

LABORATORY OF INDUSTRIAL ENGINEERING

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Head of Laboratory

Prof. Michal Girman

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1. LABORATORY'S PROFILE

The mission of the Laboratory is teaching and research in the area of effective production planning and control, modern technologies in manufacturing (IT & Automation), and the human factor in manufacturing. The Laboratory introduces a new branch of study - Industrial Engineering. This profession will adopt as its continuous improvement of products and services throughout their life cycles. The humanities and social sciences, computer sciences, basic sciences, management sciences, highly developed communication skills along with physical, behavioural, mathematical, statistical, organisational, and ethical concepts are used to achieve these aims.

2. STAFF

Associate Professors:	Michal Girman, Kristína Zgodavová
Assistant Professors:	Peter Bober, Marcela Halušková, Peter Košč
Senior Scientists:	Juraj Haluška
Technical Staff:	Gabriela Brečková
PhD. Students:	Peter Keusch

3. EQUIPMENT

3.1. Teaching and Research Laboratories

- Laboratory of Industrial Systems is designed for courses as Industrial Systems, Automation of Technological Processes, and Industrial Electronics.
- Laboratory of Information Technologies is designed for courses as Information Systems in Industry, and Simulation of Manufacturing Systems.

3.2. Special Measuring Instruments and Computers

The Laboratory of Industrial Systems is equipped with:

- Pneumatic and hydraulic systems FESTO DIDACTIC (compressor, linear pneumatic motors, electropneumatic valves, linear pneumatic NC axis, hydraulic generator, linear hydraulic motor, electrohydraulic valve).
- Modular Production System from FESTO DIDACTIC (full functional distribution, testing, and processing stations controlled by PLC).
- AC drive with LENZE converter, DC drives with ALLEN BRADLEY converters.
- Programmable controllers: SIEMENS (SIMATIC S7-400 with SIMATIC NET CP for Industrial Ethernet, SIMATIC S7-300 with PID Control Module and SIVAREX Weight Module, and two SIMATIC ET200M), ALLEN BRADLEY (two controllers from SLC500 family), TELEMECANIQUE (TSX 07)
- Timers and Semiconductor Contactor from CARLO GAVAZZI
- Physical model of continuous line with five DC disk drives
- plotters for educational purposes controlled by PC
- PCs

The Laboratory of Information Technologies is equipped with:

- 12 PCs
- three servers (Lynux, Windows Server, IBM RS 6000 AIX).
- Multimedia Projector
- J Builder for Java programming
- SIMPLE++ simulation software
- ARIS tool for business process reengineering
- Matlab
- Macromedia Director

4. **TEACHING**

4.1. Graduate Study (Ing.)

Subject	Semester	Hours per week lectures/seminars or practical exercises	Lecturer
Microprocessor Technique	3 rd	2/3	Girman
Industrial Electronics	5 th	2/3	Haluška
Industrial Systems	5 th	2/3	Bober
Operation Research	5 th	2/3	Košč
Marketing	5 th	2/1	Halušková

Automation of Technological Processes	6 th	2/3	Girman
Information Systems in Industry	6 th	2/3	Košč
Real-time Programming	6 th	2/3	Bober
Quality Control	7 th	2/2	Zgodavová
Project Management	7 th	2/2	Halušková
Logistics	7 th	2/2	Girman
Simulation of Manufacturing Systems	8 th	2/3	Bober
Design of Manufacturing Systems	8 th	3/3	Halušková
Design of Quality Management Systems	8 th	2/3	Zgodavová

4.2. Undergraduate and Graduate Study for Foreign Students (in English Language)

Subject	Semester	Hours per week lectures/seminars or practical exercises	Lecturer
Marketing	5 th	2/1	Halušková
Information Systems in Industry	6 th	2/3	Košč
Quality Control	7 th	2/2	Zgodavová
Project Management	7 th	2/2	Halušková
Simulation of Manufacturing Systems	8 th	2/3	Bober
Design of Manufacturing Systems	8 th	3/3	Halušková
Design of Quality Management Systems	8 th	2/3	Zgodavová

5. RESEARCH PROJECTS

Title: **WELLDONE - „Web Learning Support Environment for Disabled People”**

Funding: SOCRATES N° 56193-CP-1-98-1-SK-ODL-ODL

Partners: University of Žilina (SK), Boarding School for Disabled People, Košice (SK), Didactic Center, Prešov (SK), University of Utrecht (NL), Vienna University of Technology (A), University of Salerno (I), University of Patras (GR).

