FACULTY OF CIVIL ENGINEERING
institute of structural mechanics

On-stand Brno:
20.–24. 4. 2026

Virtual part:
15. 4. 2026 at 14:00

Blended Intensive Programme (BIP): ERASMUS+

Application of numerical methods for mechanical behaviour analysis and experiment comparison

Objectives and description

The aim of the program is to familiarize students with application of numerical methods for the mechanical behaviour analysis and experiment comparison – in particular various methods of numerical simulation. During the classes, students will have the opportunity to learn about the numerical methods for structure solution and prepare some models of Membrane Structures.

Methods and outcomes

- Lectures of advanced teachers/experts, technical excursion and laboratories visit
- 3 ECTS credits

Level of study: Bc., MSc., Ph.D. students

Virtual component description

Introduction: Brno City, Transport etc.; Brno University of Technology (BUT), Faculty of Civil Engineering (FCE); BIP thematic sessions, and goals for BIP and plan of on-stand part.

Language

English

Topics:

1. A brief historical reference to the theory of elasticity. Fields in the theory of the continua and the definition of state variables.
2. Basic equations of elasticity. The derivation of geometric equations and physics equations. The properties of the strain and stress tensors. The equilibrium conditions and compatibility conditions.
3. Analysis of stress and strain in point. Plane stress and plane strain
4. The potential energy of deformation and strain of work. Energy principles.
5. The principle of virtual work and variational methods in continuum mechanics.
6. Theory of plates. Types of plates, boundary conditions. Special types of plates.
7. Introduction to the theory of shells. Membrane and bending state of stress. Internal forces with shells.
8. Technical excursions on selected construction
9. Cylindrical shells - basic equations of the bending theory of cylindrical shells. Flat shell.

The great thing about Erasmus+ Blended Intensive Program (BIP), is that you receive a grant for travel and accommodation expenses of at least 79 EUR per day of real part of the programme. If you opt for a sustainable mode of transportation (for example, travelling by train the entire journey), you will receive at least 50 EUR extra.

Please consult your university International Cooperation Office representative for more information.

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Partners

- Brno University of Technology, Czech Republic
- University of Malaga, Spain
- University of Sevilla, Spain
- University of Oviedo, Spain
- University of Košice, Slovakia
- University of Žilina, Slovakia
- Faculty of Civil Engineering STU Bratislava, Slovakia
- Wrocław University of Science and Technology, Poland
- University of Koszalin, Poland
- University of Warmia and Mazury in Olsztyn, Poland
- Vienna University of Technology, Austria

BIP ID: 2024-1-CZ01-KA131-HED-000217245-1

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