STUDY MODULE DESCRIPTION FORM

Name of the module/subject **Structural Mechanics**		Code **1010101141010100048**
Field of study **Sustainable Building Engineering First-cycle**	Profile of study (general academic, practical) **(brak)**	Year /Semester **2 / 4**
Elective path/specialty **-**	Subject offered in: **Polish**	Course (compulsory, elective) **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time) **full-time**	
No. of hours Lecture: **15** Classes: **15** Laboratory: **-** Project/seminars: **15**		No. of credits **3**
Status of the course in the study program (Basic, major, other) **(brak)**	(university-wide, from another field) **(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 and in the structural mechanics from semester 3
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:

Solution of beams and frames by the stiffness method in classical and matrix version. Computation of critical force in frames. Knowledge in foundations of structural dynamics, computation of natural frequencies and dynamic coefficients.

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

Knowledge:

1. .knows relations between displacements and loading in the range of statics, stability and dynamics for straight beams - [KSB_W06]
2. knows methods to form calculation models for plane frame structures with lumped mass - [KSB_W06]
3. knows the influence of large axial forces on internal forces and displacements in plane frames - [KSB_W06]

Skills:

1. can compute the internals forces and displacements in bar structures subjected to forces, thermal influence or support displacements - [KSB_U06]
2. can choose an appropriate method to solve plane bar structure - [KSB_U06]
3. can formulate equilibrium conditions for simple frames within the second order theory - [KSB_U13]
4. can compute natural frequencies and amplitudes of forced harmonic vibrations for plane frames with discrete masses - [KSB_U13]

Social competencies:

1. is aware of responsibility for the correctness of the obtained results and can interpret the obtained results - [KSB_K02]
2. is aware of necessity to systematically expand knowledge - [KSB_K05]

Assessment methods of study outcomes

- written exam
- 2 written tests during the semester
- 2 individual exercises

Assessment of lecture

Written exam (two dates - one in June, the second one in September)

- exam duration time 2.5 hours

Marking

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)

Example class assessment

2 written tests

- stiffness mathod
- dynamics

Marking rules as with the exam

Exercise marking

Each student solves two individual exercises

- checking method - individual consultations
- mark yields from the special test within the example class test

Course description

Solution of kinematically indeterminate structures by the stiffness method. Slope-deflection formulae for elements loaded axially. Matrix version of stiffness method - stiffness matrix for a beam element. Second order theory and determinatio of critical loads. Stability of plane frames. Foundations of structural dynamics. Free and forced vibrations with and without damping for a single degree-of-freedom system. Dynamics of beams with continuous mass distribution - the slope-deflection formulae.

Metody dydaktyczne: wykład - informacyjny monograficzny, ćwiczenia - metoda ćwiczeniowa i metoda projektowa.

Basic bibliography:

Additional bibliography:

Result of average student's workload

Activity	Time (working hours)
1. Udział w wykładach (godziny kontaktowe)	15
2. Udział w ćwiczeniach (godziny kontaktowe)	15
3. Udział w projektach (godziny kontaktowe i praktyczne)	15
4. Przygotowanie do sprawdzianów pisemnych (ćwiczenia audytoryjne) i do egzaminu	25
5. Samodzielne studia literatury i wykonanie dodatkowych zadań obliczeniowych	15
6. Konsultacje	5

Student's workload

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