STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Structural Mechanics		**1010101131010110048**
Field of study	Profile of study (general academic, practical)	Year /Semester
Civil Engineering First-cycle Studies	**(brak)**	**2 / 3**
Elective path/specialty	Subject offered in:	Course (compulsory, elective)
-	**Polish**	**obligatory**
Cycle of study:	Form of study (full-time,part-time)	
First-cycle studies	**full-time**	
No. of hours		No. of credits
Lecture: **15** Classes: **15** Laboratory: **-** Project/seminars: **15**		**5**
Status of the course in the study program (Basic, major, other)	(university-wide, from another field)	
(brak)	**(brak)**	
Education areas and fields of science and art		ECTS distribution (number and %)

Responsible for subject / lecturer:

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Prerequisites in terms of knowledge, skills and social competencies:

1	**Knowledge**	Basic knowledge of the following subjects: mathematics, theoretical mechanics, strength of materials, covered during Civil Engineering or other similar type of studies up to the Bachelor of Science degree.
2	**Skills**	Capability to apply the aquired knowledge and obtain futher information from the literature. One is capable to apply the theoretical knowledge to solve practical problems.
3	**Social competencies**	Awareness about necessity of expending the theoretical knowledge in order to justify its application during the professional career. Understanding the necessity of constant education.

Assumptions and 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. Influence lines of statical quantities in bar structures.

Study outcomes and reference to the educational results for a field of study

Knowledge:

1. Student knows the basic theorems and rules of linear structural mechanics. - [K_W03]
2. Student knows the relations between displacements and loads in statics of simple linear beams. - [K_W03]
3. Student knows methods of numerical models formation of arbitrary plane bar structures. - [K_W03]

Skills:

1. Student can compute the distribution of internal forces and deformations of plane bar structures caused by arbitrary external loads, thermal and kinematic effects. - [K_U04]
2. Student can determine influence functions of static quantities caused by moving loads. - [K_U04]
3. Student can make an appriopriate chise of the calculation method of plane bar structures. - [K_U04, K_U06]

Social competencies:

1. Student is capable to work individually as well as in the team. - [K_K02]
2. Student is aware of the responsibility arising from the accuracy of obtained results and is able to provide the interpretation. - [K_K02]
3. Student is aware of the necessity of constant education and knowledge expansion. - [K_K10]

Assessment methods of study outcomes

1) Lectures

The lectures will be summarised by written exam (two terms). Each exam takes 2.5 hours - each student receives test with individual and unique problems. The final mark is the summation of all the answers provided to the given problems, passing note in scale 2=unsatisfactory, 5=very good can be granted after obtaining at least 50% of the maximum amount of points.

2) Classes

two written tests during the semester

3) Projects

- each student receives the set of unique problems which must be solved and descrived individually (projects)
- number of projects: 2
- during the projects the individual help will be granted and the solving problems knowledge will be tested
- final grade for each projects will be based on the quality of the project as well as the result of the quiz
- dates of each quiz will be set at the beginning of the semester

Course description

Models of structural systems. Statically determinate bar systems: internal forces, influence lines, displacemets. Principle of virtual work, reciprocal theorems. Maxwell-Mofr formula. Statically indeterminate bar systems. Solution of frames, continuous beams, trusses by the flexibility method. Influence of generalized forces, temperature changes and support displacements. Influence lines of reactions, internal forces and displacements. reduction theorems.

Teaching methods: lecture - informative, monographic, exercises - exercise and project methods.

Basic bibliography:

1. W. Nowacki, Mechanika budowli, PWN, Warszawa 1974
2. Z. Dyląg i in., Mechanika budowli (t.I+II), PWN, Warszawa 1989
3. Z. Cywiński, Mechanika budowli w zadaniach (t.I+II), PWN, Warszawa 1976
4. J. Rakowski, Mechanika budowli, Zadania cz.1, Wydawnictwo PP, Poznań 2007
5. M. Guminiak, J. Rakowski, Zbiór zadań z mechaniki budowli, Wydawnictwo PWSZ, Piła 2008
6. M. Guminiak, J. Rakowski, Mechanika budowli. Zbiór zadań z elementami ujęcia komputerowego, Wydawnictwo PWSZ, Piła 2011

Additional bibliography:

1. Skrypt internetowy, Mechanika budowli, www.ikb.put.poznan.pl/node/49

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectures, classes and projects	45
2. Completing the projects	20
3. Preparation to the written tests and exam	30
4. Independent research of the available literature and solving additional problems	25
5. Consultations	5

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	50	2
Practical activities	80	3