| Title | Code |
|---|---|
| **Strength of Materials** | **1010101121010110024** |
| Field: **Civil Engineering First-cycle Studies** | Year / Semester: **1 / 2** |
| Specialty: **-** | Course: **core** |
| Hours: Lectures: **3** Classes: **2** Laboratory: **-** Projects / seminars: **2** | Number of credits: **10** |
| | Language: **polish** |

## Lecturer:

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## Faculty:

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## Status of the course in the study program:

Obligatory course for students of all specialities of Civil Engineering

## Assumptions and objectives of the course:

Ability to determine internal forces, state of stress and strain in statically determinate rod structures, understanding main principles of detail the structural elements in ultimate and serviceability limit states, understanding the difference between dimensioning in elastic and plastic states, understanding the importance of structural stability analysis.

## Contents of the course (course description):

Idealization of structural models: 1D (rod, truss, beam, column, frame, arch, grid), 2D (plate, slab, shell), 3D (block). Actions: loads, temperature. First and second moments of area. Boundary Value Problem of linear elasticity. Internal forces in statically determinate rod structures. State of stress and strain in special cases: axial tension, pure bending, bending with shear force, skew bending, eccentric tension, torsion. Displacements of beams. Elastic energy. Non-linear behavior of materials, plasticity. Equivalent stress measures. Elements of limit load analysis. Stability of a column. Reological phenomena. Stress concentration. Fatigue. Elements of mechanics of thin walled rods. Experimental methods.

## Introductory courses and the required pre-knowledge:

Knowledge of mathematics and mechanics according to program of previous courses

## Courses form and teaching methods:

Lectures, tutorials (traditional presentation) and projects

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

Evaluation of projects, written tests and written and oral examination

## Basic Bibliography:

## Additional Bibliography: