



Subject card

Subject name and code	Industrial Construction II, PG_00042233						
Field of study	Civil Engineering						
Date of commencement of studies	February 2023	Academic year of realisation of subject			2023/2024		
Education level	second-cycle studies	Subject group			Optional subject group		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	1	Language of instruction			Polish		
Semester of study	2	ECTS credits			4.0		
Learning profile	general academic profile	Assessment form			exam		
Conducting unit	Department of Building Structures and Material Engineering -> Faculty of Civil and Environmental Engineering						
Name and surname of lecturer (lecturers)	Subject supervisor	prof. dr hab. inż. Andrzej Tejchman-Konarzewski					
	Teachers						
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	30.0	0.0	0.0	30.0	0.0	60
	E-learning hours included: 0.0						
Learning activity and number of study hours	Learning activity	Participation in didactic classes included in study plan	Participation in consultation hours		Self-study		SUM
	Number of study hours	60	5.0		35.0		100
Subject objectives	Make acquaintance of students with dynamic problems in building structures.						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K7_W14] knows and applies building codes and obeys the Construction Law; has knowledge on environmental impact of investment realisation				[SW1] Assessment of factual knowledge		
	[K7_U02] can design and dimension complex steel, concrete (including reinforced), wood and masonry constructions and its details				[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[K7_U12] can calculate and analyse the energy balance of a building				[SU4] Assessment of ability to use methods and tools [SU1] Assessment of task fulfilment		
	[K7_W02] knows principles of analysis, design and dimensioning of complex constructions and its elements				[SW1] Assessment of factual knowledge		
	[K7_W10] knows modern building materials as well as technologies and methods of its manufacturing and production of construction elements				[SW1] Assessment of factual knowledge		

Subject contents	<p>Classification of dynamic loads. Effect of vibrations on structuresm people and machines. Mechanical propeties of building materials. Fatigue and damping of building materials. Compressibility of soils and settlements of building structures. Effect of soil vibrations on structures. Stress waves in elastic medium. Fourier's transformation to analyze the frequency spectrum. Vibrations of systems with many degrees of freedom. Finite element method for dynamic problems. . Approximate methods to solve dynamic motion equations. Machines and their dynamic loads. Foundations under dynamic machines. Vibration of massive foundations. calculation and reinforcement of massive and wall foundations. Frame foundations. Vibro-isolation properties. Calculations of foundations on vibro-isolation materials.</p> <p>Wpływ drgań na otoczenie (konstrukcje budowlane, ludzie, maszyny). Cechy dynamiczne materiałów budowlanych. Zmęczenie i tłumienie w materiałach budowlanych. Ściśliwość gruntów i osiadanie budowli pod wpływem obciążeń dynamicznych. Wpływ drgań gruntowych na konstrukcje. Fale naprężeniowe w ośrodku sprężystym. Transformacja Fouriera do analizy spektrum częstotliwości drgań. Drgania układów dyskretnych o wielu stopniach swobody. Przybliżone metody rozwiązywania równań dynamicznych ruchu. MES w układach dynamicznych. Maszyny i ich obciążenie dynamiczne. Fundamenty pod maszyny. Drgania bloków fundamentowych. Obliczanie i zbrojenie fundamentów blokowych ścianowych. Fundamenty ramowe Własności wibroizolatorów. Obliczanie fundamentów na wibroizolacji.</p>														
Prerequisites and co-requisites															
Assessment methods and criteria	<table border="1" data-bbox="448 875 1498 1010"> <thead> <tr> <th data-bbox="448 875 794 909">Subject passing criteria</th> <th data-bbox="794 875 1141 909">Passing threshold</th> <th data-bbox="1141 875 1498 909">Percentage of the final grade</th> </tr> </thead> <tbody> <tr> <td data-bbox="448 909 794 943">Project</td> <td data-bbox="794 909 1141 943">55.0%</td> <td data-bbox="1141 909 1498 943">10.0%</td> </tr> <tr> <td data-bbox="448 943 794 976">Oral exam</td> <td data-bbox="794 943 1141 976">55.0%</td> <td data-bbox="1141 943 1498 976">70.0%</td> </tr> <tr> <td data-bbox="448 976 794 1010">Writing exam</td> <td data-bbox="794 976 1141 1010">55.0%</td> <td data-bbox="1141 976 1498 1010">20.0%</td> </tr> </tbody> </table>			Subject passing criteria	Passing threshold	Percentage of the final grade	Project	55.0%	10.0%	Oral exam	55.0%	70.0%	Writing exam	55.0%	20.0%
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Oral exam	55.0%	70.0%													
Writing exam	55.0%	20.0%													
Recommended reading	Basic literature	Lectures													
	Supplementary literature	<p>[1] Lipiński, J. <i>Fundamenty i konstrukcje wsporcze pod maszyny</i>. Arkady, Warszawa 1969.</p> <p>[2] Branicki, Cz., Wizmur, M. <i>Metody macierzowe w mechanice budowli i dynamice budowli</i>. Politechnika Gdańska, Gdańsk, 1980.</p> <p>[3] Biernatowski, K. <i>Fundamentowanie</i>. Państwowe Wydawnictwo Naukowe, Warszawa, 1984.</p>													
Example issues/ example questions/ tasks being completed	FE equation in dynamic region.														
Work placement	Not applicable														