

Title Strength of Materials and Structures	Code 10102553110102102546
Field Mechatronics ? graduate studies (II degree), variant III	Year / Semester 1 / 1
Specialty -	Course core
Hours Lectures: 2 Classes: 1 Laboratory: 1 Projects / seminars: -	Number of credits 4
	Language polish

Lecturer:

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Faculty:

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Status of the course in the study program:

- This is one of the core courses for graduate studies in the field of Mechatronics at the Faculty of Mechanical Engineering and Management, variant III for undergraduates in the field of Electrical Engineering and Control Engineering and Robotics.

Assumptions and objectives of the course:

- To provide concise introduction to key topics related to strength of materials applied in design of mechatronic structures. Discussion of basic calculation procedures. Students should be able to learn the basic theoretical knowledge and possess skills for solving practical engineering problems and perform simple strength experiments.

Contents of the course (course description):

- Introduction to key topics related to strength of materials.
Calculation models in strength of materials related to real engineering structures.
Safety and reliability of mechanical structures.
Calculation procedures for composite structures, (bars, shafts and beams).
Introduction to the strain energy methods.
The theorem of Castigliano and Menabrea's theorem.
Strength calculations of frames and arcs.
Analysis of thin-walled vessels.
Thick-walled pressure vessels ? Lamé's equations.
Stress and strain in rotating discs.
Strength analysis of thin-walled plates.
Fundamentals of optimal design of structures.

Introductory courses and the required pre-knowledge:

- Fundamentals of mathematics. Knowledge of mechanics and strength of materials on under-graduate level. Elementary skills in engineering drawing.

Courses form and teaching methods:

- Lectures supported by slides presentations.
Classes focused on solving practical engineering problems.
Laboratory classes focused on experiments and exercises

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

- Written tests in the scope of theoretical and practical knowledge.

Basic Bibliography:

Additional Bibliography: