Title	Code
Structural mechanics	
Field: **Civil Engineering**	Year / Semester
Specialty: **-**	Course: **core**
Hours: Lectures: Classes: Laboratory: **-** Projects / seminars:	Number of credits

Lecturer:

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Status of the course in the study program:

The subject belongs to the main course subjects.

Objectives of the course:

Theoretical background and knowledge of models in plane bar systems mechanics. Skill in calculation of internal forces and generalized displacements in statically determinate and indeterminate structures. Calculation of critical loading for elastic frames. Knowledge of basic concepts in dynamics of bar systems and determination of natural frequencies and dynamic coefficients.

Course description:

Models of structural systems. Principle of virtual work, reciprocal theorems. Maxwell-Mohr formula. Statically indeterminate bar systems. Solution of frames, continuous beams, trusses and arches by the flexibility method. Influence of generalized forces, temperature changes and support displacements.. Reduction theorems. Slope-deflection formulae for beams. Equations of kinematic chain. Stiffness method for kinematically indeterminate frames. Slope-deflection formulae for beams with axial force. Foundations of structural dynamics. Free and forced vibrations with and without damping for one-degree-of-freedom system. Dynamics of simple frames with discrete mass distribution.

Initial knowledge:

Basic knowledge in mechanics, strength of materials and applied mathematics: differential and integral calculus, vector and matrix calculus.

Teaching methods:

Lectures, example classes and projects.

Assessment methods:

Written examination, written tests in tutorials, individual examples.

Bibliography:

1. Mechanika budowli, W. Nowacki , PWN, Warszawa , 1974
2. Mechanika budowli (t.I+II), Z. Dyląg i in, PWN, Warszawa, 1989
3. Mechanika budowli w zadaniach (t.I+II), Z. Cywiński, PWN, Warszawa, 1976
4. Mechanika budowli cz.I+II, skrypt oprac. przez studentów, www.intranet.put.poznan.pl
5. Mechanika budowli. Zadania część 1, J. Rakowski, Wydawnictwo PP, Poznań, 2007

http://www.put.poznan.pl/

6. Zbiór zadań z mechaniki budowli, M. Guminiak, J. Rakowski, Wydawnictwo PWSZ, Piła, 2008

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