, Ju. R. [author] - Halenár, Igor [author] - Šimák, Vojtech [author] - Pirnik, Rastislav [author] - Horváth, Dušan: Systém autonómnej kontroly trajektórie robota (System of autonomous control of a robot's trajectory). - Banská Bystrica: Úrad priemyselného vlastníctva SR (SR Office of Industrial Property), 2014. – Date of application: 14/04/2014.

This part of Annual Report 2014 was verified by Prof. Ing. Koloman Ulrich, PhD. and Prof. Ing. Peter Šugár, PhD.

INSTITUTE OF PRODUCTION SYSTEMS AND APPLIED MECHANICS



CONTACT

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

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

STAFF

- Professors: 1
- Assoc. Professors: 5
- Senior Lecturers: 12
- Research Fellows: 5
- PhD Students: 4

EDUCATION AT THE INSTITUTE

Number of students (at 30/10/2013) registered on study programmes offered by the Institute: **197**
Number of students graduated in the academic year 2013/2014 from the study programmes offered by the Institute: **53**

STUDY PROGRAMMES

- Production Devices and Systems

ACTIVITIES OF THE INSTITUTE

Date	Title of event or activity at the Institute in 2014
11-12/2014	In cooperation with "Trans Tech Publication": issuing of the Journal "Applied Mechanics and Materials", special issue "Novel Trends in Production Devices and Systems II", editors Daynier Rolando Delgado Sobrino, Karol Velíšek, Peter Košťál

GRADUATE PROFILE

BACHELOR'S PROGRAMME (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 opportunities 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

3D modelling and verification of computer models
Applied Mechanics
Assembly Machines
Bachelor's Project
Bachelor's Thesis
Computer Aided Design I, II, III
Cutting Tools
Design of Production Systems
Diploma Thesis
Dissertation project I-VI
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 Robots and Manipulators
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
Mechatronic systems
Modelling of Thermal Processes
Noise and Vibration
Pedagogic activities I-VI
Performance of Production Systems
Production Devices
Production Systems I
Professional Practice
Programming of Production and Manipulating Devices
Reliability and Safety of Technical Systems
Research paper I-VII
Technological Process Modelling and Simulation
Theory of Automatic Machines
Theory of Systems and Automatic Machines

GRADUATE THESES

List of theses contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Master's Theses
Matúš, Ľ.: Automation of manual installer workplace RSEMB
Kolena, M.: Inter-operational transport in production area of manufacturing company INA Skalica, Ltd.
Kubala, I.: Design and technical implementation of improvements specific ABL
Prištic, M.: Design for automatic manipulation station
Hlavanda, P.: The design of automation process for marking wooden hammers
Hudy, E.: Design of automation production car body subassemblies
Tolarovič, M.: Design of an automated assembly department for assembly of the selected product
Chvaščák, M.: New design concept of automatic assembly line for production of VW Tiguan sunvisors
Šulko, A.: Gripper design for robotized assembly workplace for manual assembly elimination
Hudecová, D.: Proposal for a flexible fixture for components measured Coordinate Measuring Machine
Polčová, M.: Proposal for special-purpose assembly machine for assembling of product „Barrier net" in company Johnson Controls International
Petrák, L.: The design of glue equipment with automatic glue supply in INA Skalica, s.r. o.
Janík, J.: Proposal of a semi-automated station for pre-assembly of gas valves
Nádaský, D.: Proposal for additional lighting and shading in the mounting station with camera control system iCIM

Dananaiová, B.: Servomotor management and the tasks for servomotor phasing for servomotor belt drive SMC
Margušová, S.: Design of a robotised assembly station
Jurigová, M.: Proposal technology repairs of machine components by the kinds of depreciation
Margetiny, M.: Tasks design realized in virtual software RobotStudio and its verification in real interface by industrial robot IRB 120
Holík, M.: The design of a universal lathe
Krivý, M.: Design and visualization of motion control of industrial robot IRB-120
Ďurkovič, M.: Design of performance parameters of the welding device for production of combined welded joints
Pressel, M.: Design of interchangeable jaws for pneumatic lathe chuck on CNC lathe EMCO Concept Turn 105
Režný, M.: Design of replaceable jaws for the pneumatic clamp on CNC Milling machine EMCO Concept MILL 105
Oravcová, E.: Design of training system for execution of tensiometric measurements of basic stress methods
Birkuš, D.: Design of machine for testing interior car parts
Kurová, M.: Proposal for changes implemented in assembly station with camera control on the basis of a new component base
Viktorová, V.: Optimalization of the material flow in the assembly of the door panels of the motor car Hyundai
Tomáška, J.: Design of production systems on thermoforming
Varga, R.: Tracing and prediction of moving objects trajectory and following movement control of humanoid robot
Rovenský, D.: Eligibility of the universal machine in accordance with the methodology AIAG
Damaškovič, P.: Components base for the production system and iCIM
Bašnák, M.: Specification of the component base for the CNC milling machine EMCO Concept MILL 105
Hošták, R.: The specification of component basis for the production system iCIM 3000 of the company FESTO
Kupkovičová, N.: Creation of kinematic mechanisms involving CAD
Kostolanský, M.: Determination of the Modal Characteristics of the Structure Using the PULSE System
Černák, M.: Visualization, monitoring and rating of production system with support technical software TIG
Nádaský, M.: Effect of shape and dimensions of the jaw manipulator on stress-strain state of components
Miterková, M.: Weibull analysis of data reliability and maintenance
Horváthová, P.: Implementation of New Parts into Production in the iCIM Production System
Vatrt, P.: Determination of sliding couple friction factor depending of dimension and course of sliding speed

PhD Theses
Delgado Sobrino, Daynier Rolando: Contributions to the design and analysis of the material flow in the context of manufacturing supported by the use of simulation
Čičmancová, Lenka: Design of systems for ultrasonic assisted machining
Kusá, Martina: Effect of inaccuracy of industrial robot during production of components with non-rotational shapes

RESEARCH AT THE INSTITUTE

Areas of Research
- intelligent workpiece clamping,
- intelligent assembly,
- intelligent assembly systems,
- thematic network on manufacturing technologies,
- new concepts of integrated multifunction manufacturing systems,
- 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's 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,
- Modelling, analyses and simulations of mechanical systems and machine aggregates,
- Mechatronical principle application for production devices,
- Methods of diagnostics and identification,
- Mechanical systems reliability,
- Vibrations, acoustics and biomechanics,
- Determination of cooling characteristics for heat treating media,
- Mechanical, thermal, fluid and other analyses for mechanical parts of machine and structures,
- Modelling, numerical simulations, analyses and optimisation for processes of forming, welding, casting and heat treatment.

At the Institute, the following laboratories are currently in operation: The Laboratory of Flexible Manufacturing Systems with robotised manipulation supported by drawing - free production, The Laboratory of Robotics, the Virtual Laboratory of Pneumatics and Electro-pneumatics Systems, the Laboratory of Pneumatics, the FESTO Laboratory, the Laboratory of CAD 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 joint Laboratory of Thermophysical Measurement and Computation.

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 automatizácia spol. s r.o. Bratislava; ZF Sachs Slovakia, a.s. Trnava; TOMA INDUSTRIES spol. s r.o. Trnava; ŽOS, a.s. Trnava; INA Skalica, spol. s r.o. Skalica; VUJE, a.s. Trnava; EBO Slovenské elektrárne, a.s. Jaslovské Bohunice; JAVYS, a.s. Jaslovské Bohunice; AllDeco, spol. s r.o. Jaslovské 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 Poznaň, VUT Brno, TU Budapest, UTB Zlín, VŠB Ostrava, TU Brašov, TU Chemnitz, ZČU 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 Heating
- Structural Analyses in the Area of Nuclear Energy
- Thermal Analyses, Measurement of Thermophysical Properties
- Production Technology
- Production Systems

PROJECTS OF THE INSTITUTE

Project Title	**The analysis of nonequilibrium thermal, metallurgical and stressstrain processes in production technologies involving rapid cooling and solidification of metallic materials**
Coordinator	doc. RNDr. Mária Behúlová, CSc.
Start Date	01/01/2011
End Date	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 investigation, numerical simulation and analysis of nonequilibrium thermal, metallurgical and stressstrain processes in technologies for the preparation of rapidly solidified powders using inert gas atomisation of melt, material forming in 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 and mechanisms of metastable structures development in the highalloyed materials on the base of iron and aluminium.

Project Title	**Research into the possibilities of "intelligence" implementation in the assembly process**
Coordinator	doc. Ing. Peter Košťál, PhD.
Start Date	01/01/2012
End Date	31/12/2014
Programme	VEGA
Annotation	The intelligent assembly paradigm includes a new approach to assembly system structure design. For 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 the environment changes. Results of these flexible reactions are a smaller layout space through decreasing the production and investment costs and by increasing productivity.

Project Title:	**Education for practice: Virtual Commissioning as a future technology tool for virtual implementation of production systems into automobile production within the "Digital Company" concept**
Coordinator:	Ing. Roman Ružarovský, PhD.
Type:	-- other domestic --
State:	in progress
Date from:	01/11/2014
Date to:	31/07/2015
Annotation:	The project is focused on the primary education of the young STU MTF UVSM teachers and students with the aim of increasing their knowledge, technology and practical levels, with the emphasis on devising and virtual implementation of the robotic, production and assembly systems in the automobile industry.

Project Title:	**Building a virtual laboratory of robotics and manipulation technology**
Coordinator:	Prof.h.c. Prof. Ing. Karol Velíšek, CSc.
Type:	KEGA
State:	in progress
Date from:	01/01/2014
Date to:	31/12/2016
Identification:	027STU-4/2014
Annotation:	The aim of the project is to build a laboratory with a set of training modules in the field of automation and industrial robotics, for the purposes of teaching the principles of automatic control of manipulation technology and programming of industrial robots, which are currently introduced in industrial practice. The laboratory will enable the building of student knowledge in the field of automated and robotised systems by using the innovative educational programme and methods along with modern CA technologies including e-learning. The laboratory will enable various application tasks to be dealt with, using various automation means and several control levels, including simulation and subsequent verification on real industrial components.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

Country	Employee
Czech Republic	Behúlová Mária, doc. RNDr., CSc. Bučányová Marcela, Ing., PhD. Ďuriš Rastislav, Ing., PhD. Holubek Radovan, Ing., PhD. Naď Milan, doc. Ing., CSc. Ružarovský Roman, Ing., PhD. Velíšek Karol, Prof.h.c. Prof. Ing., CSc. Vetríková Nina, Ing., PhD.
Hungary	Košťál Peter, doc. Ing., PhD.
Mexico	Babalová Eva, Ing. , PhD. Behúlová Mária, doc.RNDr. , CSc.
Germany	Ružarovský Roman, Ing., PhD. Velíšek Karol, Prof.h.c. Prof. Ing., CSc.

Country	Employee
Oman	Behúlová Mária, doc. RNDr., CSc.
Poland	Holubek Radovan, Ing., PhD. Košťál Peter, doc. Ing., PhD. Pecháček František, doc. Ing., PhD. Ružarovský Roman, Ing., PhD. Sobrino Delgado Daynier Rolando, Ing. PhD. Velíšek Karol, Prof.h.c. Prof. Ing., CSc.
Romania	Ružarovský Roman, Ing., PhD. Velíšek Karol, Prof.h.c. Prof. Ing., CSc.
Serbia	Košťál Peter, doc. Ing., PhD. Pecháček František, doc. Ing., PhD.

.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Slovak Acoustical Society
doc. Ing. Milan Naď, PhD.
Ing. Tibor Nánasi, PhD.

Slovak Welding Society
Ing.Helena Kraváriková, PhD.
Ing. Jarmila Oravcová, PhD.

Technical Commission 21 SÚTN Bratislava
doc. Ing. Milan Naď, PhD.
Ing. Tibor Nánasi, PhD.

Slovak Associations of Mechanical Engineers (SASI)
Prof. h. c. Prof. Ing. Karol Velíšek, CSc.
doc. Ing. Peter Košťál, PhD.
doc. Ing. František Pecháček, PhD.
Ing. Radovan Holubek, PhD.
Ing. Roman Ružarovský, PhD.

Expert Group for Chemistry and Physics of Solids
doc. RNDr. Mária Behúlová, CSc.

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

Society of Machining and Machine Tools
Prof. h. c. Prof. Ing. Karol Velíšek, CSc.
doc. Ing. Peter Košťál, PhD.
doc. Ing. František Pecháček, PhD.
Ing. Marcela Bučányová, PhD.

OIAV - ÖSTERREICHISCHER INGENIEUR - UND ARCHITEKTEN – VEREIN
Prof. h. c. Prof. Ing. Karol Velíšek, CSc.

WASET - World Academy of Science, Engineering and Technology - Scientific Committee and Editorial Review Board
Prof. h. c. Prof. Ing. Karol Velíšek, CSc.
doc. Ing. Peter Košťál, PhD.
Ing. Nina Danišová, PhD.
Ing. Roman Ružarovský, PhD.

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

European Acoustical Association
Ing. Tibor Nánasi, PhD.
doc. Ing. Milan Naď, PhD.

Central Europe Association for Computational Mechanics
Ing. Tibor Nánasi, PhD.
doc. Ing. Milan Naď, PhD.
Ing. Rastislav Ďuriš, PhD.

IACSIT - International Association of Computer Science and Information Technology
doc. Ing. Peter Košťál, PhD.
doc. RNDr. Mária Behúlová, PhD.
Ing. Andrea Mudriková, PhD.

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

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

PUBLICATIONS (MOST IMPORTANT PUBLICATIONS IN 2014)

List of publications contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Behúlová, Mária - Mesárošová, Jana - Grgač, Peter: Analysis of the influence of the gas velocity, particle size and nucleation temperature on the thermal history and microstructure development in the tool steel during atomization. – **registered in: Web of Science, Master Journal List, Scopus.** In: Journal of Alloys and Compounds. - ISSN 0925-8388. - Vol. 615, iss. S1 (2014), S217-S223.

Babalová, Eva - Behúlová, Mária: Numerical simulation of temperature fields by welding of Ti-Al alloys applying volumetric heat source. – **registered in: Web of Science, Scopus.** In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 887-888. - , 2014, pp. 1280-1283.

Babalová, Eva: Temperature measurement and finite element modeling methodology for laser cutting of stainless steel plate. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 321-326.

Bučányová, Marcela: Component base for CNC processing center EMCO Concept TURN 105. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 242-248.

Danišová, Nina: Digital image processing in the camera system of assembly systems ICIM. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 173-178.

Delgado Sobrino, Daynier Rolando - Košťál, Peter - Vavruška, Jan: On the analysis and customization of an Icim 3000 system: a take on the material flow, its complexity and few general issues to improve. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 42-48.

Díaz Cazañas, Ronald - Delgado Sobrino, Daynier Rolando: On the integration of production and maintenance planning at the tactical level: proposal of a contribution procedure. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 35-41.

Ďuriš, Rastislav: Application of camera image processing to control of humanoid robot motion. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 179-185

Hajdu, Štefan: Investigation of stress state and contact pressures in contact area of journal bearing by numerical simulation. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474 (2014), pp. 200-205.

Holubek, Radovan: Possibility of the process monitoring during assembly and disassembly components. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 206-211.

Holubek, Radovan - Ružarovský, Roman: The methods for increasing of the efficiency in the intelligent assembly cell. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 470 : 2nd International Conference on Mechanical Engineering, Materials Science and Civil Engineering (ICMEMSCE 2013), Beijing, China, 25 -26 October 2013. - , 2014. - ISBN 978-303785961-2, pp. 729-732.

Hrušková, Erika: Relative term of capacity computations and manufacturing system design. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 55-60.

Javorová, Angela: CA systems and modularity principles as tools for flexible and efficient production systems design. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 61-66.

Javorová, Angela - Kusá, Martina: Robotic system design with CA system support. - **registered in: Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 613 : 13th International conference on Industrial, Service and Humanoid Robotics, ROBTEP 2014, Štrbské Pleso, Slovakia, 15 - 17 May 2014. - , 2014. - ISBN 978-303835202-0, pp. 208-213.

Košťál, Peter - Delgado Sobrino, Daynier Rolando: Flexible manufacturing system for drawingless manufacturing. - **registered in: Web of Science, Scopus.** In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 581. Precision Machining VII: 7th International Congress of Precision Machining (ICPM 2013), October 3 - 5, 2013, Miskolc, Hungary (2014). - Durnten-Zurich: Trans Tech Publications. - ISBN 978-3-03785-840-0, pp. 527-532.

Kraváriková, Helena: Examination of temperature and stress fields in the welding process. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 297-302.

Kupec, Tomáš - Behúlová, Mária - Turňa, Milan - Sahul, Miroslav: Friction stir welding of magnesium alloy type AZ 31. - **registered in: Scopus.** In: Magnesium Technology 2014: Proceedings of symposium sponsored by the Magnesium Comittee of Light Metals Division of the Minerals, Metals & Materials Society (TMS) held during TMS 2014. February 16 - 20, 2014, San Diego, California, USA. - California: TMS, 2014. - ISBN 978-1-118-88816-2. - pp. 311-315.

Kusá, Martina - Pecháček, František: Design of experiments and definition of criteria for the evaluation and analysis of the process of machining in a robotic system. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 85-90.

Labašová, Eva: The size of the friction coefficient depending on the size and course of normal load. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, p. 303-308.

Matúšová, Miriam: Material flow design supported by simulation methods. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 91-96.

Naď, Milan - Rolník, Ladislav: Modification of modal characteristics of machining tool body by reinforcement with non-uniform cross-section. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 309-314.

Oravcová, Jarmila: The numerical simulation of workpiece clamping. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 218-223.

Riečičiarová, Eva: The influence of technological loading on stable operating state of asynchronous motor. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 230-235.

Ružarovský, Roman: Direct production from CAD models considering on integration with CIM flexible production system. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 103-108.

Šimúnová, Michala - Velíšek, Karol: The sensory devices in the assembly workspace of an intelligent assembly cell. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 109-114.

This part of Annual Report 2014 was verified by Prof. h. c. Prof. Ing. Karol Velíšek, CSc.

INSTITUTE OF INDUSTRIAL ENGINEERING AND MANAGEMENT

CONTACT

Director Prof. Ing. Miloš Čambál, CSc.
e-mail: milos.cambal@stuba.sk
tel.: +421 918 646 050

New management of the Institute since 01/12/2014

Director doc. Ing. Jana Šujanová, CSc.
e-mail: jana.sujanova@stuba.sk
tel.: +421 918 646 062

Address Paulínska 16, 917 24 Trnava, Slovak Republic
tel.: +421 918 646 032

STAFF

- Professors: 5
- Assoc. Professors: 9
- Senior Lecturers: 17
- Research Fellows: 6
- PhD Students: 34

EDUCATION AT THE INSTITUTE

Number of students (at 30/10/2014) registered on study programmes offered by the Institute: **849**
Number of students graduated in the academic year 2013/2014 from the study programmes offered by the Institute: **302**

STUDY PROGRAMMES

- Industrial Management
- Personnel Policy in Industrial Plant

ACTIVITIES OF THE INSTITUTE

Date	Title of event or activity at the Institute in 2014
18/01/ – 21/01/ 2014	Visit of **dr. ing. Anna Saniuk, dr. hab. ing. Sebastian Saniuk** and **dr hab. ing. Krzysztof Witkowski** – University of Zielona Góra.
31/01/ – 31/05/2014	Erasmus mobility in Johnson Controls, Poland – **Ing. Matej Daňo**.
13/03– 17/06/2014	SAIA mobility: **dr. ing. Marcin Relich**.
09/04/ 2014	Student **Bc. Vladimír Krajčo won the** 2nd place in the 10th year of the International Student Research Conference 2014 in the Master's category at the Faculty of Economics and Management, University of Tomáš Baťa in Zlín, Czech Republic.
10 - 11/04/ 2014	**ECIC 2014 - The 6th European Conference on Intellectual Capital (coordinator: UPIM)** http://academic-conferences.org/ecic/ecic2014/ecic14-home.htm Research and programme coordinators of the Conference: **doc. Mgr. Dagmar Cagáňová, PhD., Prof. Ing. Miloš Čambál, PhD. and doc. Ing. Jana Šujanová, CSc.**
10 – 11/04/ 2014	Visit of **Prof. Dr. Marta Christina Suciu**, Academia de Studii Economice din Bucurest – Romania.
21/04 – 27/04/2014	Invited lecture: **dr. inż. Paweł Kuždowicz** – proALPHA, Poland.
23/04/2014	Visit of a foreign guest and negotiations regarding international cooperation with **Amir Raveh** of Create-Net, an expert in start-ups.
24 – 25/04/2014	**Festival of Science and Innovations** within the project of the V4 Festival of Science as a platform for intensifying collaboration among V4 universities, http://festivalofscience.eu/program/konferencia
24/04/2014	Visit of a foreign guest and negotiations on potential international cooperation with **Assaf Mendelson** of Create-Net, an expert in start-ups and CEO of EAI Italy.
25/04/2014	Visit of a foreign guest and negotiations on potential international cooperation with **Rumen Dobrinsky**, an expert in the field of international projects.
06/05/2014	**Bc. Ján Juroš**, an STU MTF student won the 2nd place in the 55th year of the international Student Research Conference at the TU in Zvolen, Faculty of Wood Science and Engineering.
13/05 – 24/06/2014	Visit of a foreign guest and negotiations on potential international cooperation with **Atul B. Borade** and **Samir J. Deshmukh** of Jawaharlal Darda Institute of Engineering and Technology, India.
26 – 28/05/2014	Seminar within an EU project: **Stela Stancheva**.
11/07/2014	Agreement of cooperation signed by **Dr. Imre Túróczi** and **Dr. Marta Kórodi** of Szolnok College, Hungary.
28/07– 15/08/ 2014	**Summer University in cooperation with the Vienna University in Austria within the project "Knowledge exchange in the framework of alternative economic systems for the promotion of sustainable regional development".** (acronym ALTECS)
13/10/2014	**The Best Student Project**, finals of the competition co-organised by UPIM, as a partner of Produktívne.sk.
13/10/2014	UPIM winners of the Best Student Project **1st place** **Ing. Vladimír Krajčo** Topic: Proposal of an effective assembly process in the assembly workplace of VS 20 via MTM UAS in ZF Boge Elastmetall Slovakia in Trnava, a.s., Supervisor: Ing. Juraj Drahňovský, PhD. **2nd place** **Bc. Filip Galgóci** Topic: Proposal of measures for modifying the layout of market warehouse in the production department of the passenger car clutches and dual-mass flywheels in ZF SACHS Slovakia, a. s. Supervisor: doc. Ing. Helena Vidová, PhD. **3rd place** **Ing. Ján Juroš** Topic: Proposal of a more effective process of exchanging dies of vulcanizing presses by the SMED (Single Minute Exchange of Dies) method in ZF Boge Elastmetall Slovakia, a.s., Trnava Supervisor: Ing. Juraj Drahňovský, PhD.
03/11/2014	Excursion of the UPIM staff and students in CHEMOSVIT FOLIE, a. s., Svit – connecting the theoretical knowledge acquired during the studies with practical short-term education in the conditions of industrial practice
08 – 12/09/2014	Seminar on the Programme scheme of H2020 – **Paola Baruchelli**
22 – 26/09/2014	Seminar on Social networks and social innovations – **Luigi Telesca**
24/9– 02/12/2014	Erasmus mobility in Create-Net, Italy – Ing. Erika Pokorná
29/9 – 29/12/2014	Erasmus mobility in the University of Zielona Góra – **Ing. Ľubomír Šmída, MSc. Paul Woolliscroft, Ing. Marta Špirková**
22/10/2014	**doc. Mgr. Dagmar Cagáňová, PhD., doc. Ing. Helena Makyšová, PhD. and doc. Ing. Andrea Chlpeková, PhD.** became members of the STU MTF Academic Senate
27 – 29/10/2014	**Summit Rome IoT 2014: Mobility and Smart Cities 2014 Conference, scientific guarantors of the Conference: doc. Ing. Jana Šujanová, CSc. and doc. Mgr. Dagmar Cagáňová, PhD.** - President of the Scientific Committee of the Mobility for Growth Conference (Rome, 2014) **and programme and organisation provision of the Conference** http://www.mtf.stuba.sk/sk/diani-na-mtf/aktuality/mtf-stu-spoluorganizatorom-international-conference-on-mobility-and-smart-cities-2014-v-rime.html?page_id=11357
24/11/2014	Excursion of the UPIM staff and students to IKEA Industry Slovakia s. r. o. in Trnava, plant in Majcichov – connecting the theoretical knowledge acquired during the studies with practical short-term education in the conditions of industrial practice.
01/12/2014	**doc. Ing. Jana Šujanová, CSc.** was appointed the Director of UPIM; **doc. Mgr. Dagmar Cagáňová, PhD., doc. Ing. Helena Makyšová, PhD., Ing. Zdenka Gyurák Bábeľová, PhD., doc. Ing. Marek Jemala, PhD.** were appointed vice-directors of UPIM.
03/12/2014	Excursion of the UPIM staff and students to Volkswagen Slovakia – connecting the theoretical knowledge acquired during the studies with practical short-term education in the conditions of industrial practice.
04/12/2014	Seminar – Social innovations, intellectual and social capital, doc. Mgr. Dagmar Cagáňová, PhD.
09 – 11/12/2014	Value Tools 2014 International Conference, Bratislava, in cooperation with EAI SK (European Alliance for Innovation, Slovakia) professional and organisational provision.
10 – 11/12/2014	Excursion of UPIM staff and students to INA Kysuce, spol. s r.o. - Kysucké Nové Mesto and CEIT a.s. Žilina, – connecting the theoretical knowledge acquired during the studies with practical short-term education in the conditions of industrial practice.
26/11/2015	Meeting of the STU MTF Management and UPIM representatives with the representatives of BOSCH České Budejovice regarding the cooperation agreement.

