STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Structural Mechanics		**1010101131010100048**
Field of study	Profile of study (general academic, practical)	Year /Semester
Sustainable Building Engineering First-cycle	**(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**		**3**
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**	Has basic knowledge in mathematics, theoretical mechanics, strength of materials in the scope present in civil engineering studies or similar
2	**Skills**	Can efficiently use the knowledge and get it from available bibliographic. Can apply the known theory to solve pracitcal problems.
3	**Social competencies**	Is concious of the necessity to broaden the theoretical knowledge to justify its use in the practical aspects of his work. Undestands the necessity of continuous self-education.

Assumptions and objectives of the course:

Knowledge in theoretical foundations and mechanical models of bar structures. Knowlegde of principles for computation of internal forces ad displacements in statically determinate and indeterminate systems. Knowledge of influence lines of static quantities.

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

Knowledge:

1. Knows the basic theorems and principles of linear structural mechanics - [KSB_W06]
2. Knows th erelations between displacements and loading for straight bars - [KSB_W06]
3. Knows the methods to formulate computational models for arbitrary plane bar structures - [KSB_W06]

Skills:

1. can compute the distributions of internal forces and displacements due to arbitrary loading, thermal influences and support displacements in statically indeterminate systems - [KSB_U06]
2. can compute the functions of static quantities due to moving loads - [KSB_U06]
3. can select appropriate methods to compute forces and displacements in bar systems - [KSB_U07]

Social competencies:

1. knows the responsibility for the correctness of performed computations and can give the physical interpretation thereof - [KSB_K02]
2. understands the necessity of continuous broadening of knowledge - [KSB_K05]

Assessment methods of study outcomes

- 2 written tests
- 2 exercises

Assessment of lecture

Based on the marks for tests

Assessment of classes

2 written tests:

- computation of displacements using the principle of virtual work
- flexibility method

Mark ranges

91 ? 100% very good (5.0)

81 ? 90% good plus (4.5)

71 ? 80% good(4.0)

61 ? 70% satisfactory plus (3.5)

51 ? 60% satisfactory (3.0)

<50% unsatisfactory(2.0)

Assessment of exercises

Each studens solves two individual exercises

- verification during individual consultations
- marks - verification of involved knowledge during the tests

Course description

Models of structural systems. Statically determinate systems - internal forces, influence lines, displacements. Principle of virtual work, reciprocity theorems. Maxwell-Mohr formula. Statically indeterminate systems. Solution of frames continuous beams and trusses by the flexibility method - influence of loading, thermal action, support displacements. Influence lines of reactions, internal forces and displacements. Reduction theorems. Slope-deflection formulae for straight beams. Kinematic chain. Introduction to the stiffness method.

Basic bibliography:

1. Skrypt internetowy, Structural Mechanics I, www.ikb.poznan.pl/przemyslaw.litewka (w przygotowaniu)
2. RC Coates, MG Coutie, FK Kong, Structural Analysis, Van Nostrand Reinhold, 3dr Ed., 1988
3. W. Nowacki Mechanika budowli PWN Warszawa 1974
4. Z. Dyląg i in Mechanika budowli (t.I+II) PWN Warszawa 1989
5. Z. Cywiński Mechanika budowli w zadaniach (t.I+II) PWN Warszawa 1976

Additional bibliography:

1. . OA Bauchau, JI Craig, Structural Analysis, Springer, 2009
2. Skrypt internetowy, Mechanika Budowli, www.intranet.put.poznan.pl
3. J. Rakowski Mechanika budowli. Zadania część 1 Wydawnictwo PP Poznań 2007
4. M. Guminiak, J. Rakowski Zbiór zadań z mechaniki budowli Wydawnictwo PWSZ Piła 2008
5. M. Guminiak, J. Rakowski Mechanika Budowli. Zbiór zadań z elementami ujęcia komputerowego Wydawnictwo PWSZ Piła 2011

Result of average student's workload

Activity	Time (working hours)
1. Participation in lectires	15
2. Participation in classes	15
3. Participation in exercise classes	15
4. Preparation to written tests	25
5. Literature studies, solving of additional examples	15
6. Consultations	5

Student’s workload

Source of workload	hours	ECTS
Total workload	90	3
Contact hours	50	2
Practical activities	50	2