

**DEPARTMENT OF MECHANICS**

<http://www.elf.stuba.sk/departments/kmech/kmech.html>

**Head of Department**

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**I. STAFF**

|                      |   |
|----------------------|---|
| Professors           | Prof. Ing. Justín Murín, DrSc.  |
| Associate Professors | Doc. Ing. Branislav Hučko, PhD., Doc. Ing. Ján Veselovský, PhD.   |
| Assistant Professors | Ing. Vladimír Kutiš, PhD., Ing. Róbert Fric   |
| Research Worker      | Ing. Andrej Kalaš   |
| Technical Staff      | Katarína Beringerová (secretary), František Erdödy  |
| PhD. Students        | Ing. Vladimír Ďuriš, Ing. Miroslav Kropáč, Ing. Miloš Remiš,<br>Ing. Branislav Böhmer, Ing. Marián Masný, Ing. Peter Kmotřík,<br>Ing. Vladimír Goga, Ing. Tomáš Furinda, Ing. Viktor Královič,<br>Ing. Marcel Virág |

**II. EQUIPMENT**

**II.1 Teaching and Research Laboratories**

- Laboratory of Thermopower Machines and Devices
- Laboratory of Mechanics of Strength and Yielding Bodies
- Centre of Designing and Computational Mechanics

**II.2 Special Measuring Instruments and Computers**

- Boiler Gas Analyser Industrial Combustion Optimiser Neotronics
- Experimental Impulse Turbine F800 - Hilton, Ltd. England
- Hewlett-Packard PC Workstations Kayak

**III. TEACHING**

**III.1 Undergraduate Study (Bc.)**

Subject, semester, hours per week for lectures and for seminars or practical exercises, name of lecturer

|  |                  |                           |
|--|------------------|---------------------------|
| CAD in Technical Documentation                   | (opt.sem., 1-3h) | J.Veselovský              |
| Basis of Engineering and Technical Documentation | (1st sem., 2-2h) | J. Veselovský<br>B. Hučko |
| Basis of Engineering                             | (1st sem., 2-2h) | B. Hučko                  |
| Mechanics  | (5th sem., 3-2h) | J.Murín                   |
| Thermomechanics                                  | (6th sem., 3-2h) | J.Murín                   |
| Structural Elements and Systems                  | (6th sem., 3-2h) | B.Hučko                   |
| Designing by Higher CAD Systems                  | (8th sem., 1-3h) | B.Hučko                   |

**III.2 Graduate Study (Ing.)**

|                             |                  |              |
|-----------------------------|------------------|--------------|
| Nuclear Power Facilities II | (1st sem., 2-2h) | B.Hučko      |
| Applied Mechanics           | (2nd sem., 2-2h) | J.Murín      |
| Designing of Luminaires     | (2nd sem., 3-2h) | J.Veselovský |

**III.3 Undergraduate and Graduate Study for Foreign Students****(in English Language)**

|                      |                  |         |
|----------------------|------------------|---------|
| Basis of Engineering | (1st sem., 2-2h) | B.Hučko |
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**IV. RESEARCH PROJECTS**

- Bar Finite Element with Varying Parameters for Multiphysical Computations. G 1/1100/04, J. Murín
- Stress and Deformation Analyses in Thin Micro- and Nano-Systems and Devices Containing Piezoelectric Elements, Inverse Piezoelectric Problem. G 1/0149/03, B.Hučko
- Advanced Computational Methods in Solid Mechanics. Project Science and technology assistance agency. Cooperation between Institute of Construction and Architecture, Slovak Academy of Sciences, and Department of Mechanics and Strength, Mechanical Faculty of Technical University Žilina, J. Murín
- Digitalisation of Control and Protection Algorithms in Electrical Systems. G 1/0166/03, J. Murín
- Forming Curves and Construction of Reflectors for Luminaires. G 0151, J. Murín, J. Veselovský, M. Kropáč

**V. COOPERATION****V.1 Cooperation in Slovakia**

- VÚJE a.s., Trnava
- Sova a.s., Bratislava
- JE Jaslovské Bohunice
- JE Mochovce
- Energovýzkum s.r.o., Brno, CzR
- SjF ŽU Žilina
- Škoda Auto Slovensko, Bratislava
- Institute of Construction and Architecture, Slovak Academy of Sciences
- IPT Pezinok
- OMS Senica