INVITED LECTURES:

doc. Mgr. Dagmar Cagáňová, PhD. - doc. Ing. Jana Šujanová, CSc.
"Innovation, knowledge and multicultural management influence on intellectual capital in industrial enterprises" 6th European Conference on Intellectual Capital, Trnava, Slovakia, April 2014

http://academic-conferences.org/ecic/ecic2014/ecic14-home.htm

doc. Mgr. Dagmar Cagáňová, PhD.
"Aspects of Interculturality and Knowledge Management",
"EU projects and issues of multicural project teams".
"The future of universities and education in the EU",
"The role of networking for collaboration and innovation",
"Multiculturality and international entrepreneurship",
"European research area H2020". Santa Clara University, Faculty of Industrial Engineering and Tourism, Department of Industrial Engineerig, Cuba, 13th – 25th October 2014.

doc. Ing. Jana Šujanová, CSc.
What will be the University of the Future? MARVI 2014 Conference, Rajecké Teplice 6th – 7th November 2014, University of Žilina
doc. Mgr. Dagmar Cagáňová, PhD.
Marketing Universities: Networks and Partnerships, MARVI 2014 Conference, Rajecké Teplice 6th – 7th November 2014, University of Žilina

doc. Cagáňová, D. –doc. Špirková, D. – doc. Šujanová, J.
Cluster Policy and Its Influence on Economic Competitiveness, 4th International Scientific Conference, Management of Manufacturing Systems 2014, Starý Smokovec, 1.-3-10-2014

doc. Cagáňová, D. –doc. Špirková, D. – doc. Šujanová, J.
Smart Housing in Sustainable Development, Internet of Things 2014 Summit, Mobility and Smart Cities 2014 Conference, Rome, Italy, 27th - 29th October 2014

doc. Ing. Jana Šujanová, CSc.
The perspectives and direction of working with young talent students at universities - "Young VŠEMvs Science 2014", 12th November 2014, School of Economics and Management in Public Administration in Bratislava.

doc. Mgr. Dagmar Cagáňová, PhD.
The support of young people in science and research via mobility and networking - "Young VŠEMvs Science 2014", 12th November 2014, School of Economics and Management in Public Administration in Bratislava.

GRADUATE PROFILE

BACHELOR'S PROGRAMME (Bc.)

Industrial Management
The study programme is aimed at acquiring knowledge and skills in the field of engineering and management of industrial companies, particularly in the areas of company economics, company management, production management, logistics, process management, economics and financial aspects of enterprises, as well as utilisation of effective tools of industrial engineering in the above-mentioned fields.
The education form is oriented on practical application of the acquired knowledge particularly on the level of the first-line and middle management in industrial companies.
The graduate of the Bachelor's study programme "Industrial Management" understands the social-technology systems that integrate human resources, information, materials, devices and processes in the complex life-cycle of products and services. S/he has mastered the knowledge of natural sciences, technology and human sciences as well as the fundamentals of informatics, environmental science and production quality, along with specific knowledge in the fields of industrial engineering and management focused on company economics, company management, production management, personnel management, accountancy, decision-making, team work etc. in practical applications.
The graduate of the Bachelor's study programme of Industrial Management is able, in terms of sustainable development, to design, develop, implement and improve integrated systems including people, materials, information, equipment, energies and environment on the levels required for first-line and middle management. When dealing with the above-mentioned problems, s/he uses suitable analytical, computational and experimental methods.
The graduate of the Bachelor's study programme of Industrial Management is prepared to perform managerial tasks such as planning, organising, leading and controlling in the fields of human resources, and finances, production, logistics, quality and maintenance.

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 literacy, will enable the effective management of human resources. 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 finance 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, including the field of financial management.

MASTER'S PROGRAMME (Ing.)

Industrial Management
The study programme is aimed at acquiring the knowledge and skills in the field of industrial management and the management of industrial companies in particular. It is oriented on acquiring the knowledge and skills in the field of designing production systems and processes, production management, operational analysis, innovation, project and information management, modelling, simulation and the optimisation of processes and systems within the concept of sustainable corporate social responsibility with a specific focus on industrial companies. The teaching format is oriented on the practical application of the acquired knowledge at the levels of middle and top managements in industrial companies.
The graduate will gain a complete Master's education in the study field of "Industrial Engineering" with the focus on planning, designing, implementing and managing industrial systems, and developing creativity in the field of the engineering works and processes design. S/he is able to integrate and optimise the company activities so that their output brings benefits in the form of high sustainable performance. His/her duties involve planning, designing, managing and implementing the complex production systems and the systems for providing high cost effectiveness, reliability, safety and management in the above-mentioned systems.

POSTGRADUATE PROGRAMME (PhD.)

Industrial Management

The Doctoral study programme in Industrial Management will provide students with education focused on mastering the research tasks in the key fields of management and industrial engineering, while focusing on the design of innovative procedures and products.
The study programme is designed to develop student competences via contributing to the knowledge pool, innovations and design of new knowledge and procedures. Students will gain deep theoretical knowledge and methodology fundamentals which will enable them to conduct independent research based on the principles of sustainable development and ethics.
The study programme is aimed at collecting the knowledge and skills in the fields of industrial engineering and management, with orientation on the scientific and research methods in the given field (industrial engineering, management, economic sciences, research techniques, production design, economic systems and processes, intercultural management etc.).

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
Diploma Thesis
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
General Economic Theory
Gradual Project
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
Market Research and Monitoring of Customer Satisfaction
Marketing
Marketing Management
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
Production Management I, II
Professional Practice
Project and Process Management in Quality Management
Project Management
Project of Conformity Assessment
Quality Audits
Quality Management Case Studies
Research Thesis I, II, III, IV, V, VI, VII
Standardisation, Certification, Conformity Assessment
Statistical Methods
Statistical Methods in Process Improvement
Statistical Methods of Quality Control
Strategic Management
Tax Management
Tools and Techniques of Quality Management

GRADUATE THESES

List of theses contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Master's Theses
Roman Blažo, Proposal of the system of categorization and description of work positions in VACUUMSCHMELZE, s.r.o.
Debnárová, Lucia: Analysis and optimization of teamwork forms in the implementation of projects in Matador Holding, p.l.c.
Ján Škojec , Improvement proposals of material flow in ZLK company.
Molnár, Gabrie: Proposals and evaluation of indicators for measuring of effectivity of education Hella Slovakia Front-Lighting, Ltd.
Schiffel, Lukáš: Draft for the application of sustainable human resource management in Nestlé Slovakia s.r.o. in the context of the creation of sustainable shared values
Krajčo, Vladimír: The proposal of effective assembly process at the assembly workplace VS 20 by means of analysis MTM UAS in the company ZF Boge Elastmetall Slovakia, a.s., Trnava
Kollariková, Monika: Ergonomic streamline the process of manual handling and arrangement of selected departments in company STREIT TRNAVA s.r.o.
Michálíková, Monika: Proposal for the implementation of environmental management system in the company AKAtech Kabelkonfektionierung GmbH, Hlohovec
Lenický, Miloš: The proposal of implementation monitoring system for compressors in the production unit Hydrocrack in the company Slovnaft a.s.
Marcinek, Ján: Proposal for implementation of the requirements of STN EN ISO 50001:2012 for the energy management system in corporation Emerson a.s.
Drobná, Dominika: The proposal for the Implementation of the Process Approach in the Field of personnel management in the company Praktik Textil s.r.o., Trnava
Zaťková, Martina: Proposal for implementation of selected lean tools into the logistics of repairs of wagons in ŽOS Trnava corp.
Krcheňová, Veronika: The proposal for the innovation of the marketing mix products in the company I.M.D.K. BA, s. r. o. in the context of sustainable development and socially sustainable and responsible business
Vychopenová, Dominika: Proposal the innovation of the marketing mix products in the company SLOVLAK Koseca, a.s. in the context of sustainable development and socially sustainable and responsible business
Herega, Roman: Devising a marketing strategy in industrial company HKS Forge, LLC. Trnava
Plaščiaková, Veronika: Measuring and evaluating of the work performance in a company PIVOT+QARI, spol. s r. o.

Bariš, Radoslav: Proposal for a methodology for the monitoring and management of receivables venture in VETROPACK NEMŠOVÁ s.r.o.
Kovács, Peter: Proposal of Model of Financial Planning in the Industrial Company
Chodúrová, Monika: Proposal for improvement of costing system in the company Senapo Ltd.
Turaničová, Barbora: Proposal for improving the material flow of company BOHUŠ s.r.o., Závadka nad Hronom
Buday, Michal: The proposal to improve the process of corporate planning and budgets of selected centers in industrial company
Matonok, Lenka: Proposal for improve creating calculations in company Jaroslav Beneš - ŽERIAVY, Banská Bystrica
Rosa, Pavol: Proposal to Improve the Supply and Stockholding in Plant Continental Matador Truck Tires s. r. o., Púchov
Kabát, Ľubomír: The proposal to streamlining processes of bonding and tinning in company VACUUMSCHMELZE, s. r. o., Horná Streda
Juroš, Ján: Proposed Measures For Advanced of Retyping of Vulcanising Press Using SMED Methodology in ZF Boge Elastmetal Slovakia, a.s., Trnava
Poláček, Ivan: Proposal for streamlining 100% checking for Sensotretlager - shaft in the enterprise INA SKALICA spol. s.r.o.
Jakubek, Ľuboš: The proposal for improvements to the measurement and evaluation of employees' performance in the company Knott
Blahutová, Michaela: Proposal to improve the processes in the company Inalfa Roof Systems Slovakia s.r.o.
Čulák, Miloš: Proposal to improve the project management process from the parent undertaking to the subsidiary companies
Lamanec, Miroslav: Proposal to improve the process of creation and approval of calculations in the enterprise Management and Maintenance of roads in Trnava region
Brošová, Kristína: Proposals for improving human resource management in POSS-SLPC, Ltd.
Kvasnicová, Katarína: Proposal to improve human resource management system in the chosen company.
Školárová, Zuzana: Proposal to improve managers training and their development in selected industrial enterprise
Sabová, Dominika: Suggestion to improve the application of quality management principles in the process of project management
Lošonská, Dominika: Proposal of decrease the cost for rubber-metal part production and scrap in company ZF Boge Elastmetall Slovakia, a.s.
Kuzmová, Lenka: The proposal to reduction costs in the company Faurecia Slovakia s.r.o.
Blaho, Martin: Proposal of manufacturing expenses reduction by implementing technological innovations of manufacturing processes in the filling production division of the I.D.C Holding, a.s., branch Pečivárne Sereď
Holovičová, Katarína: Proposal for increasing of efficiency on manufacturing line within company I.D.C. Holding, PLC, branch Figaro Trnava
Kolesárová, Karin: Proposal to increase the technical usability of the assembly line Renault / Dacia using the Andon system in the company ZF Boge Elastmetall Slovakia, a.s., Trnava
Slobodová, Emília: Proposal current marketing communication tools to improve brand awareness COLOR Company Ltd. in the context of sustainable development and sustainable corporate social responsibility
Macko, Stanislav: Proposal for optimalized transport system of the transported boxes in the company PCA Slovakia, s. r. o., Trnava
Bajkai, Ľudovít: Proposal of organization and maintenance management system of railway wagon
Sedláková, Dominika: Proposal of personal development of employees at CIP department in Magna Slovteca corporation, s.r.o., o.z. Magna Trnava
Kuricová, Radka: A Proposal of financial sources evaluation procedures during acquisition of tangible investment goods in company BC LOGISTICS ltd., Trnava
Hrachová, Simona: The proposal of creation proces and evaluation of investment intentions in the company
Horňáková, Mária: Design for implementation of procedural approach to the area of human resources in Silcotec Europe (SK), s. r. o. Komárno
Hrašková, Katarína: Proposals process of education of employees in the context of USZP in the company Continental Automotive Systems Slovakia s.r.o.
Patková, Petra: Proposal of adaptations program for selected groups of staff in the company Danfoss Power Solutions Inc.
Štefanigová, Monika: Recommendation rationalization of supply and storage in logistics organization
Sivák, Marek: The proposal of the solution for the ergonomic rationalization CPL department in the company PCA Slovakia, s.r.o., Trnava
Lány, Miroslav: The suggestion of ergonomic rationalization in company KOVOSPOL Ltd. Liptovský Hrádok
Demian, Matúš: Proposal to address racionalization in selected business operations in Železiarne Podbrezová a. s.
Žigová, Martina: Suggestion for ergonomic racionalization in chosen operations of JASPLASTIK-SK spol. s r.o. company in Galanta
Hajíčková, Miroslava: The proposal to streamline the operation of glucose line in company AMYLUM SLOVAKIA spol. s r.o.
Straka, Marek: Solution proposal to streamline operation of the production line full bowl pump PKW torque converter, through selected lean methods in the company
Vrábľová, Martina: Proposal for solution on how to make manipulation with tyres more effective in warehouse with finished products in Continental Matador Rubber, s. r. o.
Kázmérová, Veronika: Solution proposal to streamline the process of selecting and evaluating suppliers inventory management and inter area transport company ZVS holding, a.s.
Benedikovičová, Lenka: The proposal of solution to improve the project management of changes in an industrial enterprise
Hudáková, Daniela: Proposal of solution for continue of ergonomic programme in chosen facilities of company Johnson Controls International, spol. s.r.o. – OZ
Zajíčková, Ivana: Proposal solution to improve the measurement and management of employee performance
Feješová, Viktória: Proposal for systemic changes to improve the project management in the company PPS Group, a.s.
Blažo, Roman: Proposal for the classification and description of job positions in company Vacuumschmelze, s.r.o.
Bucha, Pavol: Proposal of motivational system aimed at sustainable performance of employees of company METALPORT Ltd.
Spišáková, Alžbeta: System proposal of the motivation for employees over 45 years, in the terms of the industrial enterprises
Fulek, Roman: Proposal of succession system in condition of ŽOS Trnava, a.s.
Štangová, Miroslava: Proposal for the remuneration of work motivation accepting procedere ŽOS Trnava, a.s.
Zubalíková, Zuzana: System design receiving and release of employees in a company Protherm Production, s. r. o.
Janík, Noémi: Proposal for a system of recruitment and release of employees in the company SAM - SHIPBUILDING AND MACHINERY a.s.
Kubašová, Mária: Design of the career management staff with a focus on succession in selected industrial enterprise
Šmidáková, Janka: Proposal for a system employee development with a focus on sustainable growth and performance of employees in the company PROTHERM PRODUCTION s.r.o.
Kutlišová, Martina: Motion of stabilization system production staff through the processes of human resource management in the business enterprise Hornonitranske bane Prievidza, a. s.
Zigová, Ivana: The design of production staff stabilization system in Matador Industries, Inc. Dubnica nad Váhom
Ištvánová, Martina: The introduction of talent management in terms of selected Industrial Company
Karnasová, Hana: Proposal of the system for recruitment and selection process in company FARMA MAJCICHOV, a.s.
Szalayová, Eva: Implementation of recruitment and selection of employees system in a Vaillant Industrial Slovakia s.r.o.
Rumlerová, Lucia: Proposal for a sustainable system of cooperation with external recruitment agencies in conditions of FINE DNC Slovakia, s.r.o.
Kunovská, Patrícia: Proposal to using product design as a tool of marketing mix in the company Emerson a.s., Nové Mesto nad Váhom
Dedíková, Kristína: Design of using marketing tools in system of handling in production company HPM Therm s r.o., Moravske Lieskove
Pazinová, Jozefína: Application of AHP method and software Expert Choice for waste minizing in the packinging process in manufactorin company PSS SVIDNÍK a.s.
Schiffel, Matúš: The proposal of using AHP method to determine the competency profile manager company PCA Slovakia, s.r.o in the context of SD and SCSR
Šujaková, Monika: The proposal of using AHP method for determine of worker competency profile of UPIM MTF STU Trnava
Mahajová, Mária: The suggestion of utilization of modern methods during an evaluation of efficiency in the company Slovenské elektrárne, a. s.
Babišová, Monika: The Proposal for the use of Corporate Social Responsibility – objective sustainability strategy in company ŽOS Trnava, a.c.
Pilch, Peter: Proposal use of sustainable marketing in creating a positive image as in the context of the strategy for sustainable corporate social responsibility of the company Slovenske elektrarne, a. s.
Antal, Andrej: Proposal of interucultural management improvement in industiral companies in Slovakia

Bajcar, Marcel: The Proposal to Improve the Corporate Culture of the Company TOMRA Sorting, Ltd.
Škojec, Ján: Improvement proposals of material flow in ZLK company.
Blažek, Miloš: Proposal for Improving Warehousing Material Flow in ŽOS Trnava, OJSC
Janíčková, Miroslava: Proposal for improving the corporate culture of Kellys Bicycles Ltd.
Baďurová, Lenka: Proposal for improving the corporate culture of Silgan Metal Packaging and Nove Mesto a. s.
Dužeková, Martina: System design improvement of corporate culture in terms of Matador Industries , a. s.
Šimová, Petra: Proposal for improving inventory and warehouse management in the EKOM Spol. s. r.o. enterprise
Bábyová, Ivana: The proposal for inventory management improvement in the company DUSLO, a.s. Šaľa
Jakubiecová, Silvia: Proposal for improving the system of further education of employees in the company Slovnaft, Bratislava
Pastýr, Andrej: Proposal for improvement of financial-economic analysis of the company SAM-SHIPBUILDING AND MACHINERY a.s., Bratislava
Baloghová, Erika: Proposal for improvement of employee performance evaluations in a company SLOVNAFT MONTÁŽE A OPRAVY a.s.
Borovský, Jozef: Proposal for Improving Remuneration System of Employees in Company HF NaJUS, a.s. DUBNICA NAD VÁHOM
Kubovičová, Barbara: Proposal for Improving System Performance Management in Industrial Plant
Belaiová, Miroslava: Proposal to improve performance management system of employees in BEKAERT Hlohovec inc.
Petráš, Erik: Proposal improving the system of maintenance and repairs in the company Železničná spoločnosť Slovensko, a.s.
Kováč, Vladimír: The proposal to improve the efficiency of supply and warehousing activities in the company Brovedani Slovakia, s. r. o., Galanta
Brizlák, Miroslav: The proposal to streamline the processes reverse logistics in the context of sustainble development in an industrial undertaking BROVEDANI SLOVAKIA, s.r.o
Moncmanová, Natália: Proposal to streamline reverse logistics processes in the context of sustainable development in industrial company Foxconn Slovakia, s.r.o
Eliáš, Peter: Concept of a better effectiveness of the production planning system for products Daimler 251/252 in ZF Boge Elastmetall Slovakia, a. s.
Beáta Živčicová: Návrh zefektívnenia systému pracovnej motivácie zamestnancov v podniku Scheidt & Bachmann Slovensko s. r. o.
Šimlaštík, Marek: The proposal to reengineer the management and processing system of recievables in the company Duslo, a.s. Šaľa
Tarišková, Zuzana: Design for efficient repairs and maintenance system in SES a. s., Tlmače
Hodulíková, Kristína: Proposal to streamlining of supply the production lines with packing material in the company Foxconn Slovakia, spol. s.r.o.
Schramko, Kristián: Suggestions of improvements of the internal directives in areas of accounting
Bordášová, Katarína: Proposal of improvements in the sphere of monitoring and claim management in Tatrachema company
Medňanská, Barbora: Proposal to improve the adaptation process of manufacturing employees in MAGNA SLOVTECA, Ltd.
Pavlovičová, Monika: The proposal an improvement in measuring and evaluating employee performance in the production department of Magna Slovteca Inc., c.a. Magna Trnava enterprise
Jakabovičová, Dagmar: Suggest the improvements of the workers adaptability in in the company ZF Boge Elastmetall Slovakia,a.s.
Stanková, Iveta: Proposal for improvement of quality management system in the enterprise GeWiS Slovakia s.r.o., Prievidza
Kružliaková, Viera: Suggestion for the improvement of quality management system in the company HELLA Innenleuchten-Systeme Bratislava, s.r.o.
Novák, Jozef: Proposal for improving the employees rewarding system in relation to the performance in the company PROTHERM PRODUCTION s.r.o., Skalica
Rozkošová, Beáta: Proposal to improve the system of management and performance evaluation of employees in the company SILCOTEC EUROPE (SK), ltd.
Fatranská, Andrea: Talent improvement system proposal in the conditions of Bekaert Hlohovec, a.s
Farkasová, Denisa: Suggestion on improving the system of employee performance management in the company Hörnlein, k.s.
Dóza, Peter: Proposal for improving talent management system in terms of MATADOR HOLDING, Inc
Královičová, Katarína: A Suggestion for Improvements in the Areas of Tax and Accounting Aspects of the Profit Or Loss Before Taxing in a Chosen Industrial Establishment
Klokner, Marek: Proposal for improving the performance of project managers in industrial companies in Slovakia
Bartek, Peter: Proposal for reducing the setup time on the production line rotors in the company Askoll Slovakia Ltd. using the method SMED
Mikuš, Ondrej: Proposal for increasing the efficiency of material flow in VACUUMSCHMELTZE, Ltd.
Gaňová, Zuzana: Proposal to increase the efficiency of material flow in the company Bonfiglioli Slovakia Ltd. using the VSM method
Lackovič, Michal: Optimization of manual handling of loads by using the selected methods for the assessment of physical load in selected workplaces in the company Bekaert Hlohovec, a.s.
Horníková, Renáta: Optimization of the flow of invoices within the group of PSA companies in Slovakia, the Czech Republic, and Hungary
Veselková, Andrea: Rationalization of physical load and energy expenditure of employees selected workplace with using the software support 3D SSPP in company ZF SACHS Slovakia, a.s.
Horváth, Ľuboš: System proposal of modernization of the production line at the company Víno Matyšák Ltd.
Tóth, Attila: Improvement of the environmental management system in Silcotec Europe (SK), s.r.o.
GRULIŠOVÁ, Lucia: Increase the effectiveness of the environmental management system in the company HELLA Slovakia Signal-Lighting s.r.o.

