

COURSE DESCRIPTION CARD			
The name of the course/module			Code
BUILDING INSTALLATIONS-HEATING AND VENTILATION SYSTEMS			A_P_1.4_009
Main field of study	Educational profile (general academic, practical)		Year/ term
ARCHITECTURE	general academic		II/4
Specialization	Language of course:	Course (core, elective)	
-	Polish	core	
Hours:	Number of points		
Lectures : Classes: Laboratory classes: Projects / seminars:	15		1
Level of qualification:	Form of studies (full-time studies/part-time studies)	Educational area(s)	ECTS distribution (number and %)
I	Full-time studies and part-time studies	Technical Sciences	1 100%
Course status in the studies' program (basic, directional, other)		(general academic, from a different major)	
basic			
Lecturer responsible for course/lecturer:		Lecturer:	
dr inż. Władysław Organista		dr inż. Władysław Organista	
Faculty of Architecture		Faculty of Architecture	
ul. Nieszawska 13C, 61-021 Poznań		ul. Nieszawska 13C, 61-021 Poznań	
tel. 61 665 32 60		tel. 61 665 32 60	
Prerequisites defined in terms of knowledge, skills, social competences:			
1	Knowledge:	<ul style="list-style-type: none"> ▪ student has explicit, theoretically based knowledge including the key issues of building physics, ▪ student knows the basic methods, techniques and materials used at solving simple engineering tasks in the scope of building physics, ▪ student has knowledge of development trends in the scope of the energy-saving and passive building engineering, 	
2	Skills:	<ul style="list-style-type: none"> ▪ student can acquire information from field specific literature, data bases and other properly selected sources in Polish and English, can integrate the acquired information, interpret the said information, as well as draw conclusions and come up with opinions supported with satisfactory reasons, ▪ student can communicate using different techniques in the professional environment and in other environments, ▪ student can use IT techniques respectively to the performance of tasks typical for engineering activities, 	
3	Social competences:	<ul style="list-style-type: none"> ▪ student understands the need for lifelong learning; can inspire and organize process of learning other people, ▪ student is aware of the importance of non-technical aspects and effects of engineering activities, in this impact upon the environment and liability for environment affecting decisions, ▪ student can work and can cooperate in a team, assuming a number of different roles therein. 	
Objective of the course:			
<ul style="list-style-type: none"> ▪ presentation of the latest knowledge in the scope of heating systems, ventilation and air conditioning in housing and industrial facilities, ▪ improving the ability to design skills, ▪ presentation of the calculation method of thermal power demand of premises and buildings and thermal-hydraulic and hydraulic calculations related to ventilation and air conditioning. 			
Learning outcomes			
Knowledge:			
W01	has proper knowledge in the field of mathematics useful for the formulation of architectural and structural designing related tasks and useful for the solutions of such tasks	AU1_W08	
W02	has basic knowledge of useful lives of structural facilities and their technical infrastructure systems	AU1_W22	
Skills:			

U01	can make calculations in the area of physics and and utility systems, can prepare specification of materials	AU1_U12
U02	can design heating, ventilation, air-conditioning	AU1_U19
Social competences:		
K01	can work over a set task independently and can cooperate in a team, assuming a number of different roles therein; demonstrates responsibility in the work performance	AU1_K01
K02	can think and act in an entrepreneurial, creative and innovative manner	AU1_K07
The evaluation methods:		
<p>During classes student gets plan of building facility and student has to design heating system for that facility. The teacher determines additional technical data for each plan of building: climate zone, type of heating system, type of used material for heat piping, type of heaters, type of fuels for heating the boilers. The basis of classes credit is checking the correctness of performance of heating system project with all technical elements and its defense.</p> <p>Positive grade for module depends on achieved by student all learning outcomes specified in the syllabus.</p>		
Course contents		
<p>Under the educational program student need to:</p> <ul style="list-style-type: none"> ▪ mastering the design skills of heating system and others (ventilation, air-conditioning systems), ▪ learning the used heating, ventilation, air-conditioning systems according to schemas, ▪ learning the calculation method used in heating, ventilation, air-conditioning systems, ▪ learning the new trends in designing the energy-saving and passive buildings. 		
Basic bibliography		
<ol style="list-style-type: none"> 1. Koczyk H. , i inni. Ogrzewnictwo praktyczne, projektowanie, montaż, certyfikacja energetyczna, eksploatacja. Wydanie II , Wyd. Systherm Serwis Poznań 2009. 2. Krygier K. , i inni. Ogrzewnictwo. Wentylacja. Klimatyzacja. Wyd. WSiP. Warszawa 1997. 3. Gaziński B. Technika Klimatyzacyjna dla praktyków, komfort cieplny, zasady obliczeń i urządzenia. Wyd. Systherm Serwis Poznań 2005. 4. Mürmann H. Wentylacja mieszkań. Wentylacja regulowana z odzyskiem ciepła. Wyd. Instalator Polski Warszawa 2001. 5. PN – EN ISO 6946 Komponenty budowlane i elementy budynku. Opór cieplny i współczynnik przenikania ciepła. Metoda obliczania. 6. PN – EN 12831 Instalacje grzewcze w budynkach. Metody obliczania projektowego obciążenia cieplnego. 7. PN – EN ISO 13790 Ciepne właściwości użytkowe budynków. Obliczenie energii cieplnej do ogrzewania. 		
Supplementary bibliography		
<ol style="list-style-type: none"> 1. Nantka M. Ogrzewnictwo i ciepłownictwo. Tom I i II. Wydawnictwo Politechniki Śląskiej Gliwice 2006. 2. Recknagel, Sprenger i inni. Ogrzewanie i klimatyzacja. Poradnik. Wyd. EWF E Gdańsk 2008. 3. Gutkowski K. Chłodnictwo i klimatyzacja. Wyd. N–T Warszawa 2003 		
The student workload		
Form of activity	Hours	ECTS
Overall expenditure	30	1
Classes requiring an individual contact with teacher	22,5	1
Practical classes	15	-

Balance the workload of the average student

Form of activity	Number of hours
participation in lectures	0 h
participation in classes/ laboratory classes (projects)	15 h
preparation for classes/ laboratory classes	15 x 0,5 h = 7,5 h
preparation to colloquium/review	0 h

participation in consultation related to realization of learning process	15 x 0,5 h = 7,5 h
preparation to the exam	0 h
attendance at exam	0 h

Overall expenditure of student:

1 ECTS credit

30 h

As part of this specified student workload

- activities that require direct participation of teachers:

15 h + 7,5 h = 22,5 h

1 ECTS credit