



## Subject card

Subject name and code	Building structures and technologies II, PG_00052806						
Field of study	Architecture						
Date of commencement of studies	October 2022	Academic year of realisation of subject			2024/2025		
Education level	first-cycle studies	Subject group			Obligatory subject group in the field of study Subject group related to scientific research in the field of study		
Mode of study	Full-time studies	Mode of delivery			at the university		
Year of study	3	Language of instruction			Polish		
Semester of study	5	ECTS credits			1.0		
Learning profile	general academic profile	Assessment form			assessment		
Conducting unit	Department of Technical Fundamentals of Architecture Design -> Faculty of Architecture						
Name and surname of lecturer (lecturers)	Subject supervisor	dr inż. Karol Grębowski					
	Teachers	dr inż. Karol Grębowski					
Lesson types and methods of instruction	Lesson type	Lecture	Tutorial	Laboratory	Project	Seminar	SUM
	Number of study hours	15.0	0.0	0.0	0.0	0.0	15
	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	15	1.0		9.0		25
Subject objectives	The student recognizes the basic problems in the field of solving problems related to steel and wooden structures. Presents knowledge on the relationship between loads and stresses and deformations in simple building elements made of steel and wooden structures. Explains the principles of dimensioning and determining the load-bearing capacity of simple elements in steel and wooden structures. Designs basic elements of steel and wooden structures (beams, binders, columns and trusses).						
Learning outcomes	Course outcome	Subject outcome			Method of verification		
	[K6_W01] knows and understands construction problems, building and engineering issues related to building design; principles, solutions, constructions and building materials used in simple engineering tasks in the field of architectural and urban design	has knowledge of technical issues related to the design and implementation of architectural facilities and basic knowledge of related engineering industries			[SW3] Assessment of knowledge contained in written work and projects [SW2] Assessment of knowledge contained in presentation		
	[K6_U02] is able to design an architectural object or a simple urban complex that meets the aesthetic and technical requirements	prepares, based on the author's design concept, basic elements of architectural and construction documentation, skillfully applies construction solutions, designs basic construction elements, selects materials and construction products depending on their type and properties			[SU5] Assessment of ability to present the results of task [SU4] Assessment of ability to use methods and tools [SU3] Assessment of ability to use knowledge gained from the subject [SU2] Assessment of ability to analyse information [SU1] Assessment of task fulfilment		

Subject contents	LECTURES: Introductory information, the characteristics of such materials as steel, aluminum, wood in the context of their use in building structures. Advantages and disadvantages of steel and wooden structures. General characteristics of steel construction. Historical outline of metal structures. Steel as a building material. Outline of steel manufacturing technology. Steel grades and mechanical properties. Steel products. Basic relations for the dimensioning of steel structure elements in accordance with the applicable standards: ultimate limit state (tension, bending, compression), limit state of use. General principles of designing full-wall girders - rolled beams, binders - plate girders General principles of designing lattice girders General principles of designing single and multi-span columns. Types of fasteners, rivets, bolts, welds - general principles of connection design. Bracing in steel structures - the role of braces in ensuring the stability of the structure. General characteristics of wooden construction, historical outline. Wood as a building material. Wood species and mechanical properties. General dependencies for the dimensioning of wooden structure elements: ultimate limit state (tension, bending, compression), limit state of use. Joints in wooden structures, types and design principles. General principles of designing full-walled girders, ceiling beams, elements made of glued laminated timber. General principles of designing roof trusses and lattice girders. General principles of designing single and double-branch poles. Protection of steel and wooden structures against corrosion and fire.		
Prerequisites and co-requisites			
Assessment methods and criteria	Subject passing criteria	Passing threshold	Percentage of the final grade
Recommended reading	Basic literature	Eurocode 0: Design of structuresEurocode 1: Actions on structuresEurocode 2: Design of reinforced concrete structuresEurocode 3: Design of steel structuresEurocode 5: Design of wooden structuresEurocode 6: Design of masonry structuresPN-B-01040 Building construction drawing. General rulesHoła J., Pietraszek P., Schabowicz K.: Calculation of traditionally erected buildings, Dolnośląskie Wydawnictwo Edukacyjne, Wrocław 2006.Starosolski W., Reinforced concrete structures, volumes I, II and III, Polish Scientific Publishers PWN, Warsaw 2007.Łapko A.: Designing reinforced concrete structures, Arkady, Warsaw 2001.Łapko A., Jensen B. Ch.: Design basics and algorithms for calculating reinforced concrete structures, Arkady, Warsaw 2005.Knauff M., Calculation of reinforced concrete structures according to Eurocode 2, PWN, Warsaw 2012, 2015;	
	Supplementary literature	1. Borusiewicz W. Building structures for architects, Arkady, Warsaw 1973.2. Mielczarek Z. Modern structures in general construction, Arkady, Warsaw 2001.3. Michalak H. Multi-station garages. Design and implementation, Arkady, Warsaw 2009.	
	eResources addresses	Adresy na platformie eNauczenie:	
Example issues/ example questions/ tasks being completed			
Work placement	Not applicable		