

COURSE DESCRIPTION CARD – SPECIMEN

Faculty of Civil Engineering and Environmental Sciences									
Field of study								Degree level and programme type	
Specialization/ diploma path								Study profile	academic profile
Course name	Heating systems							Course code	FCEE-00077W
								Course type	
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	Fluid mechanics, heat transfer, thermodynamics								
Course objectives	Knowledge about types of heating systems and their elements. Ability to calculate heat losses and power of radiators. Knowledge about radiator types, their advantages and disadvantages. Ability to create a heating system design. Skills to choose dimensions of pipes and sizes of regulation valves.								
Course content	<u>Lecture:</u> Heat losses calculations. Types of radiators. Schemas of heating systems. Advantages and disadvantages of selected HVAC systems. Main elements of heating installations. <u>Project:</u> Calculations of heat losses and power of radiators. Selection of radiators. Selection of heating system type and pipe connections and dimension of pipes. Regulation in HVAC systems.								
Teaching methods	multimedia presentation (lectures), design of a heating system (project)								
Assessment method	e.g.: lecture – 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 has an elementary knowledge of the materials used in central heating (pipes, radiators etc.)								
L02	Student knows the rules of technical drawing necessary for reading and writing architectural data needed for the heating system design, as well as knows the rules for making a sanitary drawing using CAD								
L03	Student knows standards, specific rules and law connected with calculations of heat losses, creating a heating system design and the necessary selection of system elements (radiators, pipes, valves, boilers).								

L04	Student is able to obtain information from the literature and databases about different types of heaters, radiators, installations etc. Student can compare knowledge from different sources, interpret data, make conclusions, formulate and justify own opinions.		
L05	Student is able to work individually and in a team during the laboratory course and can estimate the time needed for the study.		
L06	Student can make the heating installation design, prepare the technical description and explain the scope of the project.		
Symbol of learning outcome	Methods of assessing the learning outcomes	Type of tuition during which the outcome is assessed	
L01	evaluating the student's reports, exam, design presentation	L, P	
L02	design form	P	
L03	design form and presentation, exam	P, L	
L04	exam, design form and presentation	L, P	
L05	evaluating the student's work	P	
L06	discussion of the student's design	P	
Calculation	lecture attendance	15	
	participation in classes,	30	
	preparation for classes,	30	
	working on projects	45	
	implementation of project tasks	20	
	TOTAL:	140	
Quantitative indicators		HOURS	No. of ECTS credits
Student workload – activities that require direct teacher participation		45	1,8
Student workload – practical activities		125	5
Basic references	1. Krawczyk D.A. (Ed.) Buildings 2020+.Architecture, Constructions and Installations. Publishing House of BUT, Białystok 2019. 2. David E. Watkins- Heating services in buildings : design, installation, commissioning a. maintenance / Chichester : Wiley-Blackwell, 2011. 3. DeVore, Russell B. Practical problems in mathematics for heating and cooling technicians. Clifton Park : Delmar Cengage Learning, 2013		
Supplementary references	Chiras, Daniel D. The solar house : passive heating and cooling.White River Junction : Chelsea Green Publishing Company, 2002.		
Organisational unit conducting the course	Heating, Ventilation, Air Conditioning Department	Date of issuing the programme	
Author of the programme	Assoc. Prof. Dorota Anna Krawczyk, DSc, PhD, Eng.	12.2019	

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