Duration: 1998 - 2000

Co-ordinator: Peter Košč

Activity: Experimental pilot project aimed at the development, implementation, and evaluation of the Web-based Learning.

Title: **Research of Theoretical And Practical Problems of Quality Management of Onset New Production**

Funding: Ministry of Education Agency VEGA Ref. no 1/7111/20
Duration: 2000-2002
Co-ordinator: Kristína Zgodavová
Activity: Creation of relatively complete theory and methodology of quality management for launching of new production. It includes identification and analysis of failures generation and dissemination, investigation of the assumptions regarding further evolution of the production.

6. COOPERATION

6.1. Cooperation in Slovakia

University of Žilina
Slovak University of Technology, Bratislava
University of Pavol Jozef Šafárik, Košice
Boarding School for Disabled People, Košice
Didactic Center, Prešov
Industrial Property Office of the Slovak Republic, Banská Bystrica
Regional Advisory and Information Centre, Košice
SWH Siemens Business Service Ltd., Bratislava
VSŽ Oceľ Ltd., Košice
Kopex Ltd., Košice.
Whirlpool Slovakia Ltd., Poprad
Embraco Slovakia Ltd., Spišská Nová Ves
Slovtransgaz Slovakia, Veľké Kapušany

6.1.1. Visitors to the Department

Dr. Frank Buskermolen	25.2.-28.2.2000 2.7.-7.7.2000	University of Utrecht (NL)
Dr. Francesca Cirillo	25.2.-28.2.2000 1.7.-7.7.2000	University of Salerno (I)
Prof. Dieter Buchberger	26.9.-2.10.2000	Fachhochschule Ulm (D)
Dr. Yvonne de Jong	2.7.-7.7.2000	University of Utrecht (NL)
Prof. Bernd Lange	22.2.-28.2.2000	Fachhochschule Ulm (D)
Prof. Gunther Hentschel	22.2.-28.2.2000	Fachhochschule Ulm (D)

Prof. Peter Konold	22.2.-28.2.2000 30.6.-3.7.2000 26.9.-2.10.2000	Fachhochschule Ulm (D)
Prof. Massimo de Santo	25.2.-28.2.2000 1.7.-7.7.2000	University of Salerno (I)

6.2. International Cooperation

VSB-Technical University of Ostrava (CZ),
 University of Vaasa (FI),
 Växjö University (SE)
 Hongkong Baptist University (China),
 University of Utrecht (NL)
 University of Salerno (I)
 University of Calabria (I)
 Fachhochschule Ulm (D)
 University of Patras (GR)
 Vienna University of Technology (A)
 The Nottingham Trent University (UK),

6.2.1. Visits of Staff Members to Foreign Institutions

Bober	22.7.-29.7.2000	University of Utrecht (NL)
	17.9.-25.9.2000	Fachhochschule Ulm (D)
Brečková	22.7.-29.7.2000	University of Utrecht (NL)
Bujaloboková	12.6.-21.6.2000	University of Salerno (I)
Girman	6.3.-10.3.2000	Fachhochschule Ulm (D)
	1.6.-8.6.2000	
	21.7.-28.7.2000	
	21.8.-28.8.2000	
	17.9.-23.9.2000	
Haluška	8.6.-25.6.2000	Universita of Salerno (I)
	26.6.-7.7.2000	Fachhochschule Ulm (D)
Halušková	8.6.-25.6.2000	University of Salerno (I)
	26.6.-7.7.2000	Fachhochschule Ulm (D)
Keusch	12.6.21.6.2000	University of Salerno (I)
	17.9.-23.9.2000	Fachhochschule Ulm (D)
Košč	31.3.-13.4.2000	Fachhochschule Ulm (D)
	10.6.-23.6.2000	University of Salerno (I)
	15.7.-19.7.2000	Fachhochschule Ulm (D)