PhD Theses
Kortiš, Marián: Analysis of the impact of cost externalization multinational corporations to SMEs in the economy and to suggest recommendations for sustainable use of CAP to solve them
Mazelle, Max: Entwicklung und Darstellung eines allgemeinen Modells zur Implementierung von Innovationsmanagement Ansätzen der Öffentlichen Verwaltung in Industrieunternehmen /Developing an innovation management model of public administration and its implementation in industrial enterprises /
Friedrich, Stefan Markus: Proposal introducing instruments for controlling in private education
Trömner, Marc Sven: Proposal for a methodology of determining the reduction in the market value of fixed assets
Lach, Manfred: Proposal for global engineering principles in local conditions its applications under local conditions
Holeček, Jaroslav: Management interculturality as the enterprise performance factor
Ladvenicová, Katarína: Proposal of methodology for the application of competency model in terms of medium-sized industrial enterprises
Videnová, Veronika: Proposal methodology for resolving conflicts within multicultural teams in industrial enterprises
Beluský, Martin: Suggestion of operation schedulding process optimization in higher types of production

RESEARCH AT THE INSTITUTE

Areas of Research
- Progressive approaches in the area of the Organizational Management,
- 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,
- Green Management,
- Future factory – Digital Factory,
- Production Management,
- Operations Research,
- 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; University of Zielona Gora, Poland, Technical University Ostrava, Czech Republic; Tomas Bata University in Zlín, Czech Republic; University of Iowa, USA; The "Gheorghe Asachi" Technical University of Iasi, Romania; University of Gabrovo, Bulgaria; Ufa State Aviation Technological 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-Panon Regional Development Company; Automotive Cluster Croatia, Automotive Cluster of Slovenia, Automotive Cluster Serbia, Automotive Cluster - Vienna Region, European Alliance for Innovation, VW Slovakia, PSA Peugeot Citroën Trnava, KIA Motors Slovakia, Johns Manville Slovakia. The cooperation is focused on study visits, diploma thesis, training and participation in international projects.

The research areas comprises human resources management, operations research, logistics, innovation management, information management, financial management, project management, quality management, production management with the special emphasis on competencies models, IFRS, creative accounting, financial management of the holding company, financial analysis of enterprise and holding, knowledge management, multicultural management, quality, corporate social responsibility, green management, ergonomics and lean management.

Areas of expertise

- Innovation Management
- Intercultural Management
- ergonomics, Ergonomic Programmes
- Human Resources
- Corporate Culture
- Development of Managerial Competencies
- Corporate Social Responsibility and Sustainable Development
- Systems of Quality Management
- Gender Diversity in research and management
- Project Management
- Logistics, Lean Management
- Innovation Management
- Future Factory – Digital Factory
- Information and Knowledge Management
- Financial Management
- Operations Research
- Production Management

PROJECTS OF THE INSTITUTE

INTERNATIONAL PROJECTS

Project Title	**Festival of Science as a Platform for Intensifying Cooperation between V4 Region Universities**
Coordinator	doc. Mgr. Dagmar Cagáňová, PhD.
Start Date	01/03/2013
End Date	31/08/2014
Programme	International Visegrad Fund
Annotation	The main project feature is to establish a basis for active V4 scientific cooperation using best practice exchange and knowledge transfer. It is an opportunity for linking academic and business institutions from V4 countries that will ensure collaboration in research, education and increased international mobility of university teachers and students. It will also contribute to the popularisation of science for professionals and public and ensure continuation of activities to the future.

Project Title	**Knowledge exchange in the framework of alternative economic systems for the promotion of sustainable regional development** Acronym : ALTECS
Coordinator	doc. Mgr. Dagmar Cagáňová, PhD.
Start Date	01/09/2013
End Date	31/12/2014
Programme	European Territorial Co-operation (ETC) Slovak Republic – Austria
Annotation	The project ALTECS is implemented by the Vienna University of Economics and Business, the Slovak University of Technology in Bratislava, the Ministry of Life, the Vienna Chamber of Commerce and Industry, and the Slovak Chamber of Commerce and Industry Trnava in the framework of the funding programme European Territorial Co-operation (ETC) Slovak Republic – Austria. The objective of the ALTECS project is to set the first steps for a sustainable regional development based on knowledge exchange between companies and students and using knowledge to pursue and implement a responsible and resource conserving economic way. In order to advance ecological, economic, and social sustainability, regional know-how founded on the important pillars science and economy and generated among the involved target groups in the context of a summer university is made available. The realisation of the summer university will be designed together with the "OeAD-WohnraumverwaltungsGmbH" as the initiator and implementing body of this educational method. In this regard, those companies shall be supported that wish to follow a socially, ecologically, and economically exemplary pattern or already represent best practice and can thus give valuable advice. Economy students from Austria and the Slovak Republic will be involved from the sector of science. They will enlarge and also share their knowledge in the field of sustainability in order to elaborate new perspectives for sustainable regional development in the framework of peer group projects together with small and medium-sized enterprises (SMEs). Long-term orientation as an essential indicator of sustainability is achieved in the establishment of a regular platform and network events that will simultaneously accelerate knowledge exchange. The shared set-up and the realisation of the educational programme also fosters relations with the neighbouring country (cultural, economic, ecological, and social) as well as solidarity in the border region and promotes a common responsibility for the cross-border economic area.

Project Title	**EAI SK European Alliance for Innovation Slovakia**
Coordinator	doc. Mgr. Dagmar Cagáňová, PhD.
Start Date	01/03/2014
End Date	30/09/2015
Programme	International Collaboration
Annotation	The main goals of the project are as follows: **Goal 1** Improvement of the automatic web tools to support the convergence of EAI online tools and services supporting the organization of events and publications release.

Goal 2
Utilisation of the web tools to promote entrepreneurs, start-ups and small and medium enterprises through the EAI services
Promotion and presentation of the best innovative products/prototypes and start-ups through the EAI tools and communities
Increase of the productivity through the transfer of technology and research results
Goal 3
Motivation of the users through the building of the thematic groups and forums with the emphasis on the selected innovation themes
Project beneficiaries
- Access to the EAI communities activities
- Connection to influential innovation stakeholders
- Participation in EAI international projects and activities including Horizon 2020 projects
- Fostering of the technology transfer and research results
- Access to the EAI know-how in the area of the ICT tools for the community building, event organization, innovation evaluation and promotion
- Access to funding opportunities for start-ups and spinoffs
- Access to the EAI expertise in development and submission of international projects
- Promotion and international visibility of the Slovak University of Technologies

NATIONAL PROJECTS

Project Title	**Identification of key parameters of sustainable performance of industrial companies under the conditions of a multicultural environment**
Coordinator	Prof. Ing. Miloš Čambál, 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 monocultural organisations.

Project Title	**Information Quality Management in Project Management of Industrial Companies in SR**
Coordinator	doc. Ing. Jana Šujanová, CSc.
Start Date	01/01/2012
End Date	31/12/2014
Programme	VEGA
Annotation	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 Slovakia; ESF 11230220391: Modular system of distant education in project management with elearning and information technologies support; VEGA 1/0491/09: 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.

Project Title	**Implementation of the subject "Corporate Social Responsibility Entrepreneurship" into the Master's study programme Industrial Management at MTF STU Trnava**
Coordinator	Prof. Ing. Peter Sakál, CSc.
Start Date	01.01.2012
End Date	31.12.2014
Programme	KEGA
Annotation	The content of the project concerns the implementation of the subject "Corporate Social Responsibility Entrepreneurship" into the study programme Industrial Management in context of the strategy of corporate social sustainable development of the EU. Firstly accepted in Gothenburg in 2001 and consequently revised in 2006 and 2009. The strategies include, Europe 2020 for Employment and Growth, Enterprise 2020, key findings from the council meeting on 19th November, 2010 about education for sustainable development (2010/C 327/05), and also from the Organisation of United Nations (OSN) summit from 20th22nd September, 2010 regarding the millennium development aims and the present accepted norms. The project also considers ISO 26000 relating to corporate social responsible entrepreneurship

Project Title	**Transformation of the ergonomics programme into the company management structure through integration and utilisation of QMS, EMS, HSMS**
Coordinator	Prof. Ing. Jozef Sablik, CSc.
Start Date	01/01/2013
End Date	31/12/2015
Programme	VEGA
Annotation	The project is aimed to confirm the need, definition of the possibilities and proposal of the process using an integrated QMS/EMS/HSMS for transformation of the content of the ergonomic programme into structured activities of management for the company. Application of the project outputs envisages the creation of conditions that improve the work process, which guarantee a long term high level of work performance with minimal risk to safety and health of employees in accordance with the philosophy of sustainable development.

Project Title	**Centre for Competence Development in Industrial Engineering and Management**
Coordinator	doc. Ing. Jana Šujanová, CSc.
Start Date	01/10/2013
End Date	30/09/2015
Programme	The European Social Fund
Annotation	The Centre for competence development in the field of Industrial Engineering and Management, will focus on supporting the development of human potential in research and innovation in industrial engineering and management, in particular through post-graduate studies and training of researchers and experts from industrial practice, which will also contribute to linking the activities of universities, research centres and companies to the networks.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

Country	Employee
Belgium	Cagáňová Dagmar, doc. Mgr., PhD. Šujanová Jana, doc. Ing., CSc.
Czech Republic	Beňo Rastislav, Ing., PhD. Fidlerová Helena, Ing., PhD. Makyšová Helena, doc. Ing., PhD. Sablik Jozef, Prof. Ing., CSc. Čambál Miloš, Prof. Ing., CSc.
Denmark	Gyurák Babeľová Zdenka, Ing., PhD. Samáková Jana, Ing., PhD.
Cuba	Cagáňová Dagmar, doc. Mgr., PhD.
Germany	Cagáňová Dagmar, doc.Mgr. , PhD. Šujanová Jana, doc. Ing., CSc.
Poland	Cagáňová Dagmar, doc. Mgr., PhD. Čambál Miloš, Prof. Ing., CSc. Makyšová Helena, doc. Ing., PhD.

Country	Employee
Austria	Cagáňová, Dagmar, doc. Mgr. PhD. Chlpeková Andrea, doc. Ing., PhD. Gyurák Babeľová Zdenka, Ing., PhD. Koltnerová Kristína, Ing., PhD. Samáková Jana, Ing., PhD. Šrubařová Ružena, Ing., PhD. Vaňová Jaromíra, doc. Ing., PhD. Zvonár Tibor, Ing.
Russia	Sakál Peter, Prof. Ing., CSc.
Italy	Cagáňová Dagmar, doc. Mgr., PhD. Čambál Miloš,Prof. Ing., CSc Gyurák Babeľová Zdenka, Ing., PhD. Samáková Jana, Ing., PhD. Šujanová Jana, doc. Ing., CSc. Zvonár Tibor, Ing.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

European Alliance for Innovation (EAI)
doc. Mgr. Dagmar Cagáňová, PhD.
Prof. Ing. Miloš Čambál, CSc.
doc. Ing. Jana Šujanová, CSc.

E-COST- European Collaboration in Science and Technology (Európska spolupráca v oblasti vedy a techniky) TN 1301 Sci Generation Management Committee Member
doc. Mgr. Dagmar Cagáňová, PhD.

Danube Academic Confederation (DAC)
doc. Mgr. Dagmar Cagáňová, PhD.
doc. Ing. Jana Šujanová, CSc.

WoodEMA, a.i.
doc. Ing. Jana Šujanová, CSc.
Ing. Jana Samáková, PhD.

International Coaching Federation
Prof. Ing. Miloš Čambál, CSc.

ACM (Association for Computing Machinery)
doc. Ing. Jana Šujanová, CSc..
doc. Mgr. Dagmar Cagáňová, PhD.

Czech Pedagogical Society – Citizens Association
doc. Mgr. Dagmar Cagáňová, PhD.

CASAJC-Czech and Slovak Association of Teachers of Foreign Language at Universities
doc. Mgr. Dagmar Cagáňová, PhD.
Asian School of Management and Technology
doc. Ing. Helena Vidová, PhD.

European Society for Engineering Education (SEFI)
doc. Mgr. Dagmar Cagáňová, PhD.
Prof. Ing. Miloš Čambál, CSc.

European Association for Education in Electrical and Information Engineering (EAEEIE)
Prof. Ing. Miloš Čambál, CSc.
doc. Mgr. Dagmar Cagáňová, PhD.

European Platform of Women Scientists (EPWS)
doc. Mgr. Dagmar Cagáňová, PhD.

Czech Society for Operations Research
Ing. Henrieta Hrablik Chovanová, PhD.

International Academic Network „Human Potential Development in Central and Eastern EU States"
Prof. Ing. Miloš Čambál, CSc.
doc. Mgr. Dagmar Cagáňová, PhD.
doc. Ing. Jana Šujanová, CSc.
Ing. Zdenka Gyurák Bábeľová, PhD.

Polish Scientific Society of Marketing
Ing. Dagmar Babčanová, PhD.

International Association of Engineers (IAENG)
Ing.Helena Fidlerová, PhD.

MEMBERSHIP OF EXPERT GROUPS

Expert group for the popularisation of Universities as engines for development of knowledge society – University students into practice
doc. Mgr. Dagmar Cagáňová, PhD.

National management committee for priority area 7 EU strategies for the Danube region: Knowledge society
doc. Mgr. Dagmar Cagáňová, PhD.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Slovak Academy of Management
Prof. Ing. Miloš Čambál, PhD.
Ing. Marta Kučerová, PhD.
Ing. Miroslava MĺkvaPhD.
doc. Ing. Jaromíra Vaňová, PhD.

European Alliance for Innovation Slovakia (EAI SK)
doc. Mgr. Dagmar Cagáňová, PhD.
Prof. Ing. Miloš Čambál, PhD.
doc. Ing. Jana Šujanová, CSc.
Ing. Tibor Zvonár
MSc. Paul Woolliscroft
Ing. Erika Pokorná
Ing. Rastislav Petráš

Project Management Society
Prof. Ing. Miloš Čambál, PhD.
Ing. Henrieta Hrablik Chovanová, PhD.
Ing. Martina Jakábová, PhD.
Ing. Ružena Šrubařová, PhD.

Slovak Ergonomics Society
Ing. Rastislav Beňo, PhD.
doc. Ing. Karol Hatiar, PhD.
doc. Ing. Andrea Chlpeková, PhD.
Prof. Ing. Jozef Sablik, PhD.

Association of Management Training and Development
prof . Ing. Miloš Čambál, PhD.
doc. Ing. Andrea Chlpeková, PhD.

District Council for Professional Education and Preparation TTSK
doc. Ing. František Horňák, PhD.

Committee for Scientific Management ZSVTS
Prof. Ing. Miloš Čambál, PhD.
Ing.Marta Kučerová, PhD.
Ing. Miroslava MĺkvaPhD.
doc. Ing. Jaromíra Vaňová, PhD.

Association of Institutes for Adult Education (AIVD)
Ing.Zdenka Gyurák Bábeľová, PhD.
Ing. Zuzana Lenhardtová, PhD.

Slovak Anthropological Society
doc. Ing. Karol Hatiar, PhD.

Slovak Association of Finance and Treasury
doc. Ing. Jana Šnircová,PhD.

Automotive Industry Association
Ing. Jaroslav Holeček, PhD.

Republic Union of Employers
Ing. Jaroslav Holeček, PhD.

Slovak Chamber of Commerce and Industry
Ing. Jaroslav Holeček, PhD.

Government Council for Education
Ing. Jaroslav Holeček, PhD.

Government Accreditation Committee
Ing. Jaroslav Holeček, PhD.

Slovak Chamber of Auditors (SKAU)
Ing. Martina Horváthová, PhD.

Slovak Chamber of Teachers
Ing. Henrieta Hrablik Chovanová, PhD.
Ing. Dagmar Babčanová, PhD.

Best Practice User Group Slovakia
Ing. Martina Jakábová, PhD.

Project Management Organisation of Slovakia
Ing. Ružena Šrubařová, PhD.

The Slovak Association of Business Process Management
Ing. Miroslava MĺkvaPhD.
Prof. Ing. Peter Sakál, PhD.
Ing.Helena Fidlerová, PhD.
doc. Ing. Jaromíra Vaňová, PhD.

Membership in Evaluation Committees (VEGA, KEGA, APVV, SAIA, EU Structural Funds)
Ing. Zdenka Gyurák Bábeľová, PhD.
doc. Mgr. Dagmar Cagáňová, PhD.
Prof. Ing. Miloš Čambál, PhD.
Ing. Martina Jakábová, PhD.
doc. Ing. Jana Šujanová, CSc.
doc. Ing. Helena Vidová – Makyšová, PhD.

PUBLICATIONS (MOST IMPORTANT PUBLICATIONS IN 2014)

List of publications contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Fidlerová, Helena - Prachař, Jan - Sakál, Peter: Application of material requirements planning as method for enhancement of production logistics in industrial company. – **registered in: Web of Science, Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474 (2014), pp. 49-54.

Fidlerová, Helena - Prachař, Jan - Horváthová, Martina: Inventory optimization and modeling techniques applied within manufacturing company. - **registered in: Scopus**. In: CMCE 2014 : proceedings of the 3rd International conference on Modeling and Computation in Engineering, (CMCE 2014), Wuxi, China 28 - 29 June 2014. - London : Taylor & Francis Group, 2014. - ISBN 978-113802680-3. - pp. 209-214.

Kučerová, Marta - Fidlerová, Helena: Improvement of a riveting process capability with application of tools and methods of the quality management. - **registered in: Web of Science, Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474. - , 2014, pp. 351-356.

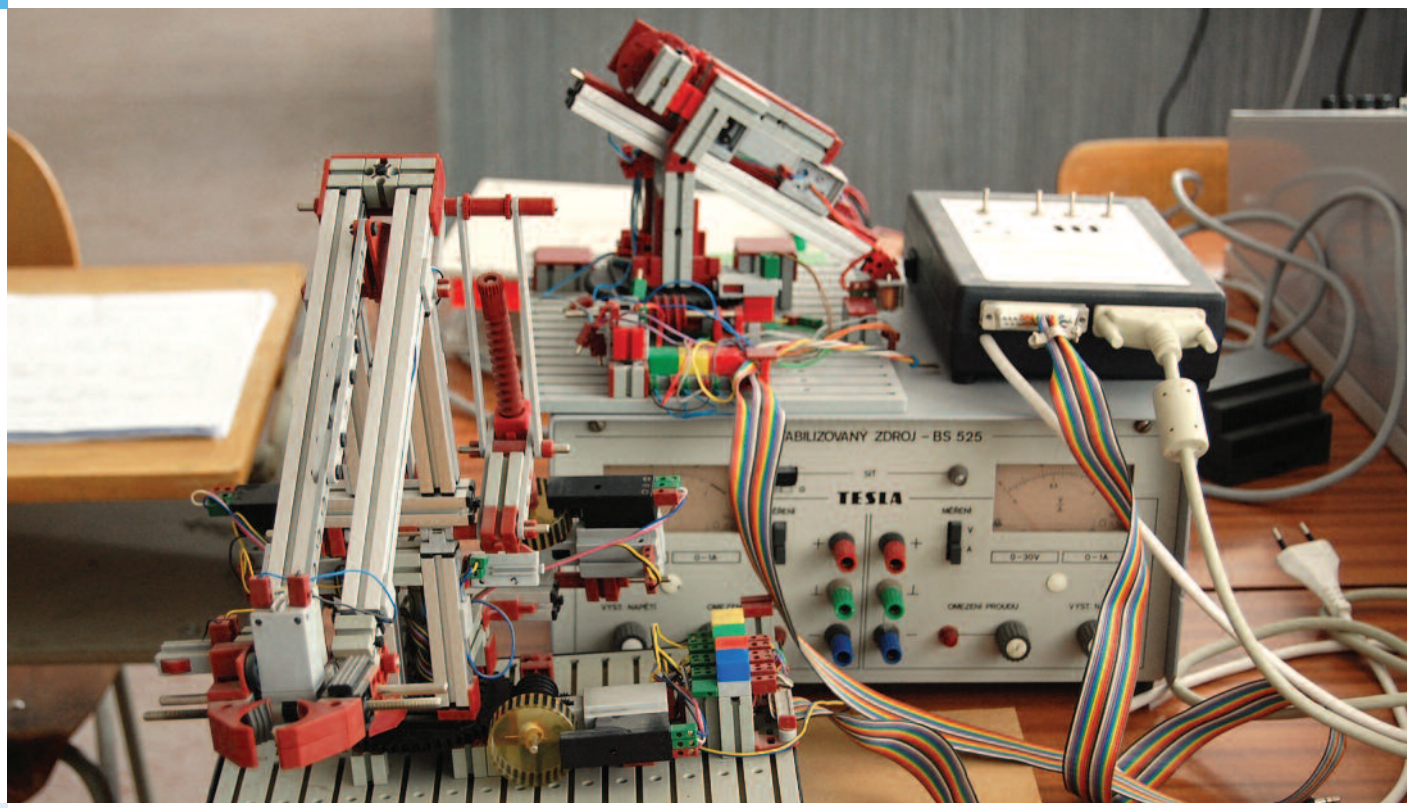
Makraiová, Jana - Pokorná, Erika - Woolliscroft, Paul: Person-organisation fit in the context of cultural learning. - **registered in: Web of Science, Scopus.** In: Procedia Engineering. - ISSN 1877-7058. - Vol. 69 : 24th DAAAM international symposium on Intelligent manufacturing and automation. Zadar, Croatia, 23-26th October 2013. - , 2014, pp. 712-719.

