

## LABORATORY OF INDUSTRIAL ENGINEERING

<http://lpi.fe.i.tuke.sk>

Tel./Fax: ++421 55 602 2264

**Head of the Laboratory**

**doc.Ing. Michal Girman, PhD.**

E-mail: [Michal.Girman@tuke.sk](mailto:Michal.Girman@tuke.sk)



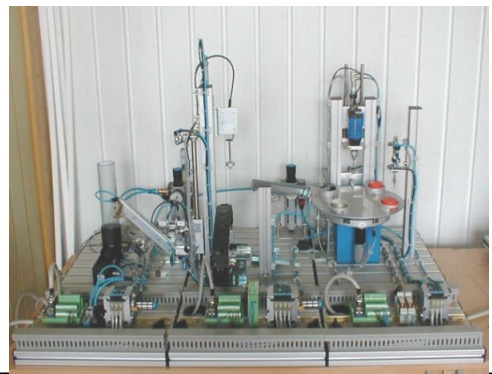
### **1 LABORATORY'S PROFILE**

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

### **2 STAFF**

**Associate Professors:** doc. Ing. Michal Girman, PhD.  
doc. Ing. Kristína Zgodavová, PhD.  
doc. Ing. Marcela Halušková, PhD.

**Assistant Professors:** Ing. Peter Bober, PhD.  
Ing. Peter Košč, PhD.



Ing. Peter Kmec, PhD.

**Senior Scientists:** Ing. Juraj Haluška, PhD.  
Ing. Peter Keusch

**Technical Staff:** Ing. Gabriela Brečková

**Ph.D. Student:** Ing. Ľubomír Lengyel

### **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 Production 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 valves).
  - Modular Production System from FESTO DIDACTIC (full functional distribution, testing, and processing stations controlled by PLC).
  - 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.
  - Plotters for educational purposes controlled by PC.
  - 10 personal computers
- The Laboratory of Information Technologies is equipped with:
  - personal computers
  - four servers
  - multimedia projectors
  - digital video camera, video grabber, scanner
  - Software:
    - ARIS tool for business process reengineering
    - Macromedia Director
    - J Builder for Java programming
    - Matlab
    - SIMPLE++ simulation software

## 4 TEACHING

### 4.1. Undergraduate Study (Bc.)

### 4.2. Graduate Study (Ing.)

Subject	Semester	Lectures/seminars or practical exercises (hours per week)	Name of lecturer
Industrial Electronics	5 <sup>th</sup>	2/3	Haluška
Industrial Systems	5 <sup>th</sup>	2/3	Bober

Subject	Semester	Lectures/seminars or practical exercises (hours per week)	Name of lecturer
Introduction to Industrial Engineering	5 <sup>th</sup>	2/3	Košč
Automation of Technological Processes I	6 <sup>th</sup>	2/3	Girman
Information Systems in Industry	6 <sup>th</sup>	2/3	Košč
Project Management	7 <sup>th</sup>	2/2	Kmec
Production Management and Logistics	7 <sup>th</sup>	2/2	Girman
Simulation of Production Systems	8 <sup>th</sup>	2/3	Bober
Quality Management	8 <sup>th</sup>	2/2	Zgodavová
Design of Manufacturing Systems	8 <sup>th</sup>	3/3	Halušková
Design of Quality Management Systems	9 <sup>th</sup>	2/3	Zgodavová
Automation of Technological Processes II	9 <sup>th</sup>	2/3	Girman

### 4.3. Undergraduate and Graduate Study for Foreign Students (In English Language)

Subject	Lectures/seminars or	Name of
---------	----------------------	---------

	<b>practical exercises</b> (hours per week)	<b>lecturer</b>
Quality Engineering	2/2	Zgodavová
Project Management	2/2	Halušková
Simulation of Production	2/3	Bober

## 5 RESEARCH PROJECTS

- *Parallel Simulation of Production systems, Institutional project of FEI TU Košice No. 4415, duration: 2000 - 2002, co-ordinator: Peter Bober, activity: Development of software tools for implementation of simulation in different area of production systems.*
- *Research of Theoretical And Practical Problems of Quality Management of Onset New Production, Slovak scientific grant agency VEGA project 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 CO-OPERATION

### 6.1. Co-operation in Slovakia

- University of Žilina
- Slovak University of Technology, Bratislava and Trnava
- Pavol Jozef Šafárik University in Košice
- Boarding School for Disabled People, Košice
- US Steel Ltd., Košice
- Kopex Ltd., Košice.
- Embraco Slovakia Ltd., Spišská Nová Ves
- Slovtransgaz Slovakia, Veľké Kapušany
- Slovak Union for Quality, Innovation and Design Q-IMPULZ, Košice

