

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Structural Mechanics		Code 1010104141010110048
Field of study Civil Engineering First-cycle Studies	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) part-time	
No. of hours Lecture: 12 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 technical sciences		ECTS distribution (number and %) 5 100%
Responsible for subject / lecturer: Michał Guminiak, dr inż. email: michal.guminiak@put.poznan.pl tel. +48 61 665 2475 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		
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 of generalized systems statically determinate and indeterminate.		
Study outcomes and reference to the educational results for a field of study		
Knowledge:		
1. Relationships between displacements, and the load on the statics of simple rod systems. - [KW_04] 2. Basic principles and theorems of linear structural mechanics. - [KW_04] 3. Manners to create computational models of flat bar structures. - [KW_04]		
Skills:		
1. Determine influence lines of reaction and internal forces in simple beams and trusses statically determinate. - [KU_04] 2. Determine the distribution of internal forces and calculate the generalized displacement caused by any load, the influence of thermal and kinematic systems in flat rod systems (trusses, beams and frames). - [KU_04] 3. Determine the distribution of internal forces in statically indeterminate systems using flexibility methods. - [KU_04]		
Social competencies:		
1. Student is responsible for the correctness of the calculations undertaken. - [K_K02] 2. Student describes performed calculations and draw conclusions from their results. - [K_K02, K_K10]		
Assessment methods of study outcomes		
1. Written and oral examination at the end of the semester. 2. Two written tests checking the knowledge and skills in the subject. 3. Two exercises for individual design solutions.		

Course description		
1. Models structural systems. 2. Determination of influence lines for beams and trusses statically determinate. 3. The principle of virtual work. 4. Theorem: Betti, Maxwell and Rayleigh. 5. Statically indeterminate systems rod, the impact load forces generalized changes in temperature and settling supports. 6. Solving framework, continuous beams, trusses and arches using flexibility method.		
Basic bibliography: 1. W. Nowacki, MECHANIKA BUDOWLI, PWN-Warszawa, 1974 2. J. Rakowski, MECHANIKA BUDOWLI, ZADANIA, CZĘŚĆ I, Wydawnictwo Politechniki Poznańskiej, 2007 3. W. Nowacki, Mechanika budowli, PWN, Warszawa, 1974. 4. Z. Dyląg i in., Mechanika budowli (t. I i II), PWN, Warszawa, 1989.		
Additional bibliography: 1. 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 2. M. Guminiak, J. Rakowski, MECHANIKA BUDOWLI, zbiór zadań z elementami ujęcia komputerowego, Wydawnictwo Państwowej Wyższej Szkoły Zawodowej im. Stanisława Staszica w Pile, 2011 3. J. Rakowski, Mechanika budowli. Wyd. Politechniki Poznańskiej, rok 2007. 4. M. Guminiak, J. Rakowski, Zbiór zadań z mechaniki budowli-wydanie drugie 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.	12	
Student's workload		
Source of workload	hours	ECTS
Total workload	138	5
Contact hours	38	2
Practical activities	70	3