**V.2 International Cooperation**

- Technical University Vienna, Austria
- Technical University Ilmenau, Germany
- University College of Swansea, United Kingdom

**V.3 Membership in Slovak Organizations and Societies**

- Co-chairman in Slovak Society for Mechanics (J. Murín)
- Technical Committees of SUTN Fasteners, Technical drawings (J.Veselovský)

#### **V.4 Membership in International Organizations and Societies**

- B.Hučko, J.Murín: Central European Association for Computational Mechanics
- J. Murín: Institute of Structural Mechanics, TU Vienna, Austria
- J. Veselovský: ISO Technical Committee 1, ISO Technical Committee 2

#### **VI. THESES**

##### **VI.1 Master Theses**

Master theses supervised at the Department of Mechanics. The names of supervisors are in brackets.

- [1] E. Czapffová: Modelling and simulation of temperature rise of the power line conductor joint, (J. Murín).
- [2] P. Dufek: Modelling and simulation of ground wire cable heating with calorific conductor, (J. Murín).
- [3] J. Lukáč: Calculations of encapsulated conductors heating, (J. Murín).
- [4] R. Kellner: Modelling of optical parts of fluorescent lamps, (J. Veselovský).
- [5] I. Chmel: Creating of digital thermo-physical tables of material properties and their application in FEM analysis, (V. Kutíš).

##### **VI.2 Doctoral Theses**

- [1] R. Fric: Diagnostics of heating in selected lighting devices, (J. Murín).

#### **VII. OTHER ACTIVITIES**

- Membership in the editorial board of journal : Mechanical Engineering (J. Murín)

#### **VIII. PUBLICATIONS**

##### **VIII.1 Journals**

- [1] HARSÁNYI, Z., JANÍČEK, F., LELÁK, J., MURÍN, J.: Compensator of Thermal Flow. In: EE - časopis pre elektrotechniku a energetiku. - Vol.11, No.6 (2005) - p. 44. (in Slovak)
- [2] KROPÁČ, M., MURÍN, J.: Design and Analysis of Headlights. In: EE - časopis pre elektrotechniku a energetiku. - Vol.11, Special Issue (2005) - pp. 89-91. (in Slovak)
- [3] KUTIŠ, V., MURÍN, J.: Bar Element with Variation of Cross-Section for Geometric Non-Linear Analysis. In: Journal of Computational and Applied Mechanics. - Vol.6, No.1 (2005) - pp. 83-94. (in English)
- [4] MURÍN, J., KUTIŠ, V., MASNÝ, M.: Link Element with Variation of Thermal Conduction for Thermal Analysis. In: Strojnícky časopis. - Vol.56, No.3 (2005) - pp. 162-176. (in English)
- [5] VIRÁG, M., MURÍN, J.: Thermal Field Simulation of a Tungsten Filament Lamp Referring to Its Lifetime. In: Journal of Electrical Engineering. - Vol.56, No.9-10 (2005) - pp. 252-257. (in English)