#### 6.1.1. Visitors to the Department

- Roman Bobák, PhD., Tomáš Baťa University in Zlín, Czech Republic
- Prof. Ljudmil Golemanov, PhD., University of Vaasa, Finland

- Päivi Haapalainen, University of Vaasa, Finland
- Gejza Horváth, PhD., University of West Bohemia in Pilsen, Czech Republic
- Prof. Josef Tošenovský, RNDr, PhD., VŠB – Technical University of Ostrava, Czech Republic
- Prof. Josu Takala, University of Vaasa, Finland

## **6.2. International Co-operation**

- VŠB-Technical University of Ostrava, Czech Republic
- West Bohemian University, Pilsen, Czech Republic
- University of Vaasa, Finland
- Växjö University, Sweden
- University of Salerno, Italy
- Fachhochschule Ulm, Germany
- Solviks Folk High School, Sweden
- Sundsgårdens Folk High School, Sweden
- Kristinehamns Folk High School KPS, Sweden
- Telecentres Powys, United Kingdom
- Learning Orbit Language, Austria

### **6.2.1. Visits of Staff Members to Foreign Institutions**

- Peter Bober: University of Vaasa, Finland, 16 - 24 April
- Peter Košč: Solviks Folkhogskola, Kage, Sweden, 15 - 17 March
- Kristína Zgodavová: University of Vaasa, Finland, 16 - 24 April, 23 September - 3 October; Technical University of Ostrava, Czech Republic, 28 - 30 May, 11 - 13 Jun, 20 - 21 November; School of Management and Economics, Växjö, Sweden 19 - 23 September; University of West Bohemia, Pilsen, Czech Republic, 3 - 4 October, 9 - 11 December

### **6.3. Membership in International Organizations and Societies**

- Kristína Zgodavová: Czech Organization for Quality Personnel Accreditation DTO Ostrava
- Kristína Zgodavová: Editorial Advisory Board for the C&C International Journal

### **6.4. Membership in Slovak Organizations and Societies**

- Kristína Zgodavová: Slovak Union for Quality, Innovation and Design Q-IMPULZ

## 6.5. Contracts, International Scientific Projects

- *Basics of Industrial Organization Management - Lifelong e-learning*, Contract for Embraco - Slovakia, Spišská Nová Ves, Slovakia.
- *Measurement of Fluid Flows by means of Orifice Plates, Nozzles and Venturi Tubes Inserted Cross-selection Conduits Funning Full (according ISO 5167-1)*, Contract for Slovtransgaz Slovakia, Velké Kapušany, Slovakia.
- *SOCRATES Program: Higher education (ERASMUS)*, SOCRATES project, partner: University of Applied Sciences, Ulm (Germany), duration: 2002 – 2003, contact: Michal Girman, activity: Co-operation within the SOCRATES Program - students and teachers exchange.
- *SOCRATES Program: Higher education (ERASMUS)*, SOCRATES project, partner: University of Vaasa (Finland), duration: 2002 – 2003, contact: Kristína Zgodavová, activity: Co-operation within the SOCRATES Program - students and teachers exchange program.
- *SOCRATES GRUNDTVIG: ACTIVE – „More Active Citizenship for Disabled by Distance Education“*, No 89903-CP-1-2001-1-SE-GRUNDTVIG-G1, duration: 2001 – 2003, contact: Peter Košč, activity: to support more active citizenship for persons with learning disabilities by means of special pedagogically adapted distance courses, web-learning environments, and learning centres. Retraining of teachers and development of special pedagogical ODL handbook.

## 7 THESES

### 7.1. Masters Theses

1. BUČKO, R. *The Study of Possibilities to Develop a Quality of Production in Vihorlat Snina* (Zgodavová, K.)
2. GAJDOŠ, R. *Complex Information System for LPR Michalovce* (Girman, M.)
3. GOŽO, P. *Complex Information System for LPR Michalovce* (Girman, M.)
4. HAMZA, P. *Electronic Tool for Self-assessment of Organisations According to EFQM Excellence Model* (Zgodavová, K.)
5. HINTOŠ, P. *Buffer Management in Project Management* (Halušková, M.)
6. HUDEC, I. *Modeling and Simulation of Mass Meals in Campus Canteen* (Bober, P.)
7. HUDEC, J. *Software Quality Assesment* (Bober, P.)

