

STUDY MODULE DESCRIPTION FORM		
Name of the module/subject Civil Engineering Structures		Code 1010115131010110163
Field of study Civil Engineering Extramural Second-cycle	Profile of study (general academic, practical) general academic	Year /Semester 2 / 3
Elective path/specialty Structural Engineering	Subject offered in: Polish	Course (compulsory, elective) obligatory
Cycle of study: Second-cycle studies	Form of study (full-time, part-time) part-time	
No. of hours Lecture: 20 Classes: - Laboratory: - Project/seminars: 10		No. of credits 5
Status of the course in the study program (Basic, major, other) major		(university-wide, from another field) from field
Education areas and fields of science and art technical sciences Technical sciences		ECTS distribution (number and %) 5 100% 5 100%
Responsible for subject / lecturer: prof. dr hab. inż. Roman Lewandowski, prof. nadzw. email: roman.lewandowski@put.poznan.pl tel. +61 6652472 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań		Responsible for subject / lecturer: prof. dr hab. inż. Roman Lewandowski, prof. nadzw. email: roman.lewandowski@put.poznan.pl tel. +61 6652472 Faculty of Civil and Environmental Engineering ul. Piotrowo 5 60-965 Poznań
Prerequisites in terms of knowledge, skills and social competencies:		
1	Knowledge	Students have basic knowledge in a range of masonry, concrete and steel structures, strength of materials, structural mechanics, mechanics of grounds and settlements.
2	Skills	Students are able to perform dynamic calculation of simple structures, have basic knowledge concerning civil engineering and building materials.
3	Social competencies	Students are able to clearly describes and presents results of own works.
Assumptions and objectives of the course: The aim of lectures is to familiarize students with theoretical and practical problems concerning with design, construction, technology of building and exploitation of foundations and supporting structures under machine and with methods of protection of peoples and building against vibration.		
Study outcomes and reference to the educational results for a field of study		
Knowledge: 1. Students have known description of dynamic forces caused by machines and types and attributes of vibroisolators used in civil engineering - [[K_W03]] 2. Students have known principles and standards used in design and manufacturing of typical supporting structures under machines of different types. - [[K_W03]] 3. Students have known principles of anchoring of machines with foundations and have known principles of carry out of block foundations under machines - [[K_W03]]		
Skills: 1. Students are able to design block foundation under machines executing rotational and upstroke ? returning motion - [[K_U004]] 2. Students are able to design supporting structures under machine executing rotational motion (with and without vibroisolators) - [[K_U004]]		
Social competencies: 1. Students are aware of responsibility for results of performed calculation - [[K_K02]] 2. Students are able to describe results of performed calculation and are able to formulate appropriate conclusions - [[K_K02]]		

Assessment methods of study outcomes		
Written tests, valuation of project, written exam		
Course description		
Characteristics of chosen industrial structures. Dynamics characteristic of machines. Principles of determination of dynamic forces. Admissible amplitudes of forced vibration. Characteristics of materials used in machines supporting structures. Dynamics factors of grounds, stiffness factors of grounds. Damping in grounds. General principles of constructing of foundation under machines settled on ground. Types of vibroisolations, theirs assignment and effectiveness. Materials and elements used in vibroisolation. Construction of foundation on vibroisolations.		
Basic bibliography:		
1. Fundamenty pod maszyny. , Lipiński J., Arkady, Warszawa, 1985		
2. Projektowanie wybranych konstrukcji przemysłowych, Włodarczyk W., Kowalski A., Pietrzak K., Wyd. Polit. Warszawskiej, Warszawa, 1995		
Additional bibliography:		
1. Konstrukcje wsporcze pod maszyny, Falkowski J., Wyd. Pol. Koszalińskiej, Koszalin, 1995		
2. Wibroizolacja maszyn i urządzeń, Goliński J., WNT, Warszawa, 1979		
Result of average student's workload		
Activity	Time (working hours)	
1. Participation in lectures	20	
2. Preparation of project	10	
Student's workload		
Source of workload	hours	ECTS
Total workload	125	5
Contact hours	37	1
Practical activities	60	2