

Title Computational Methods in Mechanics of Structures	Code 10102242710102101544
Field Mechanical Engineering	Year / Semester 4 / 7
Specialty -	Course core
Hours Lectures: 1 Classes: 10 Laboratory: - Projects / seminars: -	Number of credits 2
	Language polish

Lecturer:

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Faculty:

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Status of the course in the study program:

- Core course at the Faculty of Mechanical Engineering and Management, field of study Mechanical Engineering

Assumptions and objectives of the course:

- The student should gain theoretical knowledge and practice in numerical solving of mechanics problems and structures optimization in engineering problems.

Contents of the course (course description):

- Introduction to the Finite Difference Method (FDM). Boundary value problems for ordinary and partial differential equations. Selection and obtaining finite difference schemes for a certain differential operator. Finite Difference Methods for heat transfer problems. Solving systems of equations with banded matrices. Optimization, numerical minimization of functions.

Introductory courses and the required pre-knowledge:

- Mathematical analysis, ordinary and partial differential equations, vector and matrix calculus. Basic skills in programming and numerical methods.

Courses form and teaching methods:

- Lectures aided by presentations of examples in FDM calculations.
Laboratory: solving selected problems.

Form and terms of complete the course - requirements and assessment methods:

- Laboratory reports containing: problem description, theoretical fundamentals ? equations and conditions, presentation of results and their analysis with conclusions and summary.
Test which examines students? theoretical knowledge.

Basic Bibliography:

Additional Bibliography: