

**Technical University of Łódź**  
**Faculty of Material Technologies**  
**and Textile Design**

**Department**  
**of Technical Mechanics**  
**and Computer Engineering**

**Head of department:**

Prof. Krzysztof Dems, Ph.D., D.Sc., Eng.

**Current research topics:**

- Modelling and identification of the mechanical properties of textile composite materials
- Optimisation of the mechanical and thermal properties of fibre reinforced composites
- Sensitivity analysis and optimal design of the shape and thermomechanical properties of structural elements
- Identification and computer oriented simulation of defects in structures using thermographic methods and modal analysis

**Area of research activities:**

- Mechanics of textiles, textile structures and composites
- Theory and application of textile and structural mechanics
- Sensitivity analysis and optimal design of structures subjected to thermal and mechanical loads
- Numerical methods in textile and structural mechanics
- Computer-oriented analysis, synthesis and optimisation of materials and structures
- Operation of textile machinery and its reliability
- Application of computer science in textile and mechanical engineering

**Research achievements:**

- Creation of a scientific school with varied approaches to optimal design, identification and sensitivity analysis of structural elements, textile products, composite structures subjected to thermal and mechanical loads
- Creation of principles for the modelling of textile products subjected to static and dynamic loads
- Computer oriented analysis and synthesis of textile products, composite structures and structural elements subjected to mechanical and thermal loads

**For more information please contact:**

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