STUDY MODULE DESCRIPTION FORM

Name of the module/subject		Code
Structural Mechanics		**1010104151010100048**
Field of study: **Civil Engineering First-cycle Studies**	Profile of study (general academic, practical): **(brak)**	Year /Semester: **3 / 5**
Elective path/specialty: **-**	Subject offered in: **Polish**	Course (compulsory, elective): **obligatory**
Cycle of study: **First-cycle studies**	Form of study (full-time,part-time): **part-time**	
No. of hours: Lecture: **10** Classes: **10** Laboratory: **-** Project/seminars: **10**		No. of credits: **5**
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**	1. Student knows the basic concepts of static of statically determinate rod structures. 2. Student knows the basic concepts related to the strength of materials.
2	**Skills**	1. Student can calculate the internal forces in statically determinate rod structures. 2. Student can calculate the stress and strain in the cross sections of bars.
3	**Social competencies**	Student is responsible for brought a basic knowledge of general mechanics and strength of materials.

Assumptions and objectives of the course:

Knowledge of the theoretical models and mechanics flat rod systems. Learn how to calculate internal forces and displacements in the plane of generalized systems framework displacement method. Acquainted with the methods of calculation of stability and dynamics of simple rod systems.

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

Knowledge:

1. Manners to create computational models of flat bar structures in terms of the method of displacement. - [K_W04]
2. Manners to build discrete dynamic models for flat bar structures. - [K_W04]

Skills:

1. Calculate the internal forces in the frame by the displacement method. - [K_U04]
2. Calculate the natural vibration frequency and amplitude of the forced vibration harmonically simple rod systems with discrete mass distribution. - [K_U04]

Social competencies:

1. Student is responsible for the correctness of the calculations undertaken. - [K_K02, K_K10]
2. Student describes performed calculations and draw conclusions from their results. - [K_K02]

Assessment methods of study outcomes

Written and oral examination at the end of the semester.

One written tests checking the knowledge and skills in the subject.

Two design exercises for individual solutions.

Course description

Informative and monographic lecture.

1. Solving framework by the displacement method (transformational formulas, equations, canonical method of displacement).
2. The dynamic loading of the structure, free and forced vibration system with one degree of freedom. The phenomenon of resonance damping. Free and forced vibrations of an n-degrees of freedom.
3. Determination of influence lines for continuous beams.
4. Construction of the envelope of the internal forces of the moving load.

Basic bibliography:

1. W. Nowacki, Mechanika budowli, PWN, Warszawa, 1974.
2. Z. Dyląg i in., Mechanika budowli (t. I i II), PWN, Warszawa, 1989.
3. W. Nowacki, MECHANIKA BUDOWLI, PWN-Warszawa, 1974
4. J. Rakowski, MECHANIKA BUDOWLI, ZADANIA, CZĘŚĆ I, Wydawnictwo Politechniki Poznańskiej, 2007
5. W. Nowacki, Mechanika budowli, PWN, Warszawa, 1974.
6. Z. Dyląg i in., Mechanika budowli (t. I i II), PWN, Warszawa, 1989.

Additional bibliography:

1. Mechanika budowli. Zadania cz. I, J. Rakowski, Wydawnictwo PP, Poznań, 2007.
2. Zbiór zadań z mechaniki budowli. Wyd. II rozszerzone, M. Guminak, J. Rakowski, Wyd. PWSZ w Pile, 2009.
3. M. Guminiak, J. Rakowski, ZBIÓR ZADAŃ Z MECHANIKI BUDOWLI, wydanie drugie poprawione i uzupełnione, Wydawnictwo Państwowej Wyższej Szkoły Zawodowej im. Stanisława Staszica w Pile, 2009
4. M. Guminiak, J. Rakowski, MECHANIKA BUDOWLI, zbiór zadań z elementami ujęcia komputerowego, Wydawnictwo Państwowej Wyższej Szkoły Zawodowej im. Stanisława Staszica w Pile, 2011
5. J. Rakowski, Mechanika budowli. Wyd. Politechniki Poznańskiej, rok 2007.
6. M. Guminiak, J. Rakowski, Zbiór zadań z mechaniki budowli-wydanie dgrugie uzupełnione i poprawione. Wyd. PWSZ w Pile, rok 2009.

Result of average student's workload

Activity	Time (working hours)
1. Preparation of the first exercise design.	20
2. Preparation of the second exercise design.	20
3. Preparation of the first test.	15
4. Preparation of the second test.	15
5. Preparation of the exam.	15

Student's workload

Source of workload	hours	ECTS
Total workload	125	5
Contact hours	39	2
Practical activities	42	2