Relich, Marcin - Witkowski, Krzysztof - Saniuk, Sebastian - Šujanová, Jana: Material Demand Forecasting: an ERP System Perspective. - **registered in: Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 527. - , 2014, pp. 311-314.

Szilva, Ivan - Cagáňová, Dagmar - Woolliscroft, Paul: Part sheet usage in the assembly process of small hydro power plants. - **registered in: Scopus**. In: WSEAS Transactions on Environment and Development [elektronický zdroj]. - ISSN 1790-5079. - ISSN 2224-3496. - Vol. 10 (2014), online, p.[197-201].

This part of Annual Report 2014 was verified by Prof. Ing. Miloš Čambál, CSc. and doc. Ing. Jana Šujanová, CSc.

INSTITUTE OF APPLIED INFORMATICS, AUTOMATION AND MATHEMATICS



CONTACT

Director Prof. Ing. Pavol Tanuška, PhD.
e-mail: pavol.tanuska@stuba.sk
tel.: +421918646061

Address Hajdóczyho 1, 917 24 Trnava, Slovak Republic
tel.: +421918646021

STAFF

- Professors: 5
- Assoc. Professors: 8
- Senior Lecturers: 18
- Research Fellows: 4
- PhD Students: 25

EDUCATION AT THE INSTITUTE

Number of students (at 30/10/2014) registered on study programmes offered by the Institute: **468**
Number of students graduated in the academic year 2013/2014 from the study programmes offered by the Institute: **154**

STUDY PROGRAMMES

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

ACTIVITIES OF THE INSTITUTE

Date	Title of event or activity at the Institute in 2014
29/01/2014	STU MTF Open Day
03/02/2014	STU MTF Day of Doctoral Students
20/03/2014	Student Research Conference 2014
13/03/2014	Young Mechatronic 2014 – guaranteed by UIAM
25/04/2014	Festival of Science 2014 – "Closer to science"
30/06/2014	Participation in Campus Week 2014, Festo Didactic in Denkendorf and Esslingen, Germany
04/09/2014	Summer school of young mechatronics

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, acquiring, processing and transformation data, along with experience in programming, computer modelling 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 utilisation 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 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 consequences 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 applied informatics. 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 physical, technological, informatics, automation and control processes in industrial companies and organisations, even at the description level of abstract models. The graduate will master basic technological processes of industrial 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. The graduate will also develop knowledge of data acquiring techniques, data processes and data transmission from the process level to the business level. The graduate will have a deep understanding of the theory of systems, process automation, automation equipment, algorithms, information technology, programming, data processing and data transmission, information systems, real-time systems, visualisation of processes, modelling and simulation of systems, systems for decision support in business activities, systems integration. This knowledge will equip the graduate with the ability to analyse, design and maintain a huge amount of information of technology systems and specific types of information systems for control processes and decision support regarding specific requirements of the enterprise, organisation or institution. The graduate will be aware of the social, moral, legal and economic contexts of the profession in accordance with professional, ethical and legal frameworks applicable to the area of applied information technologies and automation. 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 institutions, information, management and telecommunications systems, software engineering, as well as in schools in educational institutions.

POSTGRADUATE PROGRAMME (PhD.)

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 scientific or research work in the field of research and development of new methods for the management of complex systems based on the latest information about control algorithms. The individual will also be ready to articulate the problem and lead the research team professionally and can also successfully perform as a top development researcher in the top scientific, research and academic institutions in both domestic and foreign labour markets.

LIST OF SUBJECTS OFFERED BY THE INSTITUTE

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

GRADUATE THESES

List of theses contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Master's Theses

Šišitka, M.: Analyse and design of data warehouse for industrial enterprise
Kratochvíl, M.: Application for remote periphery of mobile device communicating through mobile data network
Berčík, P.: Application of welding robot FANUC Arc Mate 120iC/10L in small series production
Franík, J.: Safety standards for safety-critical processes in the railway industry
Kubovičová, J.: Database of facial features used by facial composite systems
Cuninka, P.: Evaluation of safety – critical process according to the selected standard and proposal of the safety automation functions
Hanuliak, M.: Phase portraits of linear and nonlinear dynamical systems
Ujlacký, V.: Identification of position of a mobile device in the building
Mosor, T.: Implementation of application in Customer Relationship Management system
Lepieš, P.: Implementation of the inertial navigation system for sensing the position of a point in space
Kováčová, M.: Information system - electronic agenda for engineering company
Baláž, M.: Information system for the needs of education in the course of the Welding Technology for the Institute of Production Technologies
Galbička, O.: Comparative study of methods for determining production batches
Kraic, D.: Communication system for RACOM radiomodems with compression support
Dubaň, J.: The critical authorizations in SAP
Nagy, M.: Linux driver for RACOM radiomodems
Turanec, T.: Mobile phone application for operating system Android to synchronize with dotProject system
Braniša, T.: Warehousing system model
Benka, T.: The model of connected vessels
Danek, M.: Modeling of traffic system in Hlohovec
Žember, D.: Module of examination for online testing system
Kulich, M.: Visualization module for the on-line exam system
Donoval, K.: Design and implementation of database synchronization and mobile applications of tourism for iOS
Mikulášek, M.: Design and Implementation of the Applications to Control the Development Module Arduino Uno for Adroid
Belan, R.: Design and implementation of information system for production of container systems for industrial use Container
Tadanai, O.: Design and implementation of management information system for land community administration
Kiliany, M.: Design and implementation of High Availability cluster using Oracle Clusterware
Fazekas, M.: Design and implementation of mobile application for home automation control
Zvonár, A.: Design and implementation of system for severe accident management SKR-SAM
Slovák, R.: Design and implementation of robotic workstation using the Safety PLC complying with standard IEC SIL3
Bartoš, M.: Design, analysis and modeling of control system with predictive controller
Mogilský, D.: Construction of electronical torque wrench
Lendel, J.: The design of Fuzzy Control System on the PLC basis
Cigáň, M.: Proposal of the information system for Permanent placement department of Manpower Ltd.
Urban, R.: Information system for the dental company needs
Fuňák, M.: Information system for the company Innov8, Ltd.
Žarnócai, D.: Information system for the company Prestige & Pristine
Miklošovič, T.: Information System Design for Company Realtec plus s.r.o.
Behanec, B.: Design of information system for ŽSR (Railways of Slovak republic) – dynamics ride of the train module
Remenárová, K.: Project Information System training
Kubala, J.: Design of multisensor monitoring system
Hrabala, M.: Proposal for heating plant operation optimization
Šperka, A.: The design of a company network and its internal security
Varga, R.: Suggestion of control system for a model of a vehicle
Ondriga, T.: Proposal for controller for the smokehouse in a meat production company
Hetteš, P.: Design of a robotized workplace for the new production line
Rimovský, T.: Design of software for the formulation of requirements of Smart Home
Braniš, V.: Proposal of system for reporting and evidence incidents and accidents
Šuchaň, J.: Design of virtual model in software Matlab/Simulink
Krošlák, D.: Optimizing the Performance Characteristics of the Vehicle
Matovič, M.: Optimization of product batches of A parts
Lovíšková, K.: The comparison of numerical methods for calculation of double integral
Demian, A.: User interface for evaluation of measured data
Šebeň, T.: Rationalization of a train traffic diagram at selected connecting points using simulation

Grolmus, M.: Realisation of native mobile application for Android platform for support work with CMS Joomla
Šusta, M.: Managing of automated house by PLC
Hnilica, P.: Automation of the unit for completing aluminium closures
Palkovič, J.: Solution to the problem of determining the optimal production batch in discrete manufacturing
Mayyahi, A.H.K.: Simulation of a conveyor system for palettes at peak performance
Tibenský, P.: imulation of logistics process COOP VOZ a.s.
Fraňo, D.: System for distribution of audio and video from analog camera to mobile devices
Potkány, G.: Accommodation information system for needs of ŠDaJ M. Uhra
Rolinec, M.: Determination of optimal production batch for the selected production system
Deák, M.: Virtual controller DC1020
Švec, O.: Creation of framework for executing recurring jobs in MS Dynamics CRM
Brath, M.: Creating the learning portal for selected tasks in discrete mathematics
Kúsek, M.: Usage of the programming interface in VBA in changing of the 3D scene and its photorealistic visualisation
Repka, M.: Use of simulation for improving the production line Belt-drive
Schir, J.: Use of simulation in scheduling operations
Musil, V.: The use of structured cabling for the management of technical equipment
Klačanský, M.: Use of artificial intelligence in computer games
Blahút, M.: Remote access of alarm registration center for technical equipment
Bašovský, G.: Secure internal system for dispatching company
Ralbovský, R.: Introduction of Enterprise Resource Planning system in company
Lengsfeld, M.: Improving the performance of the production line using
Pišteková, G.: Improving the process of windows production
Majko, P.: Improvement of selected parameters of a production system at Hella Slovakia Front-Lighting, s.r.o.

PhD Theses
Horalová Kalinová, Michaela: Structural analysis of complex processes using the data mining methods
Smolárik, Lukáš: Surge control of turbo compressor
Strašifták, Andrej: Processes automation in smart house control
Štrbo, Milan: Complex model-oriented safety analysis of risks in the process for control systems for safety-critical processes development
Ondriga, Ľuboš: Design and implementation of data acquiring and processing methodics for ergonomic system EAWS
Kurnátová, Júlia: Optimization of production targets using simulation optimization
Liška, Vladimír: Frequency control of Duffing's oscillator with high-speed feedback

Habilitation theses
Kopček, Michal: Management of FAT for the process level control systems

RESEARCH AT THE INSTITUTE

The research at the Institute of Applied Informatics, Automation and Mechatronics (UIAM) at STU MTF is focused on the areas of Automation and ICT implementation of the control processes at all levels of control in the enterprise. It reflects modern trends in controlling of the processes according to the pyramid model of control.

The basic strategy of the research management at the UIAM is strictly based on the requirements of the European legislation in harmonising the processes for hierarchical control systems development and operation, as well as on the requirements for vertical integration of information control systems.

The research orientation of the UIAM stems from the efforts to meet the global objectives of human civilisation development:
- By applying the automation to the highest possible level contributing to reducing the energy consumption and its direct impact on the ecology development,
- By consistently elaborating the general requirements formulated in the international standards, carrying out the safety critical control systems development which have an impact on improving the safety and health protection,
- By modelling and testing complex software products, enhancing the efficiency of development, operation and maintaining the hierarchical systems for process control.

On the basis of these principles, the research at the UIAM is focused on the following areas:
1. Research and development in accordance with the requirements of the Factory of the Future:
   - Development of intelligent methods of control and implementation of artificial intelligence to the control,
   - Application of virtual reality and computer simulation technology,
   - Simulation and optimisation of processes and systems,
   - Big Data and knowledge discovery from production databases in the hierarchical process control,
   - Development of methodologies and documentation procedures in the life cycle of the product and development of technologies respecting the so-called good practice principles,
   - Horizontal and vertical integration of information and control systems,
   - Development of methodologies for testing the control systems software,
   - Identification and optimisation of parameters of control with an impact on improving the safety in industrial process control.
   - Development in the field of safety-critical control systems.
2. The basic research:
   - Development of control algorithms based on the dynamical systems theory,
   - Dynamical systems with high-speed feedback control,
   - Utilising the graph theory in the complex network structures.

The scientific profile of the UIAM is consistent with the trends defined by the Industry 4.0 concept. The Institute of Applied Informatics, Automation and Mechatronics together with partners builds the Scientific centre of Automation and ICT Implementation in Production Processes (AIVPS) as a flexible system of automated control of technology and production systems within the University science park project (2013-2015). The aim of the newly prepared scientific centre is to build and establish a strong regional centre of excellence, primarily focused on automotive and electronics industries widely represented in this region (VW, Peugeot-Citroen, ZF, Samsung, Foxconn etc.). The AIVPS centre is about to significantly support the transfer of innovations into the industrial entities.

Areas of expertise:
- Automation and Control of Processes
- Modelling and Simulation of Systems
- Information Systems
- Acceptance Testing of Control Systems Software
- Knowledge Discovery in Databases

PROJECTS OF THE INSTITUTE

Name of the project **Project IPID**
Duration of project 01/2011 - 12/2014
Programme DAAAD - The German Academic Exchange Service
Annotation Within the IPID programme, doctoral students of both universities (TU Ilmenau, Germany and STU MTF) have the chance to participate in mobility at the partner university. The programme aim is to enable both domestic and foreign doctoral students to acquire a multi-national dissertation, thus educating high-quality young researchers for both Slovakia and Germany, and establishing scientific co-operation between the two countries.

The programme involves two activities:

1. Fulfilling the partial objective of the "Autonomy microsystems for biosensorics" project.
   The project aim is to examine and design modern technologies for microtechnologically constructed biosensors which are independent in terms of power and able to communicate with each other in local networks, transferrable and implantable into a human organism. The intention is strongly interdisciplinary, and therefore structured to various branches and faculties.
2. Multi-national network of PhD students.
   The programme simultaneously supports the establishment of a multi-national network for PhD students' education which would enable the exchange and mobility of PhD students and support the perspective of multi-national study programmes and double doctoral degrees.

Name of the project **Workplace: Automation and ICT Implementation of Production Processes and Systems – University Scientific Park**
ITMS of project 26220220179
Duration of project 03/2013 - 06/2015
Operational programme Research and development
Annotation The aim of the project is to build a modern and unique university integrated scientific park and to prepare highly-qualified operative staff for it, to train management for the needs of the regional and the whole country as well as central-European large industrial enterprises in the transfer of the application science results directly into practice.

After the project implementation, CAMPUS STU MTF University Scientific Park will possess a research workplace of Automation and ICT Implementation of Production Processes and Systems with several specialised research laboratories forming the core of the related part of the University Scientific Park, oriented on the development of the control and information technologies. The specified part of the University Scientific Park, i.e. Automation and ICT Implementation of Production Processes and Systems, is in compliance with the intention of the governmental research and technology policy and the Strategy for Europe 2020.

The Park and its laboratories will form a fundamental pillar of the research and development infrastructure in accordance with the University system priority to support the transfer of research and development results into practice, currently preferably in the region and the following geographical expansion.

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
End Date 01/01/2015
Programme KEGA
Annotation The aim of this project was to develop a suitable software environment dedicated to the evaluation of basic metrological and topographical parameters of the scanned 3D surfaces. Application of the software is focused on the Master of Science degree in the following branches of study: Material science and Engineering technologies. The created software package is an alternative to the currently used software for processing the data obtained by the contactless surface scanning. It allows users to process the data remotely without direct access to the microscope or bundled software. The developed software package also extends the ability of processing and evaluation of the surface topography. This package extends the possibilities of processing and surface topography evaluation. Due to the open software concept, it allows the development of additional user requested modules.

Project Title **Study of flexible mechatronics system variable parameters influence on its control**
Coordinator Dr.h.c. Prof. Dr. Ing. Oliver Moravčík
Start date 01.01.2013
End Date 31.12.2015
Programme VEGA
Annotation Within the context of using new flexible materials and derated mechanism constructions in the mechatronics systems, presently a large focus is dedicated to the elimination of spurious frequencies in drives and motional mechanisms in research. Because of the extensity of this issue this project deals with the elected type of mechatronics system only. The basic aim of adaptive control in this type of system is to eliminate ineligible influences. The proposed project is focused on:
Physical and mathematical analysis of parameters influencing control;
Design and verification of chosen advanced control methods;
Investigation of sensitivity and robustness of the solution.
The basic objective of the project is to design in an appropriate manner the flexible mechatronics system adaptive control.

Project title	**Reseach into monitoring and assessing non-standard states in the vicinity of a nuclear power plant**
Coordinator	Prof. Ing. Pavol Tanuška, PhD.
Type	OP VaV
Start date	01/04/2012
End date	30/06/2015
Annotation	Industrial research is focused on the options to improve the quality and effectiveness of monitoring and assessing non-standard states in the vicinity of a nuclear power plant. Its objective is to implement theoretical knowledge of a research organisation and the know-how and experience of a private company into practice by utilising the technology for collection, processing, measurement, distribution, assessment and presentation of the data from the mobile and stationary units and related risks in the vicinity of a nuclear power plant, in order to improve its operation and increase its quality. Advanced sophisticated information and communication technologies along with the elements of the existing telemetric system will be used within the project implementation. The project output will provide a system of utilising the project results in practice, resulting in significant improvement of the existing technologies and procedures. The improvement will assure a higher quality of the collection, scope of data processing, measurement, distribution, assessment and presentation of data and related risks in the vicinity of the nuclear power plant in real time.

Project title	**Writing an interactive multimedia textbook of "Mechatronics" for secondary technical schools**
Coordinator	Ing. Igor Halenár, PhD.
Type	KEGA
Start date	01/01/2012
End date	31/12/2014
Annotation	Various forms of multimedia can be used to support better, more effective and intensive perception of information (texts, pictures, photographs, speech, music, animations, video etc.) in technical subjects. In pedagogy practice, students are not able to absorb all the information delivered to them. It is therefore important to focus the flow of information, select the most important ideas and search for the key message within the subject studied. Multimedia and hypertext provide a tool to support study information, easy information retrieval and orientation within it. The project was focused on the preparation and development of a modern interactive multimedia teaching application for secondary schools in the Slovak Republic with the aim to increase the level of teaching/learning the subject of "Mechatronics)" via video-sequences, programmable interactive animations, pictures and others.

Project title	**Implementation of the internal quality assurance system**
Coordinator	doc. RNDr. Mária Mišútová, PhD.
Type	SOP Human resources
Start date	01/01/2012
End date	30/06/2014
Annotation	The aim of the project was to design and verify a system of objective quality assessment, effectiveness and suitability of education in compliance with sustainable adaptability of universities to the current and future needs of the knowledge society. The project will enable implementation of the system of direct quality measurement of university education, thus providing the space for improving the university output and approximation of the educational system to societal needs. The project objectives were to: design and verify a system of direct quality measurement of university education in the Bachelor degree study programmes in STU MTF; to design and verify the measures for eliminating information deficiencies in the Bachelor degree study programmes in STU MTF, to design and verify the measures for improving the quality of university education in the Bachelor degree study programmes in STU MTF; to design and verify the impact of the above-mentioned measures in the Bachelor degree study programmes at STU MTF.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

Country	Employee
Australia	Kebísek Michal, Ing., PhD. Kopček Michal, Ing., PhD. Tanuška Pavol, prof. Ing.,PhD. Važan Pavel, doc. Ing., PhD.
Belgium	Tanuška Pavol, prof. Ing., PhD.
Czech Republic	Abas Marcel, RNDr., PhD. Božek Pavol, doc. Ing. , CSc. Juhás Martin, Ing., PhD. Juhásová Bohuslava, Ing., PhD.
Canada	Juhás Martin, Ing., PhD. Juhásová Bohuslava, Ing., PhD.

Country	Employee
Hungary	Kopček Michal, Ing., PhD. Škulavík Tomáš, Ing., PhD.
Germany	Kopček Michal, Ing., PhD. Strémy Maximilián, doc. Ing., PhD. Škulavík Tomáš, Ing., PhD. Tanuška Pavol, prof. Ing.,PhD.
Portugal	Bezák Tomáš, Ing., PhD. Eliáš Michal, Ing., PhD.
Russia	Michaľčonok German, doc. Ing., CSc. Škulavík Tomáš, Ing., PhD.
Italy	Špendla Lukáš, Ing., PhD.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

SSKI – Slovak Society for Cybernetics and Informatics of Slovak Academy of Sciences (member of IFAC)
doc. Ing. Peter Schreiber, CSc.
Prof. Ing. Pavol Tanuška, PhD.
doc. Ing. Pavel Važan, PhD.
Prof. h. c. prof. Dr. Ing. Oliver Moravčík
Ing.PhD. Michal Eliáš
Doc. Ing. PhD. Michal Kopček
Ing. PhD. Martin Juhás
Ing. PhD. František Miksa
Ing. PhD. Eduard Nemlaha
doc. Ing. Maximilián Strémy, PhD.
Ing.Tomáš Bezák, PhD.
Ing.Michal Kebísek, PhD.
Ing. Miriam Iringová, PhD.
doc. Ing. German Michaľčonok, PhD.
prof. Ing. Dušan Mudrončík, PhD.
doc. Ing. Jozef Vaský, PhD.
Ing. Andrej Eliáš, PhD.
Ing.Gabriela Križanová, PhD.
Ing. Bohuslava Juhásová, PhD.
doc. Mgr. Róbert Vrábeľ, PhD.
doc. Ing. Pavol Božek, PhD.
Ing.Igor Halenár, PhD.
Ing. Pavol Bezák, PhD.

Association of Slovak Scientific and Technological Societies
doc. RNDr. Mária Mišútová, PhD.

Mensa Slovakia
Mgr.Marcel Abas, PhD.

Slovak Association for Geometry and Graphics
doc. RNDr. Mária Mišútová, PhD.

SASI – Slovak Association of Machining Engineers
Prof. Ing. Pavol Tanuška, PhD.
doc. Ing. Pavel Važan, PhD.

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

IIA - International Informatization Academy, USA
Prof. h.c. prof. Dr. Ing.Oliver Moravčík

International Society for Geometry and Graphics, USA
doc. RNDr. Mária Mišútová, PhD.