8. KEHL, P. *Translator from VHDL-AMS-RT to Matlab for Real-Time simulation* (Commerel, W.) (Girman, M.)
9. KŐRÖSI, G. *Process Identification* (Halušková, M.)
10. KUŠNÍR, D. *WWW Application for Role Play of Quality Management* (Bober, P.)
11. KUŠNÍRIK, R. *Software Tool for Audit of Quality Management System* (Zgodavová, K.)
12. LENGYEL, L. *Analysis and Design of Software for Business Process Modeling and Improvement* (Košč, P.)
13. LUKÁČ, M. *Software Support of Internet Benchmarking Centre* (Bober, P.)
14. MASTILÁK, D. *Multiple Project Management* (Halušková, M.)
15. PČOLA, L. *Distribution of Data Repositories from Management Information Systems* (Girman, M.)
16. PENCÁK, M. *Definition and Modeling of On-line Benchmarking Process* (Zgodavová, K.)
17. PIRHALA, M. *Expert System for Analysis of Departures in Management Information Systems* (Girman, M.)
18. RIDZOŇ, M. *Software for Procedural Solving of Production Planning with the Application of Evolutionary Algorithms* (Girman, M.)
19. ŠTRONGER, D. *Application of WAP Technologies in Control Systems* (Girman, M.)
20. TRUCHAN, M. *Design of Data Structures and Implementation of Software Modules for Computer Aided Role Play of the Quality Management System* (Zgodavová, K.)
21. URDA, M. *Multimedia Educational Software for Modeling and Improving Organisation Processes* (Košč, P.)
22. VINCE, G. *Design and Implementation of Computer Aided Role Play of the Quality Management in an Organization* (Bober, P.)
23. VRANSKÝ, J. *Process Identification* (Halušková, M.)
24. VRTAL, D. *Transformation of Model ISO 9001:1994 to ISO 9001:2000 and its Application in MB Industry Brezno* (Zgodavová, K.)

## **8 OTHER ACTIVITIES**

- Editorial board for Journal „Kvalita Inovácia Prosperita” (Quality Innovation Prosperity), ISSN 1335-1745, Members: Kristína Zgodavová, Michal Girman, Peter Bober, Peter Keusch, Ľubomír Lengyel
- Invited lectures abroad:
  - Kristína Zgodavová, Quality and Safety Management – Basic Course and



Advanced Course, University of Vaasa, Finland

- Peter Bober, Simulation of Production Systems, University of Vaasa, Finland
- STRAPING'02: Seminar Meeting for Industrial Engineers, 10 – 12 June, Herľany, Slovakia
- Planning Meeting of Project Grundtvig ACTIVE, 6 – 8 September, Štrbské Pleso, Slovakia
- Industrial Engineering Departments Meeting and 9<sup>th</sup> Quality Primacy Conference, 25 – 26 November 2002, Herľany, Slovakia

## 9 PUBLICATIONS

### 9.1. Books

1. ZGODAVOVÁ, K. – LINCZÉNYI, A. – NOVÁKOVÁ, R. – SLIMÁK, I.: *Profesionál kvality (Quality Professional)*. Košice: Technical University of Košice, 2002, 726 p., ISBN 80-7099-847-8.

### 9.2. Journals

1. BOBER, P.: *Niektoré poznatky z hodnotenia úrovne vyspelosti vybraných softvérových firiem podľa CMMI<sup>sm</sup> (Some Findings from Maturity Level Assessment of Software Organisations According CMMI<sup>sm</sup>)*. In *Kvalita Inovácia Prosperita (Quality Innovation Prosperity)*, 2002, vol. 6, no. 1, pp. 39-45.
2. KMEC, P.: *Management by Constraints*. In *Kvalita Inovácia Prosperita (Quality Innovation Prosperity)*, 2002, vol. 6, no. 1, pp. 46-51.
3. ZGODAVOVÁ, K.: *Faktory intenzívneho zlepšovania kvality výrobkov a služieb (Factors of Intensive Product and Service Quality Improvement)*. In *Ekonomický časopis (Journal of Economics) [Current Contents/Social and Behavioral Sciences]*, 2002, vol. 50, no. 6, pp. -.
4. ZGODAVOVÁ, K. – ZAIC, P.: *Príspevok k modelovaniu spôsobilosti produkčných procesov (A Contribution to Production Process Capability Modeling)*, In *Kvalita Inovácia Prosperita (Quality Innovation Prosperity)*, 2002, vol. 6, no. 2, pp. 17-26.