	21.7.-25.7.2000	
	26.7.-30.7.2000	University of Utrecht (NL)
	6.8.-10.8.2000	
	12.8.-16.8.2000	Fachhochschule Ulm (D)
	17.9.-21.9.2000	
	22.9.-26.9.2000	University of Utrecht (NL)
Zgodavová	26.3.-4.4.2000	Oxford University (GB) Eindhoven University (NL)
	22.5.-29.5.2000	University of Vaasa (FI)
	17.7.-23.7.2000	University of Utrecht (NL)
	25.7.-31.7.2000	Fachhochschule Ulm (D)
	23.8.-29.8.2000	University of Utrecht (NL)
	17.9.-25.9.2000	Fachhochschule Ulm (D)
	27.10.-31.10.2000	University of Utrecht (NL)

6.3. Membership in International Organizations and Societies

Czech Organisation for Quality Personnel Accreditation DTO Ostrava (Zgodavová)

6.4. Membership in Slovak Organizations and Societies

Slovak Union for Quality, Innovation and Design Q-IMPULZ (Zgodavová)

6.5. Contracts, International Scientific Projects

Title: **Measurement of Fluid Flows by means of Orifice Plates, Nozzles and Venturi Tubes Inserted Cross-section conduits Funning Full (according ISO 5167-1)**

Contract for Slovtraspaz Slovakia, Velké Kapušany (SK).

Title: **Extension - „Education in Industrial Standards for Information Technologies - Introduction of New Degree Courses”**

Funding: PHARE TEMPUS S_JEP 12337-97

Partners: University of Žilina (SK), Fachhochschule Ulm (D), University of Patras (GR), University of Calabria (I), The Nottingham Trent University (UK), University of Salerno (I), Institute of Lifelong Learning TU Košice (SK), Kopex Ltd., Košice (SK).

Duration: 1997 - 2000

Co-ordinator: Otakar Bokůvka (University of Žilina)

Contractor: Michal Girman

Activity: 1) Development of a new course in Industrial Standards.
2) Development and implementation of internal and external quality

assessment of higher education institutions - implementation of ECTS in Slovak Republic.

Title: **STAMP - European Standards for Advanced Manufacturing Technologies and Intellectual Property**

Funding: TEMPUS, IB_JEP-14092-1999

Partners: Slovak University of Technology (SK), University of Pavol Jozef Šafárik (SK), Regional Advisory and Information Centre Košice (SK), Siemens SWH, Ltd. (SK), Fachhochschule Ulm (D), University of Utrecht (NL).

Duration: 1999-2001

Co-ordinator: Peter Košč

Contractor: Peter Košč

Activity: Training of Slovak civil servants and professionals in EU standards for advanced manufacturing technologies and intellectual property.

Title: **SOCRATES Programme: Higher education (ERASMUS)**

Funding: SOCRATES

Partner: Fachhochschule Ulm (D)

Duration: 1999 - 2000

Contact: Marcela Halušková

Activity: Cooperation within the SOCRATES Programme - students and teachers exchange.

Title: **SOCRATES Programme: Higher education (ERASMUS)**

Funding: SOCRATES

Partner: University of Vaasa (Fi)

Duration: 1999 - 2000

Contact: Kristína Zgodavová

Activity: Cooperation within the SOCRATES Programme - students exchange programme.

Title: **Catalogue of products of VSŽ Oceľ**

Funding: VSŽ Oceľ s.r.o., Košice, V96

Partners: VSŽ Oceľ s.r.o., Košice (SK), Kopex s.r.o., Košice (SK).

Duration: 1999 - 2001

Co-ordinator: Ján Čepko (VSŽ Oceľ)

Activity: 1) Inovation and continuous data updating for Catalogue of products of VSŽ Oceľ.

2) Preparation of materials for updating Intranet, Internet, CD-Rom, and printed Catalogue.

2) Establishing of system for database updating of stanfards VTP SO 18/PV.

Results: CD-Rom Catalogue.