IUMB - International Union of Machine Builders, Ukraine
doc. Ing. German Michalčonok, PhD.
doc. Ing. Peter Schreiber, CSc.
Prof. Ing. Pavol Tanuška, PhD.
doc. Ing. Pavel Važan, PhD.

IEEE - Institute of Electrical and Electronics Engineers, USA
Prof. Ing. Pavol Tanuška, PhD.

IACSIT – International Association of Computer Science and Information Technology, Singapore
Prof. h.c. prof. Dr. Ing.Oliver Moravčík
doc. Ing. Peter Schreiber, CSc.
Prof. Ing. Pavol Tanuška, PhD.
doc. Ing. Pavel Važan, PhD.
doc. Mgr. Róbert Vrábeľ, PhD.
Ing.Igor Halenár, PhD.
Doc. Ing. Michal Kopček, PhD.

European Platform of Women Scientists
Prof. h.c. prof. Dr. Ing.Oliver Moravčík

IAEng - International Association of Engineers, Hong Kong
Prof. Ing. Pavol Tanuška, PhD.

PUBLICATIONS (THE MOST IMPORTANT PUBLICATIONS IN 2014)

List of publications contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Abas, Marcel: Cayley graphs of diameter two and any degree with order half of the Moore bound. - Vega 1/0007/14, 1/0811/14. – **registered in: Web of Science, Master Journal List, Scopus**. In: Discrete Applied Mathematics. - ISSN 0166-218X. - Vol. 173 (2014), pp. 1-7.

Schreiber, Peter - Tanuška, Pavol - Vrábeľ, Róbert - Važan, Pavel: A Heat Transfer Approach to the Calculation of Residual Power of Used Nuclear Fuel. - **registered in: Web of Science, Master Journal List, Scopus**. In: Nuclear Technology. - ISSN 0029-5450. - Vol. 185, No 2 (2014), pp. 208-215.

ABRAMOV, Ivan V. - NIKITIN, Yury R. - ABRAMOV, Andrei I. - SOSNOVICH, Ella V. - BOZEK, Pavol. Control and diagnostic model of brushless DC motor. In Journal of Electrical Engineering, 2014, vol. 65, no. 5, online, pp. 277-282. **registered in: Web of Science, Master Journal List, Scopus**.

Jurovatá, Dominika - Važan, Pavel - Kebísek, Michal - Tanuška, Pavol - Hrčka, Lukáš: Prediction of selected production goals by classification methods. - **registered in: Web of Science, Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474 (2014), pp. 115-120.

KOPČEK, Michal - ŠKULAVÍK, Tomáš - TANUŠKA, Pavol - MUDRONČÍK, Dušan. Systematic approach to factory acceptance test planning. Amsterdam: Elsevier, 2014In ESCAPE-24: 24th European symposium on computer aided process engineering. Part A. Hungary, Budapest, 15-18 June 2014, s.CD-ROM, pp. 1597-1602 ISBN 978-0-444-63456-6. - **registered in: Web of Science, Scopus**.

Kurnátová, Júlia - Važan, Pavel - Križanová, Gabriela - Orihelová, Katarína: Assignment of labour to a production line depending on lot size. - **registered in: Web of Science, Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474 (2014), p. 121-126.

Božek, Pavol - Pokorný, Peter: Automatic system for object recognition in robotic production line for automotive industry. - **registered in: Scopus**. In: Mechatronics 2013: 10th International conference. 7 - 9 October 2013, Brno, Czech Republic. - Cham: Springer International Publishing, 2014. - ISBN 978-3-319-02293-2. - pp. 653-662.

Štrbo, Milan - Tanuška, Pavol - Gese, Augustín - Korytár, Marek: Model-oriented safety analysis of dynamic technological systems. - **registered in: Web of Science, Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 474 (2014), pp. 127-134.

PIVARČIOVÁ, Elena - BOŽEK, Pavol. Industrial production surety factor increasing by a system of fingerprint verification. Beijing: IEEE, 2014In ISEEE 2014: proceedings. International conference on Information Science, Electronics and Electrical Engineering. April 26-28, 2014, Sapporo City, Hokkaido, Japan, p.[5] ISBN 978-1-4799-3197-2. - **registered in: Scopus**.

Péči, Matúš - Važan, Pavel: The biggest critical failure factors in ERP implementation. - **registered in: Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 519-520: The 2013 International Forum on Computer and Information Technology (IFCIT 2013), 24 - 25. December 2013, Shenzhen, China. - , 2014, pp. 1476-1480.

NEŠTICKÝ, Martin - PALUMBÍNY, Oleg. On stability Criteria of Third-Order Autonomous Nonlinear Differential Equations with Quasi-Derivatives. b.m.: Springer International Publishing, 2014In Advances in Intelligent Systems and Computing: Proceedings of the International Conference on Systems Science 2013 (ICSS 2013), pp.435-442. ISBN 978-3-319-01856-0. - **registered in: Scopus**.

BOŽEK, Pavol - TURYGIN, Yuri. Measurement of the operating parameters and numerical analysis of the mechanical subsystem. In Measurement Science Review, 2014, Vol. 14, No. 4, online, pp. 198-203 **registered in: Web of Science, Scopus**.

JUHÁSOVÁ, Bohuslava - HALENÁR, Igor - JUHÁS, Martin. The reliability of wireless sensor network. ICCSET 2014: international conference on Computer Science, Engineering and technology, Toronto, Canada, June 16-17, 2014, pp. 834-836

Patents and Standards

Božek, Pavol [author] - Pokorný, Peter [author] - Pivarčiová, Elena [author] - Nikitin, Ju. R. [author] - Halenár, Igor [author] - Šimák, Vojtech [author] - Pirnik, Rastislav [author] - Horváth, Dušan: System of autonomous control of a robot trajectory. - Banská Bystrica: SR Office of Industrial Property, 2014. – Date of application: 14/04/2014.

Božek, Pavol [author] - Pivarčiová, Elena [author] - Trebuňa, Peter [author] - Halenár , Igor [author] - Tóthová, Mária [author] - Harťanský, René [author] - Pirnik, Rastislav [author] - Šimák, Vojtech [author]: System of increasing the safety of tunnels capacity. - Banská Bystrica: SR Office of Industrial Propert, 2014. - Date of application: 14/04/2014.

This part of Annual Report 2014 was verified by prof. Ing. Pavol Tanuška, PhD..

INSTITUTE OF SAFETY, ENVIRONMENT AND QUALITY

CONTACT

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

Address Botanická 49, 917 24 Trnava,
Slovak Republic
tel.: +421918646023

STAFF

- Professors: 2
- Assoc. Professors: 2
- Senior Lecturers: 14
- Research Fellows: 4
- PhD Students: 24

EDUCATION AT THE INSTITUTE

Number of the students (at 30/10/ 2014) registered on the study programmes offered by the institute: **652**
Number of students graduated in the academic year 2013/2014 from the study programmes offered by the Institute: **220**

STUDY PROGRAMMES

Bachelor's Degree
- Occupational Health and Safety
- Production Quality

Master's Degree
- Integrated Safety
- Engineering of Production Quality

Postgraduate Degree
- Integrated Safety
- Engineering of Production Quality

ACTIVITIES OF THE INSTITUTE

Date	Title of event or activity at the Institute in 2014
7th – 12th September	Selected issues of safety engineering and exploitation of nuclear power plants in the context of EU energy policy in Trnava - Faculty of Mechanical and power engineering - Wrocław University of Technology, Faculty of Mechanical Engineering - Technical University of Ostrava, Faculty of Materials Science and Technology in Trnava - Slovak Univeristy of Technology
23. October	Power sources of regions – present and future, Trnava Self-governing region – STU MTF Trnava
30th – 31st October	Advances in Fire and Safety Engineering 2014 – Integrated Safety 2013 – international conference, Trnava

GRADUATE PROFILE

BACHELOR'S PROGRAMME (Bc.)

Work Safety and Health Protection
Graduates from the programme will have gained a thorough theoretical knowledge of natural, economic and social sciences and will have developed knowledge of technical sciences with a focus on safety and reliability of production technologies, safety of work environment and environmental protection. The graduate will also have learnt how to assess the safety of technical systems, production technologies, analysis of failures and disasters, risk identification and quantification, suggestion of preventive measures aimed at the staff and safety improvement and health protection. Those completing the programme will also have gained knowledge in the field of legislative tools for managing dangerous activities, testifying and certification of materials and products and application of safety and technological procedures and parameters of materials. After completing the programme, graduates could find employment as a safety officer in industry, organisations, governmental bodies, insurance companies, or an advisor/consultant in the engineering organisations dealing with designing and assessing safety systems and also utilising knowledge gaining during the programme in order to contribute to the design of a safe and healthy working environment.

Production Quality
The graduate understands the issues of quality management in industrial plants and quality management systems, application of basic tools and techniques of quality management, including statistical methods. The graduate will have gained detailed knowledge of quality management, basic knowledge of natural science disciplines (mathematics, physics), machine technologies and management of machine production. General knowledge of industrial plant management, together with basic computer literacy, will create a supposition of successful communication with research staff as well as management and organisation structures staff in economic organisations. The graduate will achieve ISO standards skills mainly in quality management and will be able to collaborate in operating quality management systems and process related documentation and other regulation documents. The graduate will find employment opportunities as a manager responsible for quality assurance in individual structures of an industrial plant, or an expert in quality management.

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 inspectorates, 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.

Engineering of Production Quality
The graduate understands basic technological and managerial issues of an industrial plant and servicing company, as well as designing, maintaining and implementing quality management systems. The graduate will master the subject matter of international standards for quality management and intellectual property. The graduate will have a deep knowledge of natural sciences and specific areas of plant management, particularly in designing maintaining, implementing and improving quality management systems, total quality management /TQM/ approaches, as well as modern tools and methods of quality management. The graduate is able to develop and implement quality management systems. The graduate may be employed in several areas: industrial companies, services, state administration and at all positions where synergy of management, technical knowledge and skills is needed.

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.

Engineering of Production Quality
The graduate will achieve a complex PhD education in production quality focusing on quality management skills. They will understand the scientific methods of research and development to acquire knowledge. The graduate will be able to develop creative methods in quality management, integrated and complex quality management, to design and operate social-technical and management systems in different types of organisations, to establish innovative processes and to improve the quality management. The graduate is able to analyse the market, to analyse customers, to design and evaluate projects for an organisation. The graduate will be mainly employed as a top manager in different organisations, as a consultant for consulting companies and at universities in scientific research works and education work.

LIST OF SUBJECTS OFFERED BY THE INSTITUTE

Bachelor's Project
Bachelor's Thesis
Basics of Environmental Studies
Basics of Safety Engineering
Connoisseurship of Commodity
Dissertation Project I - VI
Emergency Preparedness for Accidents and Hazardous Situations
Environmental and Safety Information Science
Environmental and Safety Management
Environmental Chemistry
Environmental Engineering
Evaluation of Indoor Environment Aspects of OSH
Fire and Accident Investigation
Fire and Accident Modelling
Fire Dynamics
Fire Engineering
Fire Protection of Buildings
General Chemistry
Hazardous Materials
Human Reliability in Technical Systems
Industrial Toxicology
Inorganic and Organic Chemistry
Introduction to Fire Engineering
Law and Technical Directions of WSHP
Management of Dangerous Activities
Management Systems of the OSH
Measurement and Monitoring of Harmful Substances on Workplace
Occupation Environment Engineering
Pedagogical Activity I - VI
Personal Protective and Rescue Systems
Processes of Environmental Technologies
Professional Practice
Progressive Methods of Integrated Protection of the Environment
Research Work
Reserved Technical Devices
Risk Analysis Methods
Risk Control Methods
Risk Evaluation in the Environment
Risk Theory and Casual Processes
Safety and Reliability of Systems
Safety Engineering
Safety Management
Sanitation of Work
Technological and Natural Emergencies
Technologies of Waste Management
Theory of Fires and Explosions
Diploma Thesis
Thesis Project / Diploma Project
Work Safety and Health Protection
Basics of Quality Management
Statistical Methods of Quality Control
Tools and Techniques of Quality Management
Total Quality Management
Monitoring of Customer Satisfaction
Standardisation, Certification, Conformity Assessment
Case Studies in Quality Management
Quality Audits
Consumer Protection and Complaints Management
Computer Support in Quality Management
Quality Management Systems

GRADUATE THESES

List of theses contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Master's Theses

Nesteš, M.: The analysis of the impact of radioactive waste burning on the environment
Boroš, T.: Analysis of safety measures in distribution of natural gas
Radošinský, P.: Analysis of emergency events threatening the infrastructure of the selected region
Kozáková, M.: The Analysis of occupational hazards in the foundry
Michelčíková, V.: The risk analysis of service for heat and chemical heat treatment of metals
Nosko, G.: Occupational risk analysis in a selected company
Ružbacká, I.: Risk analysis within maintenance and repairs of rail vehicles
Pfeiffer, R.: Risk Analysis in the Wood Industry
Blašková, Z.: Analysis of the method of radioactive waste management in AE Mochovce
Pavlačka, P.: Analysis of appropriate extiguishing agents used for the protection of data centers and server rooms
Blesáková, V.: Application of the Lean Six Sigma methodology to improve bodywork parts of the cars
Babišíková, L.: Application of Six Sigma methodology in proces of manufacturin rubber-metal parts
Václav, Ľ.: The application of methodics Six Sigma in a process of a production of light sources
Petrovičová, I.: Application of DOE method to determine optimal levels of input factors
Bobáková, J.: Aplication of DoE in the manufacturing process of brake calipers
Prítrská, V.: An application of the method Global 8D to solve the problem with the seats in the car
Steinhübel, S.: Application of the method in terms of MORT editor LibreOffice Calc spreadsheet
Kalužová, M.: Audit of health and safety at work in the chosen company
Blanárik, R.: Safe handling with the radioactive waste water in JAVYS, a.s.
Kolarik, I.: Safe operation and maintenance of fire safety systems traction rolling stock
Jančeková, M.: Operators safety at work on vacuum press equipment at the furniture factory Decodom, s.r.o., Topoľčany
Lehutová, S.: Safety in handling and storage of chemicals and mixtures of EKOLAS Ltd.
Čendek, P.: Safety and Environmental aspects of brownfields in the selected Intravilan
Hrebíček, M.: Safety and environmental labeling of selected commodity
Cingel, Z.: Safety labeling of wiring materials
Kovárová, Z.: Safety requirements for the roller skates
Kaiser, P.: Safety requirements for welding workplaces in the company Pivot & Qari
Rigová, G.: Safety rules and signs in tourist resort
Dermíšek, M.: Safety impacts of using control devices and detection systems
Cuninka, P.: Biodegradable plastic shopping bags – The degradation
Pavlačka, P.: Fire detection in electrical cable ducts and cable traces
Žažo, R.: Voluntary reporting in relation to the environment, sustainable development, health and safety
Prekopová, N.: Environmental and Safety Labeling of Products in the Context of Green Public Procurement in Practice
Pénzeš, M.: Experimental determination and comparison of thermal resistance establised layer of selected organic dust
Branišová, M.: Implementation of Tools and Methods Quality Management in the Course of Solving of the Increased Number of Errors of a Type „ASPECT" on the Assembly line
Vyskočová, L.: Implementation of quality tools and methods of quality management with a focus on improving the production process
Krajčír, M.: Integration of process audits according to VDA 6.3 in the system evaluation and selection of suppliers at ArcelorMittal Tailored Blanks Senica, Ltd.
Mikulová, M.: Comprehensive evaluation of Occupational Health and Safety at selected organization
Mareništiaková, V.: A complex evaluation of the level of safety in the company A-STUDIO Ltd.
Halenárová, S.: A comprehensive audit of OSH in selected construction projects
Moravcová, M.: Quality control of materials in the production process, using differential scanning calorimetry
Fraňová, A.: Methods for characterization of biomass feedstock for biofuel production

Smolka, J.: Modeling releases of hazardous substances to health
Bezáková, K.: Monitoring of surface water quality in the micro river basin of Horna Nitra
Szarka, R.: Quality monitoring of surface water in the lower Vah river microbasin
Perlák, M.: Monitoring of groundwater quality in selected areas
Ronda, R.: Potential threats to bank employees and risks elimination
Lipovský, M.: Possibilities of using chemically modified clinoptilolite for sorption of industrial contaminants
Lelák, M.: Possibilities of using of thermogravimetry for soil analysis
Bučková, A.: Waste management in conditions of Prison in Leopoldov
Pethő, D.: Proposal and consecutive application of a working method of a calibration of a measuring device
Medová, E.: Proposal and application of working procedure of calibration of measuring equipment in terms of ZF SACHS Slovakia, PLC Trnava
Baďura, R.: The proposal for a cancellation of a working place and providing of a quality after its removal
Běhalová, N.: Draft measures to improve quality control in the manufacturing sector
Fridrichová, A.: Proposal for reduction of radiant exposure of personnel caused by combustion of ionites at BSC RAO
Zavadanová, M.: Marking and control of food safety
Bařinka, S.: The procedure of the integrated rescue system if leak of chromium oxide in Groz - Beckert Czech Ltd.
Auxtová, S.: Procedures in the investigation of occupational accidents, hazardous occurrences and suspected occupational diseases among staff of Slovak Post
Švehla, M.: Assessment of the safety at logistics department in the manufacturing plant
Čapkovičová, L.: Safety assessment for agricultural association Radošovce – Paderovce
Putalová, M.: Assessment of workplace safety undercarriage lines in the company ZOŠ Trnava, a.s.
Kačíková, L.: Safety assessment on the welding station in the enterprise PCA Slovakia, s.r.o.
Kotúčková, M.: Safety assessment in the company of plastic granules UCC, Voderady
Novák, V.: Evaluation of physical and chemical factors of working environment in selected company
Chovancová, K.: Noise Check in the Chosen Space in Grammar School of Angely Merici in Trnava
Grebeči, J.: Assessment of safety weathering in cultural events held outdoors
Královiič, M.: Fire risk assessment of diesel by cone calorimeter method for forensic purpose
Selič, V.: Evaluation of the capacity in the packed grey cement manufacturing process
Kukuľová, M.: Assessment of the capability of the process of production of the bumpers
Drottner, P.: Capability assurance of production process of reflective films
Horúcka, M.: Assessment of influence water to insulation resistance of PVC cables
Zabáková, M.: Assessment of the impact of aging foaming concentrates on their selected properties
Stano, F.: To impact assessment of particle size on the ignition temperature of coal-dust cloud
Lužáková, L.: Furniture surface treatment- workplace with potential fire emergency in the Department STOLÁRSTVO – Michal Martinkovič, Sekule
Vypušťák, Ľ.: Requirements for safety operation of the indoor swimming pool
Žemlová, J.: The dust, as one of the risk factors occurring in agriculture
Šimurka, P.: Probabilistic fire analysis of nuclear power plant MO34
Král, L.: Linking Safety and Occupational Health Management System and Business Continuity Management System in the Integrated Management System
Štetinová, R.: Transport of dangerous goods exempted of the ADR in conditions of the chosen company
Mikulčík, R.: Operational safety of unit transformer 1AT01 in Nuclear Power Plant Jaslovské Bohunice
Srniak, J.: Industrial production of biogas
Hornický, J.: Problems of noise as a risk factor for the selected workplace for regulation of the Railways Slovak Republic
Jankechová, M.: Project of implementation 5S method
Ančicová, N.: Improvement project of application of traceability principles in production of rolling-element bearings
Drábik, M.: Project of Increasing of LPA Audits Efficiency by Means of Kamishibai in Martinrea Slovakia Fluid Systems, Co. Ltd.
Drhová, J.: Solving ergonomical risks related to performing work on selected machinery
Dávidová, Z.: Self-assessment as a tool to streamline the TQM process
Klokner, P.: Self-assessment as a tool streamlining total quality management
Bako, R.: Observation of transfer heat from radiating heating source to the lignocellulosic materials
Poláková, Z.: Monitoring the process capability screwdriving during assembly of air conditioning units in the automotive industry
Kamhalová, R.: System and assessment of safety and health at work in GGB Slovakia s.r.o Sučany
Števík, I.: The study of reactions of foam polystyrol on the functioning of heat flow
Bátora, E.: Study of UV degradation of methylene blue in a photoreactor
Laurinčík, J.: Study of the influence advanced oxidation methods for the degradability of selected process liquids
Wachter, I.: Termogravimetric analysis and activation energy of ignition of plastic materials
Remišová, K.: The effect of the fire extinguishing agents based on water on plant germination
Polák, E.: Effect of heat flux on the time to ignition of wood-based materials
Petrík, P.: The Effect of the Thermal Flux on the Expanding of Intumecsent Coatings
Gerincová, S.: Effect of heat flux on flammability of board materials according to the thickness
Hudecová, K.: The Effect of Aqueous Gel on Initiation Time of Combustion of Wood
Sedláčková, L.: Drawing up the Quality manual for Laboratory of structural analyses
Ondrejička, M.: Production and the possibility of use a hydrogen generator as an alternative propulsion
Šroba, T.: Production of biodiesel from waste oil
Ľuptáková, J.: Study of the Impact of Cutting Conditions on the Circularity of a Turned Surface When Using the DoE Methodology
Valentová, H.: Research on the influence of cutting conditions on the Cylindricity turning surface DoE method
Hajdúch, J.: Exposure to hot materials and surfaces and the elements of prevention against fatal injuries
Nemčková, D.: Exploitation of analytical methods for determination of surfactants
Števanková, S.: The use of self-assessment for the improvement of the selected in company
Kadlečík, J.: Application of Statistic Methods in Planning Changes in Production Process
Polačková, J.: Using of the statistical methods for assessing of the boride layers
Dikejová, V.: Implementation of good laboratory praxis at chosen company
Mokrá, V.: Evaluation of photochemical degradation of naphtalene
Kravárik, I.: Report of air quality in selected region in case of selected indicators
Fedorco, J.: Assessment of the use of solar energy in the selected workplace
Kaščáková, D.: Improve management of complaints as part of the quality management system of an industrial enterprise
Holečková, L.: Improvement of the level of the complaint management in selected organization
Tóth, M.: Improving the manufacturing process for semi-automatic production line Sk-2
Labudová, Z.: Improving the manufacturing process of the product Polar C using DMAIC cycle
Jajcaj, R.: Pollution of extinguishing agents in Wildland Firefighting
Svátek, J.: Safety improvement of traction power feeding stations by modernizing technology
Niklová, P.: Increasing processes performance through workplace standardization in Martinrea Slovakia Fluid Systems, Ltd.

