

Information sheet for the course: Computational Modeling in Materials Engineering I**University:** Alexander Dubček University of Trenčín**Faculty:** Faculty of Industrial Technologies in Púchov**Course unit code:** MI-I-P-2**Course unit title:** Computational Modeling in Materials Engineering I**Form, scope and method of educational activity:****Form of study:** Lecture / Seminar / Laboratory tutorial**Recommended number of lessons (hours):****Weekly:** 1 / 0 / 3 **During the semester:** 12 / 0 / 36 **Method of study:** attendance method**Number of credits:** 5**Recommended semester:** 1.**Degree of study:** The 2nd degree of study**Course prerequisites:****Assessment methods:**

Assessment during the semester:

Summary assessment of work results during the semester = 40 points

Semester work - project and independent work during the semester.

Final assessment:

Assessment of exam results = 60 points

Grading scale:

Grade A: 91 – 100 points

Grade B: 81 – 90 points

Grade C: 71 – 80 points

Grade D: 61 – 70 points

Grade E: 55 – 60 points

Grade FX: less than 55 points

Learning outcomes of the course unit:

The student can independently solve tasks in the field of computational modeling using FEM, in the field of linear statics and dynamics of constructions and material structures.

Course contents:

FEM modeling and general considerations.

General post-processing.

Types of finite elements (plane stress, plane strain, axisymmetric bodies).

3D Finite Elements, Plates, Shells and Solids.

Material properties: isotropic, orthotropic, anisotropic.

Static and geometric boundary conditions.

Symmetry and antisymmetry.

Creating a model.

Volume modeling and direct generation.

Boolean operations.

Element attributes.

Importing volume models from CAD systems.

Bar and beam elements.

Input data.

Post-processing.

Analysis of 2D structures.

Special elements, elements of fracture mechanics.

Concentration of tension.

Dynamic analysis of structures.
Harmonic and transient analysis.
Analysis of structures with damping.

Recommended of required reading:

SPYRAKOS, C.C.: Finite Element Modeling Engineering Practice. Algor, Inc., 1994.
E-learning TnUAD.

Language:

English

Remarks: Compulsory course / Profile course

Evaluation history: 0

Total number of graded students:

A	B	C	D	E	FX
0.0	0.0	0.0	0.0	0.0	0.0

Lecturers: Associate professor Ing. Ján Vavro, PhD.

Last modification: 31.08.2022

Supervisor: prof. RNDr. Mariana Pajtášová, PhD.