**VIII.2 Conferences**

- [1] ĎURIŠ, R., MURÍN, J., KUTIŠ, V.: Bar Element with Varying Stiffness for Geometric and Material Nonlinearity. In: 10th International Conference on Numerical Methods in Continuum Mechanics & 4th Workshop on Trefftz Methods : Žilina, Slovak Republic, 23.-26.8.2005. CD-Rom. (in English)
- [2] FRIC, R.: Analysis of the Temperature Field in the Light Source. In: 16th International Conference Light 2005 : Jasná, Slovak Republic, 19.-21.10.2005. pp. 73-78. (in English)
- [3] FRIC, R.: FEM Analysis of the Heating of the Lighting Device Component. In: 7th Conference for PhD Students ELITECH 2005 : Bratislava, Slovak Republic, 9.2.2005. pp. 10-12. (in English)
- [4] GOGA, V., KMOTRIK, P.: Elastic-Static and Dynamic Analysis of the High Voltage Cable. In: 7th Conference for PhD Students ELITECH 2005 : Bratislava, Slovak Republic, 9.2.2005. pp. 2-5. (in English)
- [5] GOGA, V., KMOTRÍK, P.: Influence and Calculation of the Shear Deflection Coefficient. In: International Scientific Conference "Applied Mechanics" : Ostrava, Czech Republic, 7.-9.9.2005. pp. 281-285. (in English)
- [6] HUČKO, B.: CAX Technologies in Education Process at FEI STU. In: International Scientific Conference "New Trends in Designing and Creation of Technical Documentation 2005" : Nitra, Slovak Republic, 26.5.2005. pp. 52-53. (in English)
- [7] KALAŠ, A.: Experiences with Patent Applications. In: International Scientific Conference "New Trends in Designing and Creation of Technical Documentation 2005" : Nitra, Slovak Republic, 26.5.2005. pp. 169-172. (in English)
- [8] KALAŠ, A.: Guidelines for Writing Patent Applications. In: 46th International Conference of Machine Design Departments : Sedmihorky, Czech Republic, 6.-9.9.2005. pp. 137-140. (in English)
- [9] KMOTRIK, P., GOGA, V.: Creation of the Transmission Line Model for Dynamic Analysis. In: 7th Conference for PhD Students ELITECH 2005 : Bratislava, Slovak Republic, 9.2.2005. pp. 6-9. (in English)
- [10] KMOTRIK, P., GOGA, V.: Design and Mechanical Analyses of the Goniophometer. In: 16th International Conference Light 2005 : Jasná, Slovak Republic, 19.-21.10.2005. pp. 333-338. (in English)
- [11] KMOTRÍK, P., GOGA, V.: Design and Mechanical Analyses of the Goniophotometer. In: International Scientific Conference "Applied Mechanics" : Ostrava, Czech Republic, 7.-9.9.2005. pp. 127-132. (in English)
- [12] KROPÁČ, M., MURÍN, J.: Numerical Solution of Coupled Light-Structural Problem. In: 10th International Conference on Numerical Methods in Continuum Mechanics & 4th Workshop on Trefftz Methods : Žilina, Slovak Republic, 23.-26.8.2005. CD-Rom. (in English)
- [13] KUTIŠ, V., MURÍN, J.: Mechanical and Thermal Analysis of Luminaire. In: 10th International Conference on Numerical Methods in Continuum Mechanics & 4th Workshop on Trefftz Methods : Žilina, Slovak Republic, 23.-26.8.2005. CD-Rom. (in English)

- [14] KUTIŠ, V., VESELOVSKÝ, J., MURÍN, J.: Design and Simulation of Locking Clip of Street Luminaire. In: 46th International Conference of Machine Design Departments : Sedmihorky, Czech Republic, 6.-9.9.2005. pp. 186-189. (in English)
- [15] MASNÝ, M.: Multiphysics Simulation of Cable Arrangements of 22 kV Cu 1x240/25 mm<sup>2</sup> FEM. In: 10th International Conference on Numerical Methods in Continuum Mechanics & 4th Workshop on Trefftz Methods : Žilina, Slovak Republic, 23.-26.8.2005. CD-Rom. (in English)
- [16] MASNÝ, M.: Solution of Coupled Field Problems by Finite Element Method (Thermal - Fluid Field). In: 7th Conference for PhD Students ELITECH 2005 : Bratislava, Slovak Republic, 9.2.2005. pp. 13-16. (in English)
- [17] MURÍN, J., KUTIŠ, V.: Effective Solution of Thermoelasticity for Uniaxially Graded Materials with FEM. In: International Scientific Conference "Applied Mechanics" : Ostrava, Czech Republic, 7.-9.9.2005. pp. 297-302. (in English)
- [18] MURÍN, J., KUTIŠ, V.: Thermoelasticity of Beams with Functionally Graded Materials. In: 4th International Conference on New Trends in Statics and Dynamics of Buildings : Bratislava, Slovak Republic, 20.-21.10.2005. pp. 11-14. (in English)
- [19] MURÍN, J., KUTIŠ, V., MASNÝ, M.: Multiphysical Link (BEAM) Element with Continuous Variation of Material Properties. In: VIII International Conference on Computational Plasticity - COMPLAS 2005 : Barcelona, Spain, 5.-8.9.2005. pp. 1154-1157. (in English)
- [20] MURÍN, J., KUTIŠ, V., MASNÝ, M.: Multiphysical Link Element with Varying Electric and Thermal Conductance. In: 10th International Conference on Numerical Methods in Continuum Mechanics & 4th Workshop on Trefftz Methods : Žilina, Slovak Republic, 23.-26.8.2005. CD-Rom. (in English)
- [21] VESELOVSKÝ, J., HUČKO, B.: High-Strength Structural Joints of HV Type for Preloading with Hexagon Bolts. In: International Scientific Conference "New Trends in Designing and Creation of Technical Documentation 2005" : Nitra, Slovak Republic, 26.5.2005. pp. 143-146. (in English)
- [22] VESELOVSKÝ, J., HUČKO, B.: Quality Improvement of Lectures Using Powerpoint. In: International Scientific Conference "New Trends in Designing and Creation of Technical Documentation 2005" : Nitra, Slovak Republic, 26.5.2005. pp. 182-185. (in English)
- [23] VESELOVSKÝ, J., HUČKO, B.: Spatial Imagination in Students' Visions. In: 46th International Conference of Machine Design Departments : Sedmihorky, Czech Republic, 6.-9.9.2005. pp. 361-364. (in English)
- [24] VESELOVSKÝ, J., HUČKO, B.: Structural Bolting of Type HR for High-Strength Joints. In: International Scientific Conference "New Trends in Designing and Creation of Technical Documentation 2005" : Nitra, Slovak Republic, 26.5.2005. pp. 147-150. (in English)
- [25] VIRÁG, M., MURÍN, J.: The Thermal Field Simulation of Tungsten Filament Lamp Referring to Its Lifetime. In: 16th International Conference Light 2005 : Jasná, Slovak Republic, 19.-21.10.2005. pp. 347-352. (in English)

