

## 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	Air conditioning and ventilation systems 2							Course code	FCEE-00107W
								Course type	Erasmus
Forms and number of hours of tuition	L	C	LC	P	SW	FW	S	Semester	winter
	30			30				No. of ECTS credits	5
Entry requirements	Fluid mechanics, heat transfer, thermodynamics								
Course objectives	Advance knowledge about types of heating systems and their elements. Ability to calculate heat losses and power of radiators and pipes selection. 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 and hydraulic 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	
LO1	Student has an elementary knowledge of the materials used in ventilation and air-conditioning (dusts, units etc.)								
LO2	Student knows the rules of technical drawing necessary for reading and writing architectural data needed for system designs, as well as knows the rules for making a sanitary drawing using CAD								
LO3	Student knows standards, specific rules and law connected with calculations of cool load and ventilation air flow, system designs and selection of necessary elements of a system								

L04	Student is able to obtain information from the literature, databases about different types 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 installation design, prepare the technical description and explain the scope of the project.	
<b>Symbol of learning outcome</b>	<b>Methods of assessing the learning outcomes</b>	<b>Type of tuition during which the outcome is assessed</b>
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
<b>Student workload (in hours)</b>		discussion of the student's design
<b>Calculation</b>	lecture attendance	15
	participation in classes,	30
	preparation for classes,	30
	working on projects	45
	implementation of project tasks	20
	<b>TOTAL:</b>	<b>140</b>
<b>Quantitative indicators</b>		<b>HOURS</b> <b>No. of ECTS credits</b>
<b>Student workload – activities that require direct teacher participation</b>		<b>45</b> <b>1,8</b>
<b>Student workload – practical activities</b>		<b>125</b> <b>5</b>
<b>Basic references</b>	Krawczyk D.A. (Ed.) Buildings 2020+.Architecture, Constructions and Installations. Publishing House of BUT, Bialystok 2019. Refrigeration and air conditioning technology / William C. Whitman [et al.]. Delmar Publ. ; Andover : Cengage Learning, 2013.	
<b>Supplementary references</b>	HANDBOOK OF AIR CONDITIONING AND REFRIGERATION Shan K. Wan, 2001, The McGraw-Hill Companies (PDF available at <a href="http://www.gmpua.com">http://www.gmpua.com</a> )	
<b>Organisational unit conducting the course</b>	Heating, Ventilation, Air Conditioning Department	<b>Date of issuing the programme</b>
<b>Author of the programme</b>	Assoc. Prof. Dorota Anna Krawczyk, DSc, PhD, Eng.	<b>12.2019</b>

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