PhD Theses
Ševčíková, Janka: Safety and Environmental Risks in the Operation of Acid Tar Ponds
Bartošová, Alica: Study of the safe production of bioethanol from non-traditional sources
Galbičková, Blanka: Study of phenol degradation by using progressive methods
Šudý, Marián: Study of accelerating ozonization of selected organic pollutants
Pastier, Martin: Study of flammability of combustible organic dusts
Martonová, Ivana: Developing a methodology for the implementation of Total Quality Management and Business Process Reengineering

Habilitation Theses
Kuracina, Richard: Design of a uniform system for risk analysis and risk management

RESEARCH AT THE INSTITUTE

Areas of Research
- fire protection and fire prevention,
- modelling the impacts 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,
- explosion prevention of industrial dust.

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 determination 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 emergency plans in accordance with legislation. Risk assessment and risk analysis of fires in industry, implementation of occupational health and safety assessment series (OHSAS), (internal audits, preparation for certification audits) are also compiled.

Research studies
Research studies are conducted in the areas of fire hazard of polymers, wood, industrial powder and flammable materials 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 foaming agents 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 modelling and comparison of different types of modelling programs 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 utilisation of small hydro-energetic source in combination with solar equipment 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 the Occupational Health and Safety Assessment Series (OHSAS), consulting in the field of emergency planning and consulting in the utilisation of renewable sources of energy.

Areas of expertise
- Analysis of Fire Hazard of Industrial Dust
- Safety of Technological Processes and Systems
- Extinguishing Substances and Technologies
- Systems of Management of Safety and Occupational Health Protection according to the OHSAS 18 001
- System of Environmental Management according to the ISO 14 001
- Fire and Safety Engineering
- Flammable Liquids, Solids and Powder
- Work with Dangerous Substances
- Analysis and Risk Regulation with the Methods Checklist, Failure Modes and Effect Analysis, Hazard and Operability Study, Fault Tree Analysis
- Safety of Chemical Technologies
- Safety in Area of Explosive Substances and Explosions
- Fire Hazard Analysis
- Fire Safety of Buildings
- Alternative Energy Sources
- Air Emissions
- Processing with Waste
- Progressive Technologies of Water Cleaning
- Integration of Systems of Safety and Occupational Health Protection (BOZP), - Quality and Environment
- Environment Evaluation
- Explosion Prevention
- Risk Analysis
- Storage of Danger Substances – Toxicology of Substances including Risk Definition
- Prevention of Dangerous Industrial Accidents
- Implementation of the OHSAS and EMS Systems in Enterprises

PROJECTS OF THE INSTITUTE

Project Title	**Elearning as a Handbook of Health and Safety in Welding**
Coordinator	Ing. Zuzana Szabová, PhD.
Start Date	01/01/2013
End Date	31/12/2015
Programme	KEGA
Annotation	The project aims to create a comprehensive handbook on safety and health (OSN) and fire protection in the classic, special, modified and hybrid technologies, welding, brazing and thermal cutting of materials. The guide to health and safety in welding will be available on the Internet for students of all forms of study within elearning and for use by experts. The guide will be an important tool and source of information in assessing risks for a wide range of subjects using the technology of metallurgical bonding and cutting of materials. There will also be taken into account the effective application in existing social practice. The guide will simplify access to the information and bring a new perspective for solving practical problems of safety and health in welding.

Project Title	**Progressive methods of material firetechnical characteristics determination in fire engineering**
Coordinator	Prof. Ing. Karol Balog, PhD.
Start Date	24/10/2013
End Date	30/09/2017
Programme	APVV
Annotation	The contribution to research in the area of fire engineering is in accordance with world trends through the utilisation of the progressive methods for the determination of important firetechnical characteristics for the calculation and modelling of compartment fires. The characterisation and verification of the laboratory testing methods will utilise modern equipment for obtaining the unique material characteristics and their alterations due heat and fire. The behaviour of the solid and liquid materials will be predicted in the process of initiation and propagation of combustion on the ground. New methods will be applied for the determination of critical boundary conditions of testing for representative materials in the progressive material structures for the improving of outputs from the fire scenarios used.

Project Title	**Construction of an educational laboratory for fire reconstruction on a laboratory scale**
Coordinator	Ing. Jozef Martinka, PhD.
Start Date	01/01/2013
End Date	31/12/2015
Programme	KEGA
Annotation	Investigation of fires causes is one of the most difficult tasks for fire protection. Correctly determined the cause of the fire can be a thin line between justice and miscarriages of justice, and a key tool for the determination respectively. Verification of the fire cause is its reconstruction on a laboratory scale. Reconstruction of a fire on a laboratory scale is divided into the reconstruction of initiation and the reconstruction of progress (development) of the fire. Reconstruction of initiation gives an answer to the question whether a specific ignition sources could be the cause of the fire. Reconstruction of the fire development provides valuable data about the behaviour of materials and products in the fire under conditions similar to the fire. The basic assumptions for the applicability of laboratory tests for the reconstruction of fire are the proper selection, design and implementation of laboratory tests. Currently there is no specialised facility for the reconstruction of fire on a laboratory scale, and no training centre to prepare specialists for the execution of the tests in the Slovak Republic.

Project Title	**Studying the use of advance oxidative processes for metalworking fluids lifetime extension and for their following acceleration of biological disposal at the end of the life cycle**
Coordinator	prof. Ing. Maroš Soldán, PhD.
Start Date	VEGA
End Date	01/01/2014
Programme	31/12/2017
Annotation	The project follows the possibility of using low concentrations of O3 as a progressive method of hygienisation of MWFs during the period of their use in machining. It is for the purpose of extending the lifetime of MWFs, protection of the human operator of the machine by reducing the amount of biocide used and reduction of the used sources for their longer utilisation (economic, environmental and safety aspects). On the other hand, after the useful life of process fluids in the machine, the effects of the high concentration of O3 will be monitored (with the combination of other advanced oxidative processes mostly sonolysis and photocatalytical oxidative processes) to accelerate the biodegradation of MWFs (economic and environmental aspects). The decrease of organic substances content as well as the primary elimination of biocides will help the biological degradation of this type of waste. Both aims reflect the world trend of sustainability, decreasing substances toxicity and the increasing use of biological treatment of wastes.

VISITS OF STAFF MEMBERS TO FOREIGN INSTITUTIONS

Country	Employee
Czech Republic	Balog Karol, prof. Ing., PhD. Bartošová Alica, Ing., PhD. Blinová Lenka, Ing., PhD. Fiala Jozef, Ing., PhD. Gerulová Kristína, Ing., PhD. Lestyánszka Škůrková Katarína, Ing., PhD. Martinka Jozef, Ing., PhD. Michalíková Anna, Ing., CSc. Paulová Iveta, doc. Ing., PhD. Rantuch Peter, Ing., PhD. Rusko Miroslav, doc. RNDr., PhD. Sirotiak Maroš, RNDr., PhD. Urdziková Jana, Ing. Mgr., PhD.

Country	Employee
Poland	Balog Karol, Prof. Ing., PhD. Soldán Maroš, Prof. Ing., PhD.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Slovak Academy of Sciences / Slovak Botanical Society
doc. 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 27
Ing. Kristína Gerulová, PhD.

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

Slovak Standards Institute TC 31
Prof. Ing. Maroš Soldán, PhD.
Ing. Kristína Gerulová, PhD.

Slovak Standards Institute TC 39
Ing. Peter Rantuch, PhD.

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

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

Slovak Standards Institute TC 105
doc. Ing. Richard Kuracina, PhD.

Slovak Standards Institute TC 115
Ing. Pavol Čekan, PhD.

Slovak Academy of Sciences / Slovak Chemical Society
prof. Ing. Maroš Soldán, PhD.
doc. Ing. Richard Kuracina, Ph.D.
Ing. Anna Michalíková, PhD.

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

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

Slovak Geochemical Association
RNDr.Maroš Sirotiak, PhD.

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

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

Futurological Society in Slovakia
doc. RNDr. 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.
Ing. Zuzana Szabová, PhD.

European Network Education and Training in Occupational Safety and Health (ENETOSH)
Prof. Ing. Karol Balog, PhD.

International Association for Landscape Ecology
doc. RNDr. Miroslav Rusko, PhD.

PUBLICATIONS (THE MOST IMPORTANT PUBLICATIONS IN 2014)

List of publications contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

Martinka, Jozef - Chrebet, Tomáš - Balog, Karol: An assessment of petrol fire risk by oxygen consumption calorimetry. - **registered in: Web of Science, Master Journal List.** In: Journal of Thermal Analysis and Calorimetry. - ISSN 1388-6150. - Vol. 117, Iss. 1 (2014), pp. 325-332.

Martinka, Jozef - Hroncová, Emília - Chrebet, Tomáš - Balog, Karol: The influence of spruce wood heat treatment on its thermal stability and burning process. - APVV 0353-11. - **registered in: Web of Science, Master Journal List, Scopus.** In: European Journal of Wood and Wood Products. - ISSN 0018-3768(P). - ISSN 1436-736X(E). - Vol. 72, Iss. 4 (2014), pp. 477-486.

Rantuch, Peter - Chrebet, Tomáš: Thermal decomposition of cellulose insulation. - **registered in: Web of Science, Master Journal List.** - CC citácia. In: Cellulose Chemistry And Technology [elektronický zdroj]. - ISSN 0576-9787. - Vol. 48, Iss. 5-6 (2014), online, pp.461-467.

Rantuch, Peter - Balog, Karol: Thermogravimetric analysis of cellulose insulation and determination of activation energy of its thermo-oxidation using non-isothermal, model-free methods. - **registered in: Web of Science, Master Journal List**. In: Polymers for Advanced Technologies [elektronický zdroj]. - ISSN 1042-7147. - ISSN 1099-1581. - Vol. 25, Iss. 10 (2014), online, pp. 1169-1174

Blinová, Lenka - Fiala, Jozef - Balog, Karol: Biodiesel production from waste cooking oil in laboratory scale. - **registered in: Scopus.** In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 448-453 : 2013 International Conference on Renewable Energy and Environmental Technology (REET 2013), Jilin, China, 21 - 23 September 2013. - , 2014. - ISBN 978-303785912-4, pp. 1656-1659.

Blinová, Lenka - Bartošová, Alica - Sirotiak, Maroš: Unconventional type of biomass suitable for the production of biofuels. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 860-863 : 3rd International Conference on Energy, Environment and Sustainable Development (EESD 2013), Shanghai, China, 12 - 13 November 2013 (2014). - ISBN 978-303785972-8, p. 514-517.

Čekan, Pavol - Balog, Karol - Kuracina, Richard - Szabová, Zuzana - Harangozó, Jozef: Development of the hexagonal structure in the processes of improving vibration insulating properties of products. - **registered in: Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 525. - , 2014, pp. 536-540.

Fiala, Jozef - Kuracina, Marcel - Hrušovský, Ivan - Soldán, Maroš: Study of basic characteristics of hydrogen generator. - **registered in: Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 448-453 : 2013 International Conference on Renewable Energy and Environmental Technology (REET 2013), Jilin, China, 21 - 23 September 2013. - , 2014. - ISBN 978-303785912-4, pp. 3078-3081.

Fiala, Jozef - Kuracina, Marcel - Blinová, Lenka - Soldán, Maroš: Thermography diagnostics of photovoltaic panels. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 388-392.

Galbičková, Blanka - Belčík, Michal - Hrušovský, Ivan - Soldán, Maroš - Balog, Karol - Ševčíková, Janka: Hazard analysis in phenol removal from natural water sources. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 75-79.

Galbičková, Blanka - Blinová, Lenka - Soldán, Maroš: Using of AOP process for phenol removal from wastewater. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol.

864-867 : 3rd International Conference on Energy, Environment and Sustainable Development (EESD 2013), Shanghai, China, 12 - 13 November 2013 (2014). - ISBN 978-303785973-5, pp. 1690-1693.

Gerulová, Kristína - Tatarka, Ondrej - Štefko, Tomáš - Szabová, Zuzana - Fiala, Jozef: Effect of ozone application to microbial contaminated samples of in-use metalworking fluids. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 884-885. - , 2014, pp. 277-282.

Gerulová, Kristína - Buranská, Eva - Tatarka, Ondrej - Szabová, Zuzana: Preliminary Study of Ozone Utilization in Elimination of Bacterial Contamination in Metalworking Fluids. - **registered in: Web of Science, Scopus**. In: Key Engineering Materials. - ISSN 1013-9826. - Vol. 581. Precision Machining VII : 7th International Congress of Precision Machining (ICPM 2013), October 3 - 5, 2013, Miskolc, Hungary. - Durnten-Zurich : Trans Tech Publications, 2014. - ISBN 978-3-03785-840-0, pp. 143-147.

Gerulová, Kristína: Well-established biodegradation tests used biogenously evolved carbon dioxide as an analytical parameter to determine the ultimate biodegradability of metalworking fluids measured by the change of absorption solution conductivity. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 881-883. - , 2014, pp. 497-502.

Harangozó, Jozef - Balog, Karol - Szabová, Zuzana - Kuracina, Richard - Čekan, Pavol: Assessment of wood materials modified by flame retardants at loading by heat flux. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 272-275.

Horváth, Jozef - Balog, Karol - Scarafilo, Domenico: Hazards of explosibility dust from wood pellets. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 324-329.

Kuracina, Marcel - Fiala, Jozef - Soldán, Maroš: Study of selected characteristics of a dry cell hydrogen generator in conditions of long term operation. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 887-888. - , 2014, pp. 985-988.

Kuracina, Marcel - Fiala, Jozef - Soldán, Maroš: Study of selected characteristics of 8-cell HHO generator using various concentrations of NaOH solutions. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), p. 109-113.

Kuracina, Richard - Šandor, Denis - Balog, Karol: FTA - Fault Tree Analysis in Microsoft Excel. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 889-890. - , 2014, pp. 591-594.

Martinka, Jozef - Chrebet, Tomáš: Activation energy of teak and oak wood spontaneous ignition. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 262-266.

Martinka, Jozef - Chrebet, Tomáš - Hrušovský, Ivan - Balog, Karol - Hirle, Siegfried: Fire risk assessment of spruce pellets. - **registered in: Web of Science, Scopus**. In: Applied Mechanics and Materials. - ISSN 1660-9336. - Vol. 501-504 : 3rd International Conference on Civil Engineering and Transportation, ICCET 2013, Kunming, China, 14.-15.12.2013 (2014), pp. 2451-2454.

Soldán, Maroš - Blinová, Lenka - Fiala, Jozef - Galbičková, Blanka - Ševčíková, Janka - Kobetičová, Hana: Adsorption of phenol on red mud. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 864-867 : 3rd International Conference on Energy, Environment and Sustainable Development (EESD 2013), Shanghai, China, 12 - 13 November 2013 (2014). - ISBN 978-303785973-5, pp. 1759-1762.

Szabová, Zuzana - Balog, Karol - Belčík, Michal: Analysis of human factors applied to work activities of a welder in a small plant oriented to manufacture of weldments from recycled materials. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), p. 395-400.

Szabová, Zuzana - Pastier, Martin - Harangozó, Jozef - Chrebet, Tomáš: Determination of characteristics predicting the ignition of organic dusts. - **registered in: Web of Science**. In: Occupational Safety and Hygiene II : 10th Annual Congress of the Portuguese Society of Occupational Safety and Hygiene on Occupational Safety an Hygiene (SPOSHO) Guimaraes, Portugal, 13 - 14 February 2014. - Boca Raton : CRC Press, 2014. - ISBN 978-1-315-77352-0. - ISBN 978-1-138-00144-2. - pp. 143-145.

Štefánková, Jarmila - Balog, Karol - Rakšany, P.: Evaluation of the security situation abroad by the FMEA method and impact of natural or technical threats on the environment. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 469-474.

Šudý, Marián - Balog, Karol - Soldán, Maroš: Environmental friendly degradation of Atrazine by ozone and identification of main degradation products. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 52-57.

Tureková, Ivana - Szabová, Zuzana - Chrebet, Tomáš - Harangozó, Jozef: The effect of external conditions on ignition temperature thermoplastic polyurethane elastomers. - ITMS 26220120048. - **registered in: Web of Science, Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 838-841 : 2nd Global Conference on Civil, Structural and Environmental Engineering (GCCSEE 2013), Shenzhen, China, September 28-29, 2013. - , 2014, pp. 14-17.

Zigo, Jaroslav - Rantuch, Peter - Balog, Karol: Experimental analysis of minimum ignition temperature of dust cloud obtained from thermally modified spruce wood. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 919-921. - , 2014, pp. 2057-2060.

Zigo, Jaroslav - Rantuch, Peter - Balog, Karol: Thermal decomposition of loose-fill cellulose thermal insulation. - **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 379-382.

Rabenda, Andrzej - Kowal, Edward - Balog, Karol: Work hygiene - selected issues. - 1. vyd. - Zielona Góra : Uniwersytet Zielonogórski, 2014. - 162 p. - ISBN 978-83-7842-093-4

Martinka, Jozef - Hrušovský, Ivan - Chrebet, Tomáš - Rantuch, Peter: Study of selected natural materials ignitability. – **registered in: Scopus**. In: Advanced Materials Research. - ISSN 1022-6680(P). - ISSN 1662-8985(E). - Vol. 1001 (2014), pp. 201-261.

This part of Annual Report 2014 was verified by prof. Ing. Karol Balog, PhD.

RESEARCH CENTRE OF PROGRESSIVE TECHNOLOGIES

CONTACT

Director
Dr. h. c. Prof. Dr. Ing. Oliver Moravčík
e-mail: oliver.moravcik@stuba.sk
tel.: +421918646065

Deputy directors
doc. Ing. Maximilian Stremy, PhD.

Address Hajdóczyho 1, 917 24 Trnava, Slovak Republic
tel.: +421906068300
fax.: +421906068499

STAFF

- Professors:	3
- Assoc. Professors:	2
- Research Fellows:	18
- Administration:	1

ACTIVITIES OF THE CENTRE

Date	Title of event or activity of the Centre in 2014
23/04/2014	Project submitted within H2020, as a coordinator: "Improving cognitive skill of an industrial robot"
29/04/2014VEGA	Project 1/0465/15 "Design of Al-TM alloys for on-board hydrogen production"
30/04/2014	KEGA Project 1/0841/15 "Research into utilising progressive technologies for adaptive testing of knowledge and determining the personality profile, suitable also for the disabled"

07/05/2014	Project submitted within H2020: "Lead/Polymer bipolar battery"
28/08/2014	Project submitted within H2020: "Innovative Emergency Services'
28/08/2014	Project submitted within H2020: "Citizen drivens security in the large urban environment"
28/08/2014	Project submitted within H2020: "Improving cooperation betwen LEA agencies and citizens"
17/09/2014	Project submitted within H2020, as a coordinator, within the TEAMING Call: "SlovakION -Slovak Centre of Excellence in Ion Beam and Plasma Technologies for Materials Engineering and Nanotechnology". The project was approved by the European Commission and will be granted EU funds.
17/09/2014	Project submitted within H2020, as a coordinator, within the ERA CHAIR Call: "Cultivate Excellence in MIcro- and NAno-structured materials research at the Slovak University of Technology"
8/09/2014	Project submitted within H2020: "Quasi solid-state lithium-chalcogenide bipolar battery"
7/10/2014	Project submitted within H2020: "Quasi solid-state bipolar cell"
14/10/2014	Project submitted within H2020, as a coordinator PHC11:"Neuroplasticity"
26/11/2014	Projects submitted within APVV: "Early detection and identification of anomalies in the chemical regime of water in a Nuclear Power Plant, using methods of artificial intelligence" "Citizen-initiated safety through innovative tools in the Slovak Republic" "Research into the factors affecting the citizens' feeling of (un) safety of and the possibility of increasing the feeling" "Nanostructural changes induced by heavy ion irradiation with energies up to 50 MeV"
19/12/2014	Framework Agreement on Cooperation between the STU MTF and IFW Dresden

RESEARCH IN THE CENTRE

The Research Centre of Progressive Technologies (Slovak University of Technology in Bratislava, Faculty of Materials Science and Technology in Trnava) is primarily focused on Materials Engineering in the field of ion and plasma Technologies, Automation and ICT implementation in industrial processes and research field e.g. nanotechnology and nanostructures, sensorics, specific hardware and software development, bioengineering and health, vision and processing, big data, humanoids, simulation and modelling. The area of Materials research will include theoretical modelling using ab-initio methods, either at a very accurate level treating small systems at the molecular scale, or DFT methods concerning bulk materials and surfaces. The area of Automation and ICT implementation will also provide space for research and development in a wide range of hardware, communication and management of automated software tools, knowledge based systems, archiving and distribution of knowledge of higher-level systems.
The Research centre comprises of two new buildings for the purposes of research, located on the campus. Research centres:
1/ Scientific Centre of Materials Research with laboratories focused on:
ion beam technologies, plasmatic modification and deposition, analytical methods, computational modelling.

2/ Scientific Centre of Automation and ICT Implementation in Production Processes and related laboratories, comprised of the:
control systems, ICIM, information integration and control systems, artificial intelligence, bioengineering, medicine/health, chemistry etc.

The further activities of the centre are:
Applied research in the above-mentioned research centres and the research fields, e.g.:
- Quantum chemistry, Benchmarking, Materials technology, Nanotechnology and Nanosciences, Nuclear fission, Nuclear fusion, Hydrogen and fuel cells, Radioactive waste, Climate change and Carbon cycle research, Radiation protection,
- Artificial intelligence, machine learning, human-robot interaction etc.,
- Big data, Business intelligence, data mining, knowledge discovery,
- Vision and image processing, evaluation,
- Microelectronics and hardware development, microchips,
- Sensor technology, tyres, drives, controlling and control systems, industrial communication technologies,
- Software development (GIS, Telemetric systems),
- Verifications and SW testing,
- Mathematical models and representations (systems with quick feedback).

Support to transfer the advanced technologies into practice, transfer of know-how, innovations and knowledge from the academic environment into practice and providing support for start-up and spin-off activities.

PROJECTS OF THE CENTRE

Name of project	**Human Resources Development in the field of research and development for the UVP-CAMBO**
ITMS of project	26110230116
Duration of project	10/2013-06/2015
Operational programme	OPV-2013/1.2./07-SORO
Annotation	In October 2013, 14 researchers and operators were sent to Helmholtz-Zentrum Dresden Rossendorf to attend a 2-year educational programme within the working groups oriented on materials research and projects on the utilisation of ion beams. Their knowledge is being theoretically enhanced by attending specialised lectures and on-site training to use the unique equipment. The intention is that they will continue their scientific work in the Workplace of Materials Research after the construction of Slovakion is accomplished.