**VIII.3 Books**

- [1] LEINVEBER, J., VESELOVSKÝ, J.: Technical Drawing. - Bratislava: Alfa-press, 2005. - 209 pp. (in Slovak)
- [2] SEDLÁR, T., VESELOVSKÝ, J.: Technology I, II, III. - Bratislava: Alfa-press, 2005. - 224 pp. (in Slovak)

**VIII.4 Textbook**

- [1] DARUĽA, I., HUČKO, B.: Power Stations I. - Bratislava: FEI STU, 2005. - 94 pp. (in Slovak)

**VIII.5 Standards**

- [1] Countersinks for Costersunk Head Screws with Head Configuration in Accordance with ISO 7721. / Aut.: VESELOVSKÝ, J. - No. STN EN ISO 15065. Date: Sept. 2005. - 8 pp. (in Slovak)
- [2] High-Strength Structural Bolting Assemblies for preloading. Part 1: General Requirements. / Aut.: VESELOVSKÝ, J. - No. STN EN 14399-1. Date: Sept. 2005. - 24 pp. (in Slovak)
- [3] High-Strength Structural Bolting Assemblies for preloading. Part 2: Suitability Test for Preloading. / Aut.: VESELOVSKÝ, J. - No. STN EN 14399-2. Date: Sept. 2005. - 16 pp. (in Slovak)
- [4] High-Strength Structural Bolting Assemblies for preloading. Part 3: System HR. Hexagon Bolt and Nut Assemblies. / Aut.: VESELOVSKÝ, J. - No. STN EN 14399-3. Date: Sept. 2005. - 20 pp. (in Slovak)
- [5] High-Strength Structural Bolting Assemblies for preloading. Part 4: System HV. Hexagon Bolt and Nut Assemblies. / Aut.: VESELOVSKÝ, J. - No. STN EN 14399-4. Date: Sept. 2005. - 20 pp. (in Slovak)
- [6] High-Strength Structural Bolting Assemblies for preloading. Part 5: Plain Washers. / Aut.: VESELOVSKÝ, J. - No. STN EN 14399-5. Date: Sept. 2005. - 12 pp. (in Slovak)
- [7] High-Strength Structural Bolting Assemblies for preloading. Part 6: Plain Chamfered Washers. / Aut.: VESELOVSKÝ, J. - No. STN EN 14399-6. Date: Sept. 2005. - 12 pp. (in Slovak)