

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	Composite Structures							Course code	IS-FCEE-00096W
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter
	15			30				No. of ECTS credits	4
Entry requirements	Basics of Concrete Structures Design, Basics of Steel Structures Design, Structural Mechanics, General Building Engineering								
Course objectives	The purpose of education is to prepare students to participate in the procedures of design of composite slabs, composite beams and columns and acquisition of skills in optimization of composite structures of multistorey buildings								
Course content	Composite Structure. Materials. Structural analysis. Methods of global analysis. Classification of cross section .Resistances of cross section of beam: plastic bending resistance, non-linear resistance to bending, elastic resistance to bending. Resistance to vertical shear, lateral-torsional buckling of composite beams. Shear connection: Longitudinal shear force in beams for buildings, Headed stud connectors in solid slabs and concrete encasement, Design resistance of headed studs used with profiled steel sheeting in building, Longitudinal shear in concrete slabs. Composite slabs with profiled steel sheeting for buildings. Composite columns and composite compression members. Composite joints in frames for buildings: analysis, modelling and classification, design methods, resistance of components. Serviceability limit states for beams: Stress, Deformations in buildings, Cracking of concrete.								
Teaching methods	presentations on lectures, methods of projects								
Assessment method	lecture – written exam, project – project completion, presentation and discussion								
Symbol of learning outcome	Learning outcomes							Reference to the learning outcomes for the field of study	
L01	Student (graduate) has identified and described the main elements of composite structures.							K_B1_W05	
L02	Student (graduate) has knowledge about modelling of main elements of composite structures (slabs, beams and columns)							K_B1_W03 K_B1_W05 K_B1_U06 K_B1_U08	
L03	Student (graduate) can design of composite structures according to European Standards							K_B1_W06 K_B1_U08	

L04	Student (graduate) can prepare structural drawings of composite structures	K_B1_U03	
L05	Students (graduate) can benefit standards and other sources of information	K_B1_K01	
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	Evaluating the student's project (descriptive part) , written exam on lecture content,	L, P	
L02	Evaluating the student's project (descriptive part, computing and drawing), written exam on lecture content,	L, P	
L03	Evaluating the student's project (computing and drawing parts), completion of the project	P	
L04	Evaluating the student's project (drawing part), completion of the project	P	
L05	Evaluating the student's project (descriptive and computing parts), completion and discussion of the project	P	
Student workload (in hours)		No. of hours	
Calculation	lecture attendance	15	
	participation in project classes,	30	
	preparation for classes, projects,	15	
	working on projects	30	
	preparation for and participation in exams/tests	15	
	participation in student-teacher sessions related to the classes/s	5	
	TOTAL:	110	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		52	2
Student workload – practical activities		95	3,5
Basic references	1. EN 1992-1-1 Design of concrete structures 1-1 General rules and rules for buildings 2. EN 1993-1-1 Design of steel structures 1-1 General rules and rules for buildings 3. EN 1994-1-1 Design of composite steel and concrete structures Part 1-1 General rules and rules for buildings 4. Johnson, R.P.:Composite Structures of Steel and Concrete - Beams, Slabs, Columns, and Frames for Buildings ,Blackwell Publishing, Oxford 2017.		
Supplementary references	1. Lawson R.M.: Design of composite slabs and beams with steel decking, SCI Publications, 1993 2. Labocha S.: Konstrukcje zespolone stalowo – betonowe, Arkady, Warszawa 2007,		
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