

COURSE DESCRIPTION CARD

Faculty of Civil Engineering and Environmental Sciences								
Field of study	Degree level and programme type							
Specialization/ diploma path	Study profile Academic profile							
Course name	Complex metal structures							Course code IS-FCEE-00173-1S
								Course type Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester summer
	15			30				No. of ECTS credits 4
Entry requirements	General building, Structural mechanics, Strength of materials, Base of designing of the steel structure							
Course objectives	Introduction of students with selected complex steel structures and with their execution. Teaching of design rules of selected complex structures. Education of skills of the efficient using standards and design guidelines.							
Course content	1. Roofs with the big span. Steel space frames roofs. The geometrical shaping. Principles of computing internal forces. Technical solutions. 2. Suspended and tie-bar structures. Types of constructions. Technical solutions. The bases of calculations. 3. Steel chimneys. Types and technical solutions. Loads. The calculation of the shank and anchorages.							
Teaching methods	presentations on lectures, methods of projects							
Assessment method	lecture – written test, project – project completion, presentation and discussion							
Symbol of learning outcome	Learning outcomes						Reference to the learning outcomes for the field of study	
EU1	Student knows and understands in a deepened and extended extent the principles of analysis, construction and dimensioning of elements of selected metal complex structures, with particular regard to steel chimney elements. He/ She can correctly define the calculation model of the chimney and perform advanced analysis in a linear range.						K_B2_W02, K_B2_U05	
EU2	Student knows and understands in extended extent the principles of analysis, design and construction of selected objects in the area of complex metal structures, with particular regard to the chimney. He/ She can design the construction of the chimney.						K_B2_W03, K_B2_U04	

EU3	Student has extended knowledge about currently used products and building elements used in the implementation of chimneys, hanging structures, string constructions, large span crossings and structural crossings.	K_B2_W05
EU4	Students knows and understands in extended scope standard rules as well as regulations and guidelines regarding the design of selected complex structures and their elements, with particular regard to the chimney.	K_B2_W07
EU5	Student can prepare detailed documentation of the chimney design.	K_B2_U10
EU6	Student is ready critically assess his/ her knowledge.	K_B2_K01
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed
EU1	Written test, corrections, discussion, colloquium, project defence.	L, P
EU2	Written test, corrections, discussion, colloquium, project defence.	L, P
EU3	Written test, corrections, colloquium, project defence.	L, P
EU4	Written test, colloquium, project defence.	L, P
EU5	Corrections, discussion, project defence.	P
EU6	Written test, corrections, colloquium, project defence.	L, P
Student workload (in hours)		No. of hours
Calculation	lecture attendance	15
	participation in project classes,	30
	preparation for passing the lecture and presence on it	19
	implementation of project tasks, preparation for project classes and passing the project,	35
	participations in consultations	1
	TOTAL:	100
Quantitative indicators		HOURS
Student workload – activities that require direct teacher participation		No. of ECTS credits
Student workload – practical activities		48
		1,5
		85
		3,0
Basic references	1.Ramaswamy G.S, Eekhout M., Suresh G.R.: Analysis, design and construction of steel space frame. Thomas Telford Publishing , London 2002. 2. S. A. Ashtul, S. N. Patil: Review on Study of Space Frame Structure System. International Research Journal of Engineering and Technology, Volume: 07 Issue: 04 , Apr 2020. 3. EN 1993-1-6. Design of Steel Structures. Part 1-6: Strength and Stability of Shells Structures. 4. EN 1993-3-2 Design of Steel Structures. Part 3-2: Tower, masts and chimneys-Chimneys	

	<p>5.Rykaluk: Konstrukcje stalowe. Kominy, wieże, maszty. Oficyna Wydawnicza Politechniki Wrocławskiej , 2007.</p> <p>6. Mendera Z., Boryczko M.: Warunki nośności i sztywności stalowych powłok walcowych w świetle Eurokodów. Poradnik konstruktora. Inżynieria i Budownictwo nr. 12/2008.</p> <p>7. XXVII Ogólnopolskie warsztaty pracy projektanta konstrukcji, Szczyrk 2012, Nowoczesne rozwiązania konstrukcyjno-materiałowo-technologiczne. Konstrukcje metalowe. Tom I /str.569 – 630/ i III /str. 351 – 380/.</p> <p>8. Tensile stucture, Wikipedia, Strona internetowa. /ew. polskie tłumaczenie/</p>	
Supplementary references	<p>1. Kurzawa Z.: Stalowe konstrukcje prętowe.Cz. II. Struktury przestrzenne, przekrycia ciegnowe, maszty i wieże. Wydawnictwo Politechniki Poznańskiej 2011.</p> <p>2. Cabaj J., Kowal Z.: Przekrycia cięgnowe. Wydawnictwa Politechniki Wrocławskiej, 1977, s.144.</p> <p>3. Bródka J., Kozłowski A., Ligocki I., Łaguna J., Ślęczka L.,: Projektowanie i obliczanie połączeń i węzłów konstrukcji stalowych. Polskie wydawnictwo Techniczne. Tom I, II. Rzeszów, Tom I-2013 /Tom II-2015.</p> <p>4. Space Frames Construction, Arch 436, Contemporary Building Construction Methods, College of architecture and planning. Strona internetowa</p>	
Organisational unit conducting the course	Department of Building Structures and Structural Mechanics	Date of issuing the programme
Author of the programme	Agnieszka Jabłońska-Krysiewicz, PhD, Eng.	20.03.2023

L – lecture, C – classes, LC – laboratory classes, P – project, SW – specialization workshop, FW - field work,

S – seminar