Name of project	**University Scientific Park „CAMPUS STU MTF" - CAMBO**
ITMS of project	26220220179
Duration of project	03/2013-06/2015
Operational programme	OPVaV - 2012/2.2/08-RO
Annotation	The aim is to build a university research workplace of excellence of international importance in the field of Materials research and ion technologies as well as information science, automation, modelling and chemistry. Specific objectives of the project: **Applied research within the research workplaces** 1. Research workplace of Materials research. Building a workplace of European importance specialised in advanced **ion and plasma technologies**. 2. Research workplace of automation and ICT implementation in production processes and systems with laboratories. **Support for modern technologies transfer into practice** in the form of academic know-how, innovations and knowledge transfer into practice, start-ups, and spin-offs.

Name of project	**Implementation of an internal quality assurance system in education**
ITMS of project	26110230042
Duration of project	01/2012-07/2014
Operational programme	Operational programme of education
Annotation	The aim of the project is to design and verify the system of objective quality assessment, effectiveness and purpose of education in order to achieve sustainable adaptation of universities to the topical and perspective needs of the knowledge society. The project will enable the implementation of the system of direct quality measurement of university education with the aim of providing a space for improving the quality of the university institution output and approximation of the education system to the societal needs.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Slovak Physical Society
doc. Ing. Stanislav Minárik, PhD.
doc. Ing. Róbert Riedlmajer, PhD.

International Federation of Automatic Control IFAC, branch of the Slovak Society of Cybernetics and Informatics, SAV
doc. Ing. Maximilián Strémy, PhD.

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

European Physical Society
doc. Ing. Róbert Riedlmajer, PhD.

North-Atlantic Consortium on Non-Oxide Glasses (NACNOG)
doc. Ing. Stanislav Minárik, PhD.

IRSN - Institut de Radioprotection et de Sûreté Nucléaire, Cadarache, France
RNDr. Katarína Šulková, PhD.

IRSN - Institut de Radioprotection et de Sûreté Nucléaire, Cadarache, France
RNDr. Martin Šulka, PhD.

International Association of Computer Science and Information Technology IACSIT
doc. Ing. Maximilián Strémy, PhD.

PUBLICATIONS (MOST IMPORTANT PUBLICATIONS IN 2014)

List of publications contains authentic translations of the titles into English in the original wording as translated by the Institute, i.e. without English language proofreading.

ADF HRDINOVÁ, Gabriela - MORAVČÍK, Oliver - SAKÁL, Peter - ŠTEFÁNKOVÁ, Jana. Why it is necessary to change the strategies of unlimited economic growth to the strategies of sustainable development. In: Výkonnosť podniku (Company efficiency), Vol. 4, No. 1 (2014), pp. 53-68. Project: 037STU-4/2012 106.

AFC ŠTEFÁNKOVÁ, Jana - MORAVČÍK, Oliver - PORVAZNÍK, Ján. Application of Competence Models in Terms of University Management. Reading: Academic Conferences and Publishing International Limited, 2014. In Intellectual Capital, Knowledge Management and Organisational Learning, ICICKM 2014: Proceedings of the 11th International Conference. Australia, Sydney, 6-7 November 2014, pp. 374-383. ISBN 978-1-910309-71-1.

ADE SVETSKÝ, Štefan - MORAVČÍK, Oliver. The automation of teaching processes based on knowledge processing. In Transactions on Machine Learning and Artificial Intelligence [electronic source], Vol. 2, iss. 5 (2014), online, pp. 60-72. Project: 047STU-4/2012 106.

BCI SAKÁL, Peter - HRDINOVÁ, Gabriela - MORAVČÍK, Oliver - ŠTEFÁNKOVÁ, Jana. Sustainable Corporate Social Responsibility [electronic source]: Proposal of methodology for building a Sustainable Social Responsibility system within 3E model of HCS concept. 1st edition Trnava: AlumniPress, 2014. CD-ROM, 256 p. Available on the Internet: https://is.stuba.sk/auth/dok_server/ slozka.pl?id=71208;download=98595. ISBN 978-80-8096-198-5. Project: 037STU-4/2012 106.

AFC JUHÁS, Martin - MORAVČÍK, Oliver - JUHÁSOVÁ, Bohuslava - ŠUTOVÁ, Zuzana. Sensitivity analysis of mechatronic system with flexibility control. In: 16th Mechatronika (Mechatronics) 2014. 1st ed. 1 CD-ROM. ISBN 978-80-214-4817-9 Mechatronika (Mechatronics) 2014. Brno: University of Technology, 2014, pp. 209-215. Project: 1/0463/13 113.

AFC DELGADO SOBRINO, Daynier Rolando - MORAVČÍK, Oliver. Layout modifications and subsequent material flow analyses supported by the use of simulation: Proposal of steps and partial application at an assembly cell. In COMEC 2014. 1st edition. ISBN 978-959-250-997-9 AFC

PETERKOVÁ, Andrea - STRÉMY, Maximilián. Proposed system for human fall detection using kinect sensor. Zielona Góra: University of Zielona Góra, 2014. In IDS 2014. International Doctoral Seminar 2014 [electronic source]: Proceedings of the 9th International Doctoral Seminar (IDS 2014), Zielona Góra, Poland, May 19 -21, 2014, pp. 168-173. ISBN 978-80-8096-195-4. Project: 26220220179 268.

BFB PETERKOVÁ, Andrea - STRÉMY, Maximilián. Traditional and e-learning approaches to the learning process in the field of artificial intelligence. Trnava: STU MTF, 2014. In: Development and implementation of academic competences of doctoral syudents in technical sciences, Reviewed Proceedingsof the International Doctoral Conference, pp. 108-109. ISBN 978-80-8143-144-9.

ADM MICHAĽČONOK, German - NÉMETH, Martin - STRÉMY, Maximilián. Influence of random components of the sampling period on the combined dynamic system. In Applied Mechanics and Materials. ISSN 1660-9336, Vol. 693 (2014), pp. 80-85. Project: 26220220159 268.

ADF STRÉMY, Maximilián - PETERKOVÁ, Andrea. Comparison of machine learning methods for the purposes of human fall detection. In Vedecké práce MtF STU v Bratislave so sídlom v Trnave (Research papers of the Slovak University of Technology, Faculty of Materials Science and Technology in Trnava). ISSN 1336-1589, Vol. 22, No. 35 (214), pp. 69-76. Project: 26220220179 268.

AFC JUROVATÁ, Dominika - VAŽAN, Pavel - KEBÍSEK, Michal - TANUŠKA, Pavol - HRČKA, Lukáš. Prediction of selected production goals by classification methods. In Applied Mechanics and Materials, Vol. 474 (2014), pp. 115-120. In database: WOS; SCOPUS. Project: 1/0214/11 113.

AAB JUROVATÁ, Dominika. Utilising the process of knowledge acquisition in the field of the production processes control [electronic source]. 1st edition. Trnava: AlumniPress, 2014. online, 95 p. Available on the Internet: <http://www.mtf.stuba.sk/docs//doc/veda_a_vyskum/monografie/VM_Jurovata.pdf ><https://is.stuba.sk/vv/pub_priloha.pl?id=297306>. ISBN 978-80-8096-199-2.

ADF JUROVATÁ, Dominika. Komparatívna štúdia simulačných nástrojov Plant Simulation a Witness (Comparative study of the Plant Simulation and Witness simulation tools). In Fórum manažéra. ISSN 1336-7773, No. 1 (2014), pp. 21-28.

ADF JAKÁBOVÁ, Martina - JUROVATÁ, Dominika - BEŇO, Rastislav - DOHNÁLOVÁ, Simona - ZELENAY, Tomáš. Developing the e-learning materials for the concept of "Digital Company". In Fórum manažéra (Forum of manager). ISSN 1336-7773.

ADM JUROVATÁ, Dominika - VAŽAN, Pavel - HRČKA, Lukáš - KURNÁTOVÁ, Júlia. Input control in production system by simulation optimization. In Applied Mechanics and Materials. ISSN 1660-9336, Vol. 693 (2014), pp. 117-122.

ADF VAŽAN, Pavel - JUROVATÁ, Dominika - HRČKA, Lukáš - DANEK, Maroš. Modelling the traffic system. In Vedecké práce MtF STU v Bratislave so sídlom v Trnave. Research papers of the Slovak University of Technology Faculty of Materials Science and Technology in Trnava. ISSN 1336-1589, Vol. 22, No. 35 (214), pp. 31-38. Project: 26220220179 268.

AFD BOŽEK, Pavol - PETERKA, Jozef - BEZÁK, Pavol - BURANSKÝ, Ivan. Robotic system teaching application. In ICETA 2014. 1. vyd. 1 CD-ROM. ISBN 978-1-4799-7738-3 IEEE International Conference on Engineering eLearning Technologies and Applications. [S. l.] : IEEE, 2014, PP. 57-62. Project: 047STU-4/2012 106.

ADE BEZÁK, Pavol - NIKITIN, Ju. R. - BOŽEK, Pavol. Robotic grasping system using convolutional neural networks. In American Journal of Mechanical Engineering [elektronický zdroj]. ISSN 2328-4110, Vol. 2, no. 7 (2014), online, pp. 216-218.

AFC BEZÁK, Pavol - BOŽEK, Pavol - NIKITIN, Jury. Advanced robotic grasping system using deep learning. In Procedia Engineering. 2014, Vol. 96 (2014), online, pp. 10-20.

AFC JUHÁS, Martin - JUHÁSOVÁ, Bohuslava - HALENÁR, Igor - ELIÁŠ, Andrej. Proposal to increase the efficiency, reliability and safety of the centre of data collection management and their evaluation using cluster solutions. Waset, 2014. In World Academy of Science, Engineering and Technology. International Journal of Computer, Information, Systems and Control Engineering. Vol. 8, No. 6, 2014 [elecktronic source] : ICCSET 2014: International Conference on Computer Science, Engineering and Technology, Toronto, Canada, June 16-17, 2014, CD-ROM, pp. 829-833. Project: 26220220159 268.

AFC TANUŠKA, Pavol - ELIÁŠ, Andrej - VAŽAN, Pavel - ZAHRADNÍKOVÁ, Barbora. The nuclear power plant environment monitoring system through mobile units. In World Academy of Science, Engineering and Technology: International science index: Vol: 8, No: 12, 2014, Part V: WASET, 2014, pp. 618-621. ISSN 1307-6892. Project: 26220220159 268.

ADC ŠULKA, Martin - CANTREL, L. - VALLET, V. Theoretical study of plutonium (IV) complexes formed within the PUREX process: A proposal of a plutonium surrogate in fire conditions. In Journal of Physical Chemistry A, Vol. 118, iss. 43 (2014), pp. 10073-10080.

AFD MARTINKOVIČ, Maroš - MINÁRIK, Stanislav. Evaluation of grain deformation in polycrystals. In Materials Science Forum Vol. 782 (2014) pp 41-44 © (2014) Trans Tech Publications, Switzerland doi : 10.4028/www.scientific.net/ MSF.782.41. Database: SCOPUS; WOS.

AFC SELIGA, Emil - MINÁRIK, Stanislav - BOŠÁK, Ondrej - LABAŠ, Vladimír - KUBLIHA, Marián - HRONKOVIČ, Ján. Determination of adverse effects on rubber compounds based on SBR/NR by measurements of rheological properties. In IDS 2014. International Doctoral Seminar 2014 [electronic source]: Proceedings of the 9th International Doctoral Seminar (IDS 2014), Zielona Góra, Poland, May 19 -21, 2014. 1st edition. Zielona Góra: University of Zielona Góra, 2014, pp. 200-205. ISBN 978-80-8096-195-4.

AFC SELIGA, Emil - BOŠÁK, Ondrej - MINÁRIK, Stanislav - LABAŠ, Vladimír - DOMÁNKOVÁ, Mária. Influence of selected external conditions on vulcanisation of SBR/NR rubber compounds. In XXVII. DIDMATTECH 2014 [electronic source]: Olomouc. Czech Republic, 19-20/06/2014. 1st edition. Olomouc: Gevak, 2014, CD-ROM, p. 64-67. ISBN 978-80-86768-88-5.

ADC Bílek, Pavel - Jurči, Peter - Hudáková, Mária - Pašák, Matej - Kusý, Martin - Bohovičová, Jana: Cr2N-7Ag nanocomposite thin films deposited on Vanadis 6 tool steel. - ITMS 26220120048. - registered: Web of Science, Master Journal List, Scopus. In: Applied Surface Science. - ISSN 0169-4332. - Vol. 307 (2014), pp. 13-19

ADM Jurči, Peter - Bohovičová, Jana - Hudáková, Mária - Bílek, Pavel: Characterization and wear performance of CrAgN thin films deposited on Cr-V ledeburitic tool steel. - Registered: Web of Science, Master Journal List, Scopus. In: Materiali in Tehnologije. - ISSN 1580-2949. - Vol. 48, Iss. 2 (2014), pp. 159-170

AFC JANČÍKOVÁ, Zora - BOŠÁK, Ondrej - ZIMNÝ, Ondřej - LEGOUERA, Messaoud - MINÁRIK, Stanislav - KOŠTIAL, Pavel - POULAIN, Marcel - SOLTANI MOHAMED, Toufik. The neural network analysis of optical glasses transmittance. In ICCC 2014: 15th International Carpathian Control Conference, 28 - 30 May 2014, Velké Karlovice, Czech Republic. 1st edition. Piscataway: IEEE Computer Society, 2014, pp. 196-200. ISBN 978-1-4799-3528-4. In database: SCOPUS.

Adamech, M.; Cernickova, I.; Duriska, L.; Kolesar, V.; Drienovsky, M.; Bednarcik, J.; Svoboda, M. ; Janovec, J.: Formation of less-known structurally complex zeta(b) and orthorhombic quasicrystalline approximant epsilon(n) on solidification of selected Al-Pd-Cr alloys. MATERIALS CHARACTERIZATION, Volume: 97 pp. 189-198 Published: NOV 2014

Cernickova, Ivona; Svec, Peter; Watanabe, Shinichi; Caplovic, Lubomir; Mihalkovic, Marek; Kolesar, Vladimir; Priputen, Pavol; Bednarcik, Jozef; Janickovic, Dusan; Janovec, Jozef: Fine structure of phases of epsilon-family in Al73.8Pd11.9Co14.3 alloy. JOURNAL OF ALLOYS AND COMPOUNDS Volume: 609 pp. 73-79 Published: OCT 5 2014

Kolesar, V.; Priputen, R.; Bednarcik, J.; Cernickova, I.; Svoboda, M.; Drienovsky, M.; Janovec, J.: Evolution of phases in Al55Ni30Pd15 alloy at temperatures up to 600 degrees C. INTERMETALLICS Volume: 46 pp.: 141-146 Published: MAR 2014

Kolesar, V; R. El Kammouni, M. Kubliha, V. Labas, M. Vazquez: Mechanical oscillations in multilayer magnetic microwires induced by Joule heating. Proceedings of the IEEE International Magnetics Conference, Intermag 2014, 4 - 8 May 2014, Dresden, Germany

RUGEL Georg, AKHMADALIEV Shavkat, MERCHEL Silke, PAVETICH Stefan, RENNO Axel D., WIEDENBECK Michael, NOGA Pavol, ZIEGENRÜCKER René. Setting-up a Super-SIMS at DREAMS, AMS13 The Thirteenth International Conference on Accelerator Mass Spectrometry, 24-29 August 2014, Aix en Provence, France

Conferences:

ŠULKOVÁ, Katarína - CANTREL, Laurent. - LOUIS, Florent. A theoretical study of the kinetics of gas-phase elementary reactions containing caesium species of nuclear safety interest. In Book of abstracts. 1st edition 84 p. ISBN 978-963-313-132-9 Central European symposium on theoretical chemistry. Budapest, Hungary.

Marcel Meško, René Heller, René Hübner, Matthias Krause: Influence of the discharge regime on the Ti thin films growth and properties in dc, single pulsed and chopped high power impulse magnetron sputtering. 14th International Conference on Plasma Surface Engineering (PSE 2014), Garmisch-Partenkirchen, Germany, 15/09–19/09/2014

This part of Annual Report 2014 was verified by Dr. h. c. Prof. Dr. Ing. Oliver Moravčík

DIVISION OF COMMUNICATION AND INFORMATION SYSTEMS

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
tel.: +421 33 55 11 033

STAFF

13

PRIORITIES OF THE DIVISION

1. The Division of Communication and Information Systems is a technical-admin istrative and service Faculty unit which provides procedural, consultative and informational services in the area of communication and information technology to other organisational units of the Faculty. This division prepares documents for the 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 the Faculty computer systems,
   b) provision of on-going maintenance and repairs to devices of the Faculty information technology and infrastructure,
   c) provision of consultation services for the system and the 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 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) ad-hoc repairs of technical devices as required,
   i) support for cooperation with the Centre of Information Technology STU and other information workplaces at STU,
   j) provison 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 activities,
   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 systems.

PROJECTS OF THE DIVISION

The Head of the Division, Ing. Jaroslav Otčenáš contributes to the project (2013-2015) **"Knowledge-based Faculty for economic practice".**

Ing. Pavol Závacký contributes to the project (2013-2015) **"Knowledge-based faculty for economic practice".**

ACTIVITIES OF THE DIVISION IN 2014

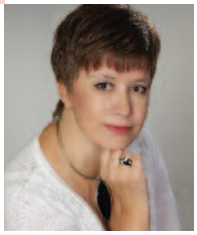
- building a database of offers for cooperation with practice,
- Wi-Fi coverage for the student dormitory,
- developing web portals for Faculty needs (www.idssmolenice.sk), dokumenty.mtf.stuba.sk and foto.mtf.stuba.sk), campus.mtf.stuba and new system for student dormitory,
- active help in organising 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,
- administration of the mobile data centre with server and storage backend technologies,
- network intrusions detection and prevention,
- servers installation and maintenance,
- Wi-Fi access points administration (Cisco WLC),
- implementation of system for net points regulation (LMS),
- management of UPS 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 the whole faculty.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

SANET – Slovak Academic Network

This part of Annual Report 2014 was verified by Ing. Jaroslav Otčenáš

DIVISION OF ACADEMIC ACTIVITIES



CONTACT

Head of the Division Ing. Jana Štefánková, Ph.D.
e-mail: jana.stefankova@stuba.sk
tel.: +421 918 646 073

Address Paulínska 16, 917 24 Trnava, Slovak Republic
tel.: +421 33 5511 033

SECTIONS

Registrar's Section
Section of Research and International Relations

STAFF 13

PRIORITIES OF THE DIVISION

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.

PROJECTS OF THE DIVISION

The Head of the Division, Ing. Jana Štefánková, Ph.D. contributes to the project (2013-2015) **"Knowledge-based Faculty for economic practice"**.

The Head of the Division, Ing. Jana Štefánková, Ph.D. is involved in the **National project "Universities as motors of the knowledge-based society development"**.

ACTIVITIES OF THE DIVISION IN 2014

- Organisation of the International Doctoral Seminar 2014 in Poland
- Organisation of the Students Research Conference at the Faculty 2014
- Job Day 2014
- Organisation of the "Open-house Day at STU MTF"
- Organisation of promotional activities, presentation events and preparation of collated materials for study
- Supporting the "Doctoral Week" event
- Participation at education trade fairs in Brno, Bratislava and Nitra
- 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 and publishing information for Faculty employees and students throughout the year.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

The Slovak Academy of Management
Ing. Jana Štefánková, Ph.D.

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

SEFI- European Society for Engineering Education
Ing. Jana Štefánková, Ph.D.

PUBLICATIONS

Hrdinová, Gabriela - Moravčík, Oliver - Sakál, Peter - Štefánková, Jana: Why is it necessary to change the strategies of unlimited economic growth to sustainable development strategies . In: Výkonnosť podniku (Enterprice efficiency). - ISSN 1338-435X. - Vol. 4, No. 1 (2014), pp. 53-68

Štefánková, Jana - Moravčík, Oliver - Porvazník, Ján: Application of Competence Models in Terms of University Management.
In: Intellectual Capital, Knowledge Management and Organisational Learning (ICI-CKM 2014) : Proceedings of the 11th International Conference. Australia, Sydney, 6-7 November 2014. - Reading : Academic Conferences and Publishing International Limited, 2014. - ISBN 978-1-910309-71-1. - pp. 374-383

Sakál, Peter - Hrdinová, Gabriela - Moravčík, Oliver - Štefánková, Jana: Sustainable Corporate Responsibility [electronic resource]: methodology concept of developing the system of CSR strategy in the context of the concept HCS model 3E. - 1. ed. - Trnava : AlumniPress, 2014. - CD-ROM, 256 p. - e-textbook. - ISBN 978-80-8096-198-5

This part of Annual Report 2014 was verified by PhDr. Kvetoslava Rešetová, PhD.

DIVISION OF KNOWLEDGE MANAGEMENT

CONTACT

Head of the Division PhDr. Kvetoslava Rešetová, PhD.
e-mail: kvetoslava.resetova@stuba.sk
tel: +421915847111

Address Jána Bottu 25, 91724 Trnava, Slovak Republic
tel: +421906068300

SECTIONS

Academic Library
Publishing House
Public Relations

STAFF 12

PRIORITIES OF THE DIVISION

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; fulfilment of the role as a specialised research library for the specific fields of the Faculty.
   b) operation of the Faculty publishing house and the provision of editorial activities: implementing the changes of the statute of editorial activity, including administration of anonymous reviewing, mapping the publication space in the publishing opportunities; updating and administering the publishing portal of MTF.
   c) public relations activities of the Faculty: activities related to promotion of the Faculty in the media; responsibility for the website and monitoring of the news; website of the Faculty; schedule providing information on the Faculty events; preparation of the Annual Report; regular announcements in print media; organisational support for events at the Faculty and video -recordings of events; acquisition of the technology museum; update of the MTF photo-gallery portal; innovation of poster display; production of invitations, business cards, leaflets and posters.
   d) acting as a point of contact between the Faculty and the alumni society: activity to support the Bank of Quality - Alumni MTF society.

PROJECTS OF THE DIVISION

Knowledge-based Faculty for economic practice
The Project is established within the Operational Programme of Education and financed from the European Social Fund. **ITMS 26110230113**

Modern Education for Knowledge Society / Project co-financed from the EU funds.

Time period of the Project: 10/2013 – 9/2015. Principle investigator of the Project:
PhDr. Kvetoslava Rešetová, PhD.

Aims of Project
Developing the tools and partner environment of the knowledge-based Faculty for economic practice
The project is focused on developing the tools and mechanisms for building a partner environment of a knowledge-based Faculty for economic practice. Needs analysis is based on the long-term Faculty goals of increasing the degree of responsibility for knowledge transfer, and development of the knowledge-based society. It concerns the integrity of education and innovations through the development of intellectual capital and knowledge potential of the Faculty. The quality of the knowledge and intellectual potential of the institution as well as the intensity of its development are both associated with knowledge management. Transfer of knowledge represents a review of the status of knowledge in the value hierarchy of the Faculty. Tools for developing the innovative forms of the research, development and education results transfer determine the added value of the cognitive and transformation processes at the Faculty. The project maps the outcomes for

the development of collaboration with economic practice and the impact of environment on the collaboration, and simultaneously creates tools for the knowledge transfer into education. The project seeks to increase the quality of education and human resources development in the fields of research and development, in order to achieve continuous adaptation of higher education institutions to the current and future needs of the knowledge society.