### 9.3. Slovak Conferences

1. Bober, P.: *Výsledky hodnotenia úrovne vyspelosti softvérových firiem podľa CMMI (Results of Software Firms Maturity Level Assessment According CMMI)*, In *2<sup>nd</sup> Industrial Engineering Departments Meeting and 9<sup>th</sup> Quality Primacy Conference*, Herľany, Slovakia, 25 – 26 November 2002, edited by Michal Girman and Kristína Zgodavová, [CD ROM], Košice: Technical University of Košice, 2002.
2. GIRMAN, M.: *Evolučné algoritmy v riadení výroby (Evolutionary Algorithms in Production Control)*, In *STRAPING´02: proceedings of the Industrial Engineers Meeting*, Herľany, Slovakia, 10 – 12 June 2002, LPI FEI TU Košice, 2002, pp. 16 – 21
3. GIRMAN, M.: *Prezentácia štúdiijného a výskumného programu pracoviska LPI (Presentation of Study Program and Research Field of the Laboratory of Industrial Engineering)*, In *2<sup>nd</sup> Industrial Engineering Departments Meeting and 9<sup>th</sup> Quality Primacy Conference*, Herľany, Slovakia, 25 – 26 November 2002, edited by Michal Girman and Kristína Zgodavová, [CD ROM], Košice: Technical University of Košice, 2002.
4. HALUŠKOVÁ, M.: *Strategický manažment – spôsob ako prežiť a prosperovať vo firmách (Strategic Management – Way How Organisations Can Survive and Prosper)*, In *STRAPING´02: proceedings of the Industrial Engineers Meeting*, Herľany, Slovakia, 10 – 12 June 2002, LPI FEI TU Košice, 2002, pp. 27 – 30.
5. KOŠČ, P.: *IEEE 1484 LTSA špecifikácia (IEEE 1484 LTSA Specification)*, In *STRAPING´02: proceedings of the Industrial Engineers Meeting*, Herľany, Slovakia, 10 – 12 June 2002, LPI FEI TU Košice, 2002, pp. 22 – 26.
6. KOŠČ, P.: *Decomposition of Quality Characteristics of Web Learning Environments*, In *2<sup>nd</sup> Industrial Engineering Departments Meeting and 9<sup>th</sup> Quality Primacy Conference*, Herľany, Slovakia, 25 – 26 November 2002, edited by Michal Girman and Kristína Zgodavová, [CD ROM], Košice: Technical University of Košice, 2002.
7. URBANČÍKOVÁ, N., KOŠČ, P., URBANČÍK, J.: *Využitie dištančného vzdelávania v ďalšom vzdelávaní inžinierov (Use of Distance Education in Lifelong Learning of Engineers)*, In *Nové trendy vo vzdelávaní*, Roháče, Slovakia, September 2002, Košice: Technical University of Košice
8. ZGODAVOVÁ, K. – URBANČÍKOVÁ, N.: *K niektorým otázkam identifikácie, hodnotenia a zlepšovania celoživotného vzdelávania (Questions about Identification, Assessment and Improvement of Lifelong Education)*, In *proceedings of the conference Multidimenzionálne aspekty kvality*, Banská Bystrica, Slovakia, 2002, Matej Bel University, Faculty of Economics, Banská

Bystrica, 2002, pp. 136 – 143.

9. Zgodavová, K.: *Predstava optima kvality (Notion of Quality Optimum)*, In *2<sup>nd</sup> Industrial Engineering Departments Meeting and 9<sup>th</sup> Quality Primacy Conference, Herľany, Slovakia, 25 – 26 November 2002*, edited by Michal Girman and Kristína Zgodavová, [CD ROM], Košice: Technical University of Košice, 2002.

#### 9.4. International Conferences

1. ZGODAVOVÁ, K. – KEKÄLE, T.: *New Product Launch Modelling in Alliances and Networks*. In *Co-operation&Competition „Co-opetition“ The Organisation of Future: proceesings of the 3<sup>rd</sup> International Conference C&C*, Växjö, Sweden, 19 – 21 September 2002, edited by Mosad Zineldin, Lund: Studenlittertaur, 2002, pp. 284 – 297.
2. ZGODAVOVÁ, K.: *K niektorým otázkam riadenia kvality nábehu novej produkcie (Some Questions about New Product Lunch Quality Control)*, In *Jakost 2002: proceedings of the 11<sup>th</sup> International Conference*, Ostrava, Czech Republic, 28 – 30 May 2002, Ostrava: Dům techniky, 2002, pp. H6 – H12.
3. ZGODAVOVÁ, K.: *K niektorým otázkam výskumu v rámci priemyselného inžinierstva (Some Questions about Research in the field of Industrial Engineering)*, In *Sborník příspěvků přednesených na pracovním setkání pracovníků kateder průmyslového inženýrství českých a slovenských vysokých škol*, Zlín, Czech Republic, 15 November 2001, Zlín: Tomas Bata University in Zlín, 2002, pp.1-1 – 1-6.