Title: **Amendment of the AMETMAS-NoE**

Funding: INCO-COPERNICUS CP96-0026

Partner: University of Patras (GR)

Duration: 1996 - 2000

Co-ordinator: Peter Groumpos (GR)

Contact person: Marcela Halušková

Activity: Extension of the Network of Excellence on Advanced Methodologies and Tools of Manufacturing Systems (AMETMAS) and addition of nodes from Central and Eastern Europe.

7. **THESIS**

7.1. Masters Theses

- [1] Pekár, J.: Using Multimedia in Industrial Engineering (Halušková, M.)
- [2] Kollár, F.: Application of Theory of Constraints to Project Management (Halušková, M.)
- [3] Harmaňoš, T.: Information System of Accident Surgery Clinic (Halušková, M.)
- [4] Šváb, T.: Control of Customer Production with Method of TOC (Halušková, M.)

7.2. Doctoral Theses

- [1] Keusch, P.: Optimisation of Fuzzy Controller by Evolutionary Algorithms (Girman, M.)
- [2] Commerell, W.: Hardware in the Loop Simulation of Electromobile (Girman, M.)
- [3] Grendel, P.: Method Development of Tolerance Assurance for Automotive Components (Zgodavová, K.)
- [4] Pitorak, M.: Strategic Management of TQM Implementation in US Steel (Zgodavová, K.)

8. **OTHER ACTIVITIES**

Editorial board for Journal „Kvalita Inovácia Prosperita” (Quality Innovation Prosperity), ISSN 1335-1745

Courses for small and medium enterprises (in Slovak):

- Quality Professional - ISO 9000:2000
- Quality Professional - EFQM model of performance excellence
- Quality Professional - Software Quality Engineering

- European Standards in Automation

TEMPUS Project „STAMP” Workshop, 2.7.-7.7 2000, Štrbské Pleso, Slovakia

Summer School, Project Socrates „WELLDONE”, Štrbské Pleso, Slovakia, 2.7.-7.7.2000

Lectures for PhD. students given by Zgodavová (in English):

- Theory of Quality.
- Tools and Methods of Quality improvement.

Lecture given by Zgodavová at University of Vaasa, Finland:

- TQM Role Play Simulation

9. PUBLICATIONS

9.1. Books

[1] BOBER, P.: Real-time Programming. Žilina: Jozef Blaha, 2000, 124 pages (in Slovak)

9.2. Journals

[1] ZGODAVOVÁ, K.: Design of Quality Systems through Simulation. In: „Kvalita” – No.3 (2000), pp.10-15. (in Slovak)

9.3. Textbooks

[1] ZGODAVOVÁ, K.: Total Quality Management for Secondary School Teachers. University of Technology in Košice, 2000, 103 pages (in Slovak)

9.4. Conferences

- [1] ZGODAVOVÁ, K., KOŠČ, P., TAUNO, K.: Quality Management Cooperation Roleplay Based on Virtual Organisation. In: 1st International Conference on Cooperation & Competition [Edited by Zineldin, M.]: Växjö, Sweden, 8.-10.11.2000, pp.150-159 (in English, Best paper award in subtheme „The Making of New Economics & Technology”)
- [2] ZGODAVOVÁ, K.: SOS(Q) - Systematic Elimination of Weak Points in Quality. In: Proceedings of 5th ICIT TQM & ISO 9000, „Action 2000: Imperatives for Improvement [Edited by Ho, S]: Singapore, 25.-27.4.2000 (in English)
- [3] ZGODAVOVÁ, K., SLIMÁK, I.: Strategies of Quality of Small and Medium Enterprises in Transforming Economies. In: Proceedings 44th European Quality Congress, Volume 2 [Edited by Molnár, M. and Boross, F.]: Budapest, Hungary, 14.6.2000, pp.188-194 (in English)
- [4] Haluška, J., Štefan, B., Tarhaničová, R.: Interactive Catalogue of Sheets in STEEL Košice Ltd. In: Proceedings of Conference „Valcovanie plechov za tepla”: Vysoké Tatry - Stará Lesná, Slovakia, 9.-11.10.2000, pp.P11-1 – P11-5. (in Slovak)