Sustainability of the Project results
The STU Faculty of Materials Science and Technology is well prepared to provide the wider community of economic practice with the latest information gained in the process of education and research. It has potential for value creation. It develops the means for integration of its activities and relationships with relevant partners, while bearing responsibility for the personal development of PhD students, particularly in terms of their future career societal needs. Increased demand of practice for knowledge is an incentive for the Faculty to streamline the transfer of the research and development results into the economic sphere, so as to improve the motivation of scientists to collaborate with practice, and simultaneously strengthen the Faculty's traditional mission. The sustainable environment of the STU MTF relationship with economic practice is a firm concept of the Faculty development based on the optimum coexistence of the base and applied research, innovative teaching and effective cooperation between the University and industrial sphere.

ACTIVITIES OF THE DIVISION IN 2014

Building a Database of offers for cooperation with practice

Academic Library
- implementation of the new Information System for Library (Advanced Rapid Library)
- organisation of the Book Week as part of the International Book Day event,
- regular navigation in the electronic information sources.

Publishing House
- coordination of the process to add the Faculty journals to the Versita system,
- mapping the publication space in the publishing opportunities.

Department of Public Relations
- supplying information to the webpage of the University Research Park,
- displays at the exhibitions: International Engineering Fair in Brno (Czech Republic),
- organisation of the Faculty activities guaranteed by the division.

MEMBERSHIP OF SLOVAK PROFESSIONAL ORGANISATIONS

Slovak Association of Libraries
– membership of the whole academic library

Slovak Association of Publishers and Booksellers
– Office of the AlumniPress

MEMBERSHIP OF INTERNATIONAL PROFESSIONAL ORGANISATIONS

KMPro (Knowledge Management Professional Society)
PhDr. Kvetoslava Rešetová, PhD.

ATRIP (International Association for the Advancement of Teaching and Research in Intellectual Property)
PhDr. Kvetoslava Rešetová, PhD.

PUBLICATIONS

Rešetová, Kvetoslava - Václavová, Alena: The value of publishing space. (http://www.ikaros.cz)
In: Ikaros [online]. - ISSN 1212-5075. - Vol. 18, No. 8 (2014), online, [4] p.

Rešetová, Kvetoslava: Quality development of publication output in processes of faculty evaluation. (http://article.sciencepublishinggroup.com/pdf/10.11648.j.sjedu.20140202.13.pdf)
In: Science Journal of Education [elektronický zdroj]. - ISSN 2329-0900(P). - ISSN 2329-0897(E). - Vol. 2, No. 2 (2014), online, pp. 50-57.

Rešetová, Kvetoslava: Partner agreements of STU MTF with economic practice.
In: Transfer. - ISSN 1337-9747. - Vol. 6, No. 2 (2014), pp. 8-9

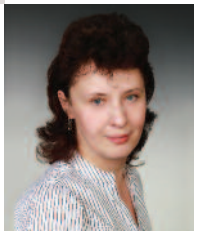
Rešetová, Kvetoslava: Cooperation with practice at STU MTF in the year 2013. - ITMS 26110230113.
In: Transfer. - ISSN 1337-9747. - Vol. 6, No. 1 (2014), pp. 20-22

Rešetová, Kvetoslava: The use of an Academic Library for Intellectual Capital Development in the Academic Environment. In: ECIC 2014: proceedings of the 6th European Conference on Intellectual Capital. 10 - 11 April 2014, Trnava, Slovak Republic. - : Academic Conferences and Publishing International Limited, 2014. - ISBN 978-1-909507-20-3. - S. 161-167

Rešetová, Kvetoslava: STU MTF presentation in MSV.
In: Strojárstvo - Strojírenství. - ISSN 1335-2938. - Vol. 18, No. 11 (2014), pp. 64

This part of Annual Report 2014 was verified by PhDr. Kvetoslava Rešetová, PhD.

DIVISION OF ECONOMIC ACTIVITIES



CONTACT

Head of the Division
Ing. Svetlana Mihoková
e-mail: svetlana.mihokova@stuba.sk
tel.: +421918646016

Address Paulínska 16, 917 24 Trnava, Slovak Republic
tel.: +421906068200

STAFF

11

PRIORITIES OF THE DIVISION

Division of Economic Activities is the economic and administrative unit of the Faculty, which provides the economic, operative, administrative, and other services related to the Faculty performance, such as the complex specialised financial, accounting, budgetary and fiscal activities necessary for the proper economic functioning of the Faculty in accordance with applicable legislation in the field of business entrepreneurial activities as well as the student hostels and canteen.

The Division:
- Runs Magion the economic information system in modules such as liabilities, receivables, banks, treasury, stocks, travel orders, purchase orders , contracts, budgets and plans;
- Caries out financial control procedures for all financial transactions;
- Bears responsibility for the economical and efficient use of public resources and extra subsidies for the educational, research and investment activities as well as the activities of the Faculty hostel and canteen;
- Monitors the implementation of the current and capital expenditures for individual programmes and is responsible for observing the budgetary discipline;
- Provides the economic data necessary for the Dean and Vice-Deans' managerial activities;
- Methodically manages other divisions and departments of the Faculty and cooperates in dealing with economic problems of the Faculty;
- Develops inventories and accounts closings in accordance with the applicable legislation;
- Prepares the Annual Report on the Faculty economy and statistical and economic analyses;
- Co-operates in clearing the financial reports of research projects;
- Provides consultancy and carries out clearing of the Structural Funds projects;
- Participates in establishing the Faculty internal regulations and directives;
- Archives all the tax and accounting documents.

ACTIVITIES OF THE DIVISION IN 2014

- Preparing reports on drawing funds for various purposes;
- Preparing legislative documentation for the economic performance of the Faculty;
- Preparing financial settlement of conferences and the entrepreneurial activity projects.

This part of Annual Report 2014 was verified by Ing. Svetlana Mihoková

DIVISION OF ESTATE ACTIVITIES

CONTACT

Head of the Division
Mgr. Elena Janíčková
e-mail: elena.nemetzova@stuba.sk
tel.: +421917865242

Address: Paulínska 16, 917 24 Trnava,
Slovak Republic
tel.: +421906068200

STAFF

45

PRIORITIES OF THE DIVISION

1. The Division of Estate Activities is a technical-administration unit of the Faculty, which provides operative, administrative, and other services related to the proper Faculty and division operation.
2. The Division of Economic and Estate Activities is responsible predominately for the logistic and controlling functions of the Faculty, maintenance of the registry system of the Slovak University of Technology at the Faculty.

ACTIVITIES OF THE DIVISION IN 2014

- repair and maintenance of the engine room at the swimming pool
- repair of heat exchanger in "Z" pavilion
- repair of substation in the Heavy Laboratories

This part of Annual Report 2014 was verified by Mgr. Elena Janíčková

DIVISION OF PERSONNEL AND ADMINISTRATION

CONTACT

Head of the Division Ing. Jaroslava Ďurišová
e-mail: jaroslava.durisova@stuba.sk
tel.: +421918646017

Address Paulínska 16, 917 24 Trnava, Slovak Republic
tel.: +421906068120

SECTIONS

- Dean's Secretariat
- Personnel Section
- Section of Employment and Economic Development
- Payroll Section (Wages and Salaries)
- Section of Safety & Health Protection at Work, Civilian Protection and Fire Safety
- Section of Security Systems

STAFF

10

PRIORITIES OF THE DIVISION

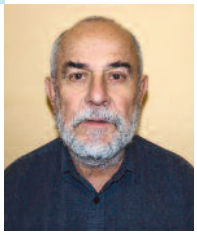
1. The Division of Personnel and Administration is the administration-service unit of the Faculty. It is responsible for securing all the administrative and service activities connected with the hiring and rewarding of the Faculty employees, social and health insurance of employees, recording and processing of income issues, activities of the Dean's secretary office and the security systems of the Faculty.
2. The Division of Personnel and Administration 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 Administration 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 IN 2014

- Charity event: Christmas Bazaar
- Management of the attendance system ESED
- Co-organisation of the Faculty events

This part of Annual Report 2014 was verified by Ing. Jaroslava Ďurišová

DEPARTMENT OF HUMANITIES AND SOCIAL SCIENCES



CONTACT

Head of the Department
Ing. Milan Petráš, PhD.
e-mail: milan.petras@stuba.sk
tel.: +421917500924

Address: Paulínska 16, 917 24 Trnava,
Slovak Republic
tel.: +421918646071

SECTIONS

- Humanities
- Professional Language Communication
- Physical Education and Sport

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

STAFF

17

PRIORITIES OF THE DEPARTMENT

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.

ACTIVITIES OF THE DEPARTMENT IN 2014

Date	Title of event or activity at the Department in 2014
8-9 March	40th year of Grand Prix Trnava - International swimming competition
22 April	Swimming competition for MTF students
23 April	Volleyball tournament for MTF employees
9 December	Football tournament for MTF students
10 December	Table tennis tournament for MTF students
10 December	Swimming competition for MTF students
11 December	Volleyball tournament for MTF employees and students

Within the ***Development of pedagogical competences of STU MTF doctoral students*** project the following was organised:
- preparation and publishing of textbooks and exercise books for the course (Jan-Mar 2014)
- organisation and delivery of the 6 modular courses (March 2014)
- organisation of Conference *International Conference on Development and Implementation of Academic Competencies of PhD. students of Technical Sciences* (24 April)
- publishing of Conference proceedings (May 2014)

October-November **UNIcert®** II and III course

Dies Iovis Occurssus – Thursday meetings once a month, providing space for sharing interesting information presented by experts in the scientific, cultural and social fields.

BACH (Rich and Poor) – the project oriented on the enhancement of students´ financial literacy (in cooperation with PartnersGroup and Pioneer Investments.

PROJECTS OF THE DEPARTMENT IN 2014:

VEGA 1/0226/12 Correspondence of Ján Kvačala 1860-1934
Research period: 2012-2014. Principle investigator: L. Bernát. The project deals with the unknown correspondence of Ján Kvačala, a renowned comeniologist (1862-1934).

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 engineering university students, as well as the framework for their evaluation are in compliance with the European Qualifications Framework and the National Qualifications Framework.

ESF: Development of pedagogical competences of the STU MTF doctoral students (ITMS project code 26110230023). Research period: 05/2010 – 6/2014. Investigators: K. Kováč, P. Halada.
The strategic aim of the project is the development of the human potential in the research and innovation via postgraduate study and specialised preparation of researchers while networking the activities of universities, research centres and enterprises. The project goal is to develop pedagogical competences and support academic development of PhD students. Fundamental activities are the complete pedagogical and psychological training of the STU MTF PhD students for their pedagogical activities in tertiary education institutions. Another objective is the preparation and implementation of the modular course "Teacher training in the university pedagogy for STU MTF PhD students ". The development of pedagogical competencies is connected with the preparation and implementation of the "Capstone modular course".

ESF: Implementation of an internal system of education quality assurance (ITMS project code 26110230042).The aim of the project is to design and verify the system of objective quality assessment and effective and purposeful education in order to achieve continual adaptation of tertiary education institutions to current and future needs of knowledge society. It will enable the introduction of the system of direct quality measurement of tertiary education, while improving the outputs and approximating the educational system to the society needs. The project objectives are:
- to design and verify the system of objective quality assessment of education in the bachelor study programmes in STU MTF;
- 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 study programmes in STU MTF;

to design and verify the evaluation of measures in the bachelor study programmes in STU MTF.
Research period: 01/2012 – 06/2014

SUBJECTS GUARANTEED BY THE DEPARTMENT IN 2014:

Bachelor Thesis
History of Technology and Vocational Schooling
European Integration Processes
English Language I, II, III, IV
English Language for PhD students
Industrial Sociology
Prognostics
Psychology of the Work of a Manager
Social Ecology
Social Communication
Social Policy
Sociology of Education
Sociology of Work
Sociology of Management
Physical Education I,II
Pedagogy II - Andragogy
Introduction into Scientific Work
Introduction into University Study
Entrepreneurial Education
Selected Chapters of Work Psychology
Fundamentals of Ethics
Fundamentals of Communication
Fundamentals of Law for Engineers and Managers I,II
Mental Hygiene
Industrial Psychology
Managerial Psychology

MEMBERSHIP OF PROFESSONAL ORGANISATIONS

CASAJC
(Czech and Slovak Association of Language Teachers at Universities)
Gabriela Chmelíková
Emília Mironovová
Róbert Soták
Ľudmila Hurajová

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

Slovak Swimming Federation
Rastislav Hlavatý

Slovak Tennis Association
Elena Lukačovičová

Slovak Historical Society
Libor Bernát

Slovak Pedagogic Society
Libor Bernát

PUBLICATIONS (THE MOST IMPORTANT PUBLICATIONS IN 2014)

University textbooks published by the domestic publishers

Cagáňová, Dagmar - Chmelíková, Gabriela - Bernát, Libor: Rhetoric: A follow-up modular course. - Trnava: Totem s.r.o., 2014. - 55 p. - ISBN 978-80-971360-4-8

Rajský, Andrej - Bednáriková, Mária - Chmelíková, Gabriela - Soták, Róbert: Writing a comprehensible text: A follow-up modular course. - Trnava: Totem s.r.o., 2014. - 57 p. - ISBN 978-80-971360-6-2

Vidová, Helena - Kováč, Karol - Sawicki, Silvester - Novotná, Ivana - Ručková, Gabriela: Managing stressful and conflict situations: A follow-up modular course. - Trnava: Totem s.r.o., 2014. - 60 p. - ISBN 978-80-971360-2-4

Workbooks

Šramel, Bystrík: Law in engineering education: A follow-up modular course. Trnava: Totem s.r.o., 2014. 71 p. ISBN 978-80-971360-8-6. Project: 26110230023 325.

Rajský, Andrej - Bednáriková, Mária - Chmelíková, Gabriela - Soták, Róbert: Writing a comprehensible text: workbook. [electronic document] CD-ROM. Trnava Totem, s.r.o. 64 p. ISBN 978-80-971360-7-9. Project: 26110230023 294.

Kováč, Karol - Sawicki, Silvester - Novotná, Ivana - Ručková, Gabriela. Managing stressful and conflict situations. Workbook [electronic document] CD-ROM. Trnava Totem, s.r.o 2014. 60 p. ISBN 978-80-971360-3-1. Project: 26110230023 294.

Bernát, Libor - Chmelíková, Gabriela - Soták, Róbert. Rhetoric. Workbook. [electronic document] CD-ROM. Trnava Totem, s.r.o. 2014. 60 p. ISBN 978-80-971360-5-5. Project: 26110230023 294.

This part of Annual Report 2014 was verified by Mgr. Gabriela Chmelíková, PhD.

ABBREVIATED ABSTRACT IN SLOVAK LANGUAGE
SKRÁTENÝ ABSTRAKT V SLOVENSKOM JAZYKU

Annual Report 2014 – Prostredie vzdelávania na fakulte

PREDSLOV

Rok 2014 bol na fakulte rokom zmien. V tomto roku ukončil svoje funkčné obdobie Dr.h.c. prof. Dr. Ing. Oliver Moravčík vo funkcii dekana. Bolo to obdobie najturbulentnejších zmien vo vývoji fakulty, ktoré priniesli výrazné úspechy. Či už to bolo v umiestnení fakulty v rantingových a rankingových hodnoteniach (najvýznamnejšie zlepšenie medzi technickými fakultami na Slovensku), alebo v získavaní mimorozpočtových prostriedkov z európskych štrukturálnych fondov (v plánovacom období 2007-2014 sme získali celkovo 90 miliónov eur). Najvýznamnejším míľnikom pre rozvoj fakulty bol začiatok budovania Univerzitného vedeckého parku. Mimoriadna vážnosť bola venovaná odovzdaniu akreditačného spisu, ktorého výsledky budú známe v roku 2015. Za všetko úsilie v prospech fakulty by som chcel poďakovať bývalému dekanovi fakulty a všetkým, ktorí sa podieľali na týchto úspechoch.
Aké priority bude mať nové vedenie fakulty?

- V prvom rade je to úspešné dobudovanie komplexu univerzitného vedeckého parku CAMBO
- Preferovanie budovania prístrojovej a ľudskej vedeckovýskumnej základne v rámci štrukturálnych fondov a najmä etablovanie sa v projektoch HORIZON 2020 ako akceptovateľného partnera pre európsky a svetový výskumný a vzdelávací priestor
- Udržať A- hodnotenia fakulty v procesoch komplexnej akreditácie a je postavenia v rámci STU
- Podporovať spoluprácu s praxou trvalo udržateľnými vzťahmi
- Výrazne zvýšiť záujem o štúdium na fakulte

Moje motto do nového obdobia ostáva nezmenené tak, ako som ho deklaroval pri voľbe dekana:
Šíriť dobré meno fakulty kvalitnou poctivou prácou.

prof. Dr. Ing. Jozef Peterka
dekan fakulty

VEDENIE FAKULTY

Zloženie akademických funkcionárov. V roku 2014 prišlo k zmene na základe volieb dekana dňa 28. 05. 2014 v súlade s Vykonávacími predpismi pre voľby kandidáta na dekana MTF STU a Harmonogramom volieb kandidáta na dekana MTF STU. Za dekana MTF STU bol zvolený prof. Dr. Ing. Jozef Peterka.

ÚSTAVY FAKULTY, PRACOVISKÁ FAKULTY

- Ústav materiálov
- Ústav výrobných technológií
- Ústav výrobných systémov a aplikovanej mechaniky
- Ústav priemyselného inžinierstva a manažmentu
- Ústav bezpečnosti, environmentu a kvality
- Ústav aplikovanej informatiky, automatizácie a matematiky
- Ústav výskumu progresívnych technológií
- Odbor komunikačných a informačných systémov
- Odbor akademických činností
- Odbor poznatkového manažmentu
- Odbor ekonomických činností
- Odbor prevádzkových činností
- Personálny odbor
- Lektorský kabinet

VEDECKÁ RADA, AKADEMICKÝ SENÁT

Zloženie Vedeckej rady a Akademického senátu, ktorý je aktualizovaný na stránkach http://www.mtf.stuba.sk/sk/historia-fakulty/uradna-tabula.html?page_id=427

ROZVOJ

Priority rozvoja v roku 2014, Zahájenie 2.etapy budovania Univerzitného vedeckého parku, Kľúčové aktivity v roku 2014 v oblasti rozvoja fakulty, Spolupráca s praxou, Noví partneri z praxe , Zmluvy s spolupráci v roku 2014, Ocenenia v kategóriách patentov a spolupráce s praxou v roku 2014, Prezentácie firiem na MTF v roku 2014, Projekty zo štrukturálnych fondov EÚ riešené v roku 2014

VZDELÁVANIE

Akreditované študijné programy, Systém štúdia, Štatistické ukazovatele za rok 2014 v oblasti vzdelávania, Kvalita vzdelávania, Ocenenia študentov

VÝSKUM A ZAHRANIČNÉ VZŤAHY

Ocenenia v oblasti výskumu za rok 2014, Prehľad udalostí v oblasti výskumu, Noví Doctor honoris causa, noví profesori a docenti na MTF v roku 2014, Výskumné aktivity, Konferencie v roku 2014, Výskumná charakteristika a zameranie, Zahraničné vzťahy, Návštevy zahraničných hostí na MTF v roku 2014, Členstvo MTF v medzinárodných organizáciách

VNÚTORENÉ VZŤAHY

Ocenenia v roku 2014, Výber mesačných udalostí, Aktivity Public relations v roku 2014, Vydavateľská činnosť v roku 2014, Sociálny program, Zamestnanecká rada, Bezpečnostný systém, Alumni a aktivity v roku 2014

ŠTRUKTÚRA INFORMÁCIÍ O PRACOVISKÁCH

Kontakt, Stav zamestnancov, Počty študentov a absolventov na ústavoch, Študijné programy garantované ústavom, Aktivity ústavu v roku 2014, Profil absolventa ústavu, Zoznam predmetov garantovaných ústavom, Záverečné práce na ústave, Oblasť výskumu ústavu a jeho výskumná charakteristika, Oblasti expertíz ponúkaných ústavom, projekty riešené v roku 2014 na ústave, Zahraničné pracovné cesty členov ústavu v roku 2014, Členstvo v domácich a zahraničných organizáciách, Výber publikačnej činnosti za rok 2014.

TABLE OF CONTENTS

This publications was written as a part of the project Human Resources Development in the field of research and development for the UVP-CAMBO, ITMS 26110230116. The Project is elaborated within the Operational Programme of Education, and financed from the European Social Fund.

Modern Education for Knowledge Society/ Project co-financed from the EU funds.

The publication was approved by the Faculty management within the STU MTF publication scheme on 3 December 2013.

Editor: PhDr. Kvetoslava Rešetová, PhD.

Táto publikácia je výstupom projektu Rozvoj ľudských zdrojov v oblasti výskumu a vývoja pre Pracovisko materiálového výskumu UVP CAMBO, ITMS 26110230116. Projekt je realizovaný na základe podpory operačného programu Vzdelávanie, financovaný z európskeho sociálneho fondu.

Moderné vzdelávanie pre vedomostnú spoločnosť / Projekt je spolufinancovaný zo zdrojov EÚ.

Publikácia bola schválená Vedením fakulty v edičnom pláne MTF STU dňa 3.12.2013.

Zostavovateľ: PhDr. Kvetoslava Rešetová, PhD.

Title: Annual Report 2014 - Faculty Educational Environment
Editor: PhDr. Kvetoslava Rešetová, PhD
Translation: PhDr. Emília Mironovová
Preview: Paul Woolliscroft - U.K.

Pages: 100; quires: 10,5 (210 standard pages)
Number of copies: 1500 pcs.
1st Edition, 2015

ISBN 978-80-8096-212-8
EAN 9788080962128

Názov: Annual Report 2014 – Prostredie vzdelávania na fakulte
Zostavovateľ: PhDr. Kvetoslava Rešetová, PhD.
Preklad: PhDr. Emília Mironovová
Jazyková korektúra prekladu: Paul Woolliscroft - U.K.

Počet strán: 100; 10,5 AH (210 normostrán)
Náklad: 1500 ks
1.vydanie, 2015

ISBN 978-80-8096-212-8
EAN 9788080962128

ISBN 978-80-8096-212-8

www.mtf